ICAR-CIPHET NEWS

Volume 1 I Issue 1 I Jan-March 2025

ICAR-Central Institute of Post-Harvest Engineering and Technology

(An ISO 9001:2015 Certified Institute)

भाकृअनुप-सीफेट
ICAR-CIPHET

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ICAR-CIPHET News 25:1, Jan-Mar 2025

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From the Director's Desk

Dear Stakeholder,

It is with immense pleasure and responsibility that I present the first quarterly report of ICAR-CIPHET for the year 2025, which encapsulates our ongoing efforts to transform the agricultural processing landscape through innovation, research, and education. As we continue to pursue our mission of enhancing food processing and value addition technologies and reducing post-harvest losses, we are deeply committed to improving the livelihoods of farmers, entrepreneurs, and stakeholders in the agribusiness sector.

This quarter, ICAR-CIPHET has made notable advancements in the development and deployment of innovative technologies aimed at addressing some pressing challenges in post-harvest management and food processing. Our institution has also focused on extensive knowledge dissemination through well-structured training programs and specialized lectures. These initiatives are designed to build capacity among a diverse range of stakeholders, including farmers, food technologists, food engineers and entrepreneurs. By equipping them with advanced technical skills and insights into modern agri-tech solutions, we aim to foster a more robust and resilient food processing ecosystem. In parallel with these efforts, we continue to prioritize intellectual property rights (IPR), with a focus on protecting and commercializing the intellectual capital generated at ICAR-CIPHET. The institution has made significant progress in patent filings, which will ensure that our innovations are not only safeguarded but can also be scaled to benefit a wider community. By facilitating the translation of research into commercially viable technologies, we are paving the way for greater industry collaboration and rural entrepreneurship.

As we look forward to the next quarter, ICAR-CIPHET remains steadfast in its commitment to driving innovation, promoting sustainable practices, and building the capacity needed to meet the challenges of the evolving agricultural landscape. We are confident that our continued efforts will have a lasting impact on the agricultural value chain, contributing to food security, rural prosperity, and economic growth.

(Nachiket Kotwaliwale)
Director, ICAR-CIPHET

Ludhiana, 2025

Research Highlights

ICAR-CIPHET

❖ ***Employment of MAP for shelf-life extension of rose using different packaging materials***

Modified Atmosphere Packaging (MAP) was utilized to extend the shelf life and maintain the quality of *Rosa damascena* (DesiGulab) flowers. Flowers were sorted, trimmed, and packaged in MAP pouches made of Polypropylene (PP), Polyethylene Terephthalate(PET), and Low-Density Polyethylene (LDPE). These were stored at ambient (24°C) and cold (4°C) conditions. The respiration rate of the flowers was modeled using Michaelis-Menten kinetics, stabilizing oxygen at 4% and carbon dioxide at 5% within the packages.

The packaging films exhibited distinct properties:

- **O_2 transmission rates**: LDPE (786.53 cm^3/m^2•24h•0.1MPa), PP (1738.65 cm^3/m^2•24h•0.1MPa), PET (0.651 cm^3/m^2•24h•0.1MPa)
- **CO_2 transmission rates**: LDPE (3200 cm^3/m^2•24h•0.1MPa), PP (4166 cm^3/m^2•24h•0.1MPa), PET (30.073 cm^3/m^2•24h•0.1MPa)
- Film thickness: PP (32.8 µm), LDPE (102.5 µm), PET (110.5 µm)

PET demonstrated superior performance in minimizing weight loss, preserving petal flexibility, and delaying rigidity. It retained a higher flower weight (7.5 g by day 10) compared to PP (6 g) and LDPE (5.5 g). PET also maintained better color (L=46.09, a=15.32, b=14.47) and texture properties (95 g peak deformation force after 20 days). MAP in PET reduced oxygen levels to 1.8% and increased CO_2 to 9.08% over 21 days, effectively minimizing respiration and decay. The fuzzy logic analysis confirmed PET's strong correlation (0.91 fuzzy scores) with sensory quality preservation, making it the most effective material for extending flower freshness and quality.

❖ ***Process protocol for vacuum frying of lotus stem chips in the developed vacuum fryer***

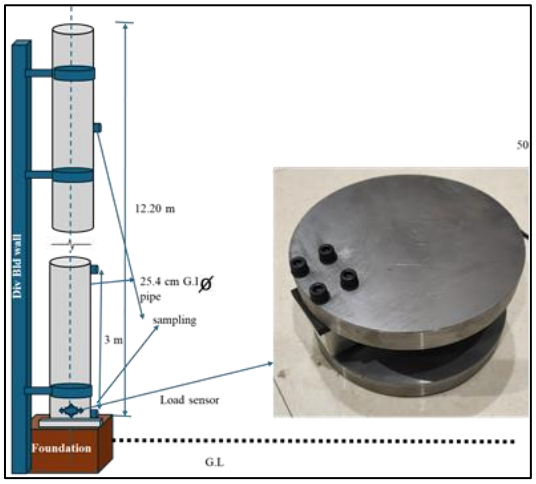
Vacuum frying is a healthier alternative to the traditional deep frying process because it uses less oil, preserves nutritional contents, and reduces the formulation of harmful substances such as acrylamide. Keeping these advantages in mind, ICAR-CIPHET developed a vacuum fryer for frying high-value commodities. This study evaluated the impact of frying temperature and time on the quality of lotus stem chips, focusing on parameters such as moisture loss, oil content, color, texture, and sensory attributes under vacuum frying conditions. Uniform-sized lotus stems (2.21 mm in thickness) were washed, peeled, and soaked in a 1% citric acid solution to prevent browning. After removing excess

moisture with a vegetable spinner and freezing at -20°C for 1 hour, the samples were fried at temperatures ranging from 85–105°C for 17–25 minutes under a constant vacuum of 7.99 kPa. The optimized conditions for vacuum frying were determined to be 95°C for 21 minutes, which produced chips with a moisture content of 6.8%, fat content of 20.16%, a color (L value) of 46.74, hardness of 805.23 g, and an overall sensory acceptability score of 8.55. The study concluded that vacuum frying at these optimized conditions yields lotus stem chips with superior quality in terms of texture, color, oil content, and sensory attributes, making it a preferable method over traditional frying.

Vaccum fried Lotus stem chips

- ***Development of simulated grain silo conditions facility for pulses***

Under the DoCA project, a facility has been proposed to simulate grain silo conditions for pulses, to optimize grain depth. Unlike monocot crops such as wheat and rice, pulses (dicot seeds) are more susceptible to structural damage under pressure. However, existing bulk storage practices for pulses are largely based on those used for wheat and paddy, which may not be optimal. The fabricated load cell sensor has been incorporated into the project to measure: Static Pressure or Weight. The pressure is exerted by the mass of stored pulses at the bottom layer. Dynamic Loading is the additional pressure during the filling process in bulk storage. Therefore, simulated grain silo to accommodate these requirements, a customized load sensor has been developed and fabricated with the following specifications: Size: 8 inches, bearing Capacity: 1 ton, Integration: designed to fit within a 10-inch diameter pipe, representing a simulated silo with a height of 40 feet for storage experiments. This research will help in understanding the impact of grain depth on pulse storage and optimizing it for bulk storage to minimize structural damage to pulses.



Simulated grain silo for optimizing grain depth

- ***Development of functional coating for preservation of minimally processed fruits and vegetables***

Minimally processed fruits and vegetables are ready-to-eat or easy to prepare, saving time and effort. However, the minimal processing can reduce the shelf-life of the fruits and vegetables due to the increased rate of respiration and enzymatic actions. Therefore, an experiment has been conducted using gum-based coating for the preservation of the shelf-life of minimally processed kinnow segments. The minimally processed kinnow segments were coated with different gums (carboxymethyl cellulose (CMC), pectin, acacia, and xanthan gum) in different concentrations. Among different gum formulations, 0.25% xanthan gum with 75% aloe vera gel forms a stable coating mixture that results in desired viscosity for coating application. Xanthan gum also resulted in reduced microbial load on stored kinnow segments, but it slightly affected its sensory quality at the end of storage.Kinnow segments coated with aloe vera and gum-based coating were highly acceptable for upto 6 days of storage without much change in their sensory quality compared to fresh ones.

- ***Development of image (Visual and X-Ray) based mango sorting & grading system and sensor-based monitoring system with blockchain technology for supply chain of banana***

Data analysis was carried out to check the accuracy of the machine vision system. Results obtained through the machine vision system were compared with physical measurements done using Vernier caliper to estimate the length and width of mango varieties. High accuracy level was observed for the Kesar and Neelam variety.Length and width accuracy were found as 98.09% and 98.29%, respectively for Kesar, whereas length and width accuracy were observed as 99.65% for 99.85% respectively for the Neelam variety. A high accuracy level indicates the machine vision system's good reliability for the prediction of mango size.

- ***Development of process for roasted brown rice infused green tea***

Green tea is a popular beverage that is widely consumed around the world, particularly in Asian and European countries. Prior research has indicated that tea drinking reduces the risks of cancer, cardiovascular disease, hyperlipidemia, diabetes, and obesity. In Japan, the 'Genmaicha' a green tea infused with brown rice is popular due to its health benefits. But in the Indian scenario, such kind of tea is not available. Although imported tea brands are being marketed. Considering this in view, in this study an attempt has been made to develop a process for optimization of green tea infused with roasted brown rice. The locally available green tea and brown rice (*Sonamasuri*variety) were procured for the preparation of brown rice-infused green tea. The tea was made in two steps. Firstly, to optimize roasting time and temperature for achieving desired texture and colour in brown rice and secondly, selecting an appropriate ratio of roasted brown rice and green tea for making the sensory acceptable tea samples. The brown rice was roasted by using the dry pan roasting method at different temperatures (140 to 200°C) and time intervals (1 to 4 minutes). The data was statistically analyzed using a Completely Randomized Design (CRD) design. The results demonstrated that optimal roasting conditions significantly enhanced the flavor and texture of brown rice while preserving its nutritional integrity. The optimized roasted brown rice (175^{o}C for 3 to 4min) and green tea based on sensory evaluation the infused tea samples are formulated for making different combinations in tea bags (sample size 2 grams) as roasted brown rice: green tea in the ratio of 1:1, 1.2:1, and 1.5:1. The formulated infused tea along with control samples was then analyzed for different physio-chemical parameters.

The proximate analysis of various green tea compositions revealed moisture (3.32-3.89%), crude protein (8.15-9.05%), fat (2.06-3.53%), and ash (2.66-3.48%). In comparison, Genmaicha tea

contained 3.21% moisture, 6.05% protein, 2.75% fat, and 1.68% ash, while roasted brown rice had significantly lower values: 1.06% moisture, 4.95% protein, 3.11% fat, and 1.49% ash. The bioactive compound analysis showed that green tea exhibited high levels of caffeine (2.92-7.55 mg/g), total phenolic content (TPC, 10.67-18.31 mg/g), total flavonoid content (TFC, 1514-2800 mg/g), and vitamin C (83.33-94.44 mg/100ml). In contrast, Genmaicha had lower or comparable levels of caffeine (1.73 mg/g), TPC (12.56 mg/g), TFC (845.70 mg/g), and vitamin C (88.89 mg/100ml), while roasted brown rice showed minimal bioactive content. Antioxidant activity was strongest in green tea, with FRAP values of 4.16-4.65 mg/g and DPPH scavenging activity of 94-96%. Genmaicha tea displayed moderate activity (FRAP: 3.89 mg/g, DPPH: 96.62%), whereas roasted brown rice had significantly lower values (FRAP: 1.68 mg/g, DPPH: 18.78%). The high antioxidant potential in green tea is attributed to catechins, potent antioxidants that mitigate oxidative stress and cellular damage. Among the analyzed samples, green tea with a 1.2:1 composition exhibited the best results, demonstrating superior bioactive potential and composition. GC-MS analysis of green tea samples confirmed the presence of caffeine and different benzene derivatives such as benzenepropanoic acid, benzeneacetic acid, 1, 2-benzenedicarboxylic acid, 1,3-Cyclopentadiene.

Brown rice (Sonamasuri variety)

b) Dry pan roasting of brown rice

c) Roasted brown rice

d) Mixture of roasted brown rice and green tea

e) Prepared roasted brown rice green tea bags

❖ Development of a hand-held device for non-destructive quality evaluation of mango

Traditional quality evaluation methods generally depend on destructive biochemical analyses, which are time-consuming and lead to fruit damage. Non-destructive quality evaluation methods offer a more efficient and rapid approach. Therefore, to determine the quality of mangoes a hand-held device has been developed in collaboration with ICAR-IARI, New Delhi. The device is used to acquire, process, and predict the quality of mangoes in terms of providing the values of total soluble solids, titratable acidity, dry matter, and maturity index. The device has been used to evaluate the quality of mangoes during different harvesting stages and storage. The conceptual design of the device was based on the

NIR models/ patent developed by ICAR-CIPHET, Ludhiana. The hand-held device was developed with a 3-D printed plastic body consisting of a tungsten halogen lamp as a light source, a NIR sensor, a single port computer, and batteries. The device was used to acquirethe spectral data of different mango varieties including Lagra, Dassehri, Bangan Palli, Neelam, and Chausacollected from different mango-growing states of India. The developed device was also used to predict the quality of apples and pear fruits.

AICRP on PHET

- ***Rotary Dryer cum Flavor Coating Machine for Production of Coconut Chips***

A rotary dryer cum flavor coating machine was developed by CPCRI, Kasargod to improve the production of coconut chips, addressing the inefficiencies of traditional methods. Traditional dehydration is slow, energy-intensive, and lacks simultaneous flavoring capabilities, which limits product quality and market appeal.

Key Features:

- **Machine specification:** A stainless steel rotary drum (7 kg capacity), powered by a 0.5 hp motor, with a 1kW heating coil supplying hot air at 0.1 m/s.
- **Optimized conditions:** The drying and flavoring of coconut chips were achieved at 130°C for 20 minutes, ensuring consistent product quality.
- **Batch capacity:** Processes 5–7 kg of coconut slices per batch, yielding 5 kg of flavored chips in 2 hours.
- **Flavor coating:** Applies colors and flavors (e.g., salted, spicy, or customized options) simultaneously during dehydration, enhancing product appeal.

Benefits:

- **Reduced drying time:**Reduced the drying time by 50% (from 6 hrs in the conventional method to 2 hrs).
- **Energy efficacy:**The developed machine was faster and more economical as it reduced the energy consumption from 4 kW to 1 kW and produced high-quality coconut chips.

This innovative design offers a sustainable, cost-effective solution for small- and medium-scale processors, significantly reducing drying time and energy use while enhancing product quality and market competitiveness.

Rotary Dryer for drying and flavour coating of coconut chips

❖ ***Solar and biomass hybrid Jaggery manufacturing unit for production of solid and granular form of jaggery***

A biomass gasifier-based systemwas developed by RARS, Anakapallewith a capacity of 2,00,000 kcal/h was developed to enhance the efficiency and sustainability of jaggery production, addressing the limitations of traditional open boiling methods, which are time-consuming, energy-intensive, and unhygienic.

Key Features:

- **Biomass gasifier**: Utilizes bagasse as fuel, improving energy efficiency and reducing dependency on conventional fuels.
- **Solar-powered crusher**: A 7.5 HP four-roller sugarcane crusher powered by 28 solar PV panels (335 Wp each), contributing to energy conservation and sustainability.
- **Processing capacity**: Handles 360 kg of sugarcane per cycle to produce high-quality jaggery.

Benefits:

- **Reduced production time**: Enhances process efficiency for large-scale jaggery production.
- **Energy savings**: Combines solar energy and biomass utilization for a cost-effective and environmentally friendly solution.
- **Sustainability**: Promotes clean energy use, reducing the carbon footprint of jaggery production.
- **Support for rural farmers**: Provides an efficient, hygienic technology for value addition, benefiting rural sugarcane farmers economically and environmentally.

This integrated system significantly lowers production time and energy consumption while ensuringhigh-quality output, and making jaggery productionmore sustainable and economical.

Preparation of solid jaggery through biomass gasifier

Solid jaggery prepared from biomass gasifier system

❖ ***Development of automatic paddy straw-based mushroom production and processing plant***

A mechanized crumpled straw compaction unit was developed by OUAT, Bhubaneshwar to improve the efficiency and consistency of mushroom bed preparation, addressing the limitations of traditional manual methods, which are labor-intensive, inconsistent, and time-consuming.

Key Features:

- **IoT Integration**: Enables remote monitoring and control of the linear accelerator, enhancing operational convenience.
- **Load Cell with Display Unit**: Precisely measures and adjusts the pressure for optimal bed preparation.

- **Automated Operation**: Compresses straw to the required pressure and automatically reverses upon completion, eliminating manual intervention.
- **Adjustable Pressure Levels**: Accommodates different mushroom bed specifications by adjusting compaction pressure as needed.

Performance and Benefits:

- **Processing Capacity**: Handles 20–25 kg of straw per hour, suitable for small to medium-scale operations.
- **Labour Efficiency**: Reduces manual labour requirements by up to 70%.
- **Cost-Effectiveness**: Offers a return on investment within two cropping cycles due to reduced labour costs and increased productivity.
- **Uniformity**: Ensures consistent bed compaction, improving mushroom growth and yield.

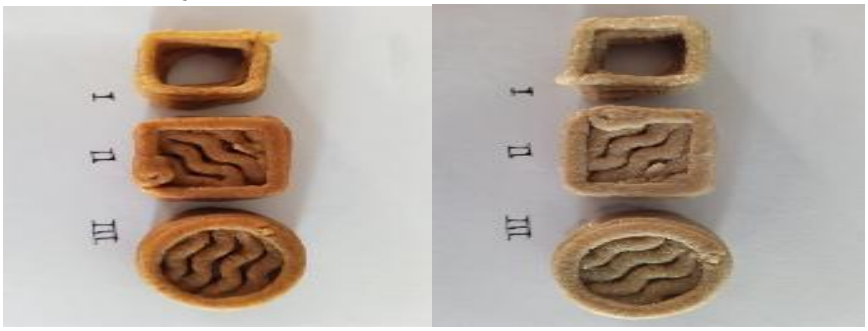
This advanced, cost-effective compaction unit streamlines mushroom bed preparation, making it a sustainable and efficient solution for mushroom farmers.

IoT enabled Crumpled straw compaction unit

❖ ***Development of Process technology for preparation of meat analogue from oyster mushroom***

With the increasing global demand for sustainable and plant-based protein sources, mock meat products have emerged as a promising alternative to traditional animal-based meat. However, achieving the desired texture, taste, and nutritional value remains a challenge in the food industry. Therefore, the current study carried out by OUAT, Bhubaneshwar aimed to develop a nutritionally balanced, cost-effective, and well-structured mock meat product using advanced 3D printing technology, leveraging the unique properties of gluten, soya flour, and mushroom powder. The formulation for mock meat was carefully optimized using a combination of 20% gluten, 60% soya flour, and 20% oyster mushroom powder. A powder-to-water ratio of 5:4 was used to prepare the dough, ensuring the right consistency for 3D printing. The prepared dough was loaded into a food-grade 3D printer, where it was extruded into well-defined layers to achieve a meat-like texture and appearance. The nutritional composition of the final product is as follows (per 100g): Protein: 30g (rich in plant-based protein from soya and

gluten), Fiber: 6g (from mushroom powder), Fat: 2g (low-fat product), Carbohydrates: 12g (contributing to energy content), Vitamins and Minerals: Significant levels of iron, magnesium, and B vitamins from mushroom powder. The total production cost of the mock meat is estimated at ₹250 per kilogram, making it affordable for large-scale production while maintaining high nutritional quality. The utilization of readily available plant-based ingredients and efficient 3D printing techniques further enhances its economic feasibility.



3-D printed sample Samples after cooking

❖ ***Development and Commercialization of Spicy Coconut Chips as a Savory Snack***

Sweet coconut chips are popular across India, but there is a growing demand for innovative, savory snack options among consumers. Entrepreneurs and food processing units have expressed significant interest in developing spicy coconut chips, seeing potential in diversifying the product range to cater to changing market preferences. This demand necessitated the optimization of a processing protocol to ensure consistent quality and acceptability of the product. A standardized technology for producing spicy coconut chips was developed using carefully selected spice powder and salt combinations was developed by CPCRI, Kasargod. The process utilized 10-month-old matured coconut kernels, which were sliced to an optimal thickness of 0.5 mm. These slices were coated with spice blends and dehydrated using a rotary dryer until the moisture content was reduced to less than 2%. The chips were then roasted to achieve a crispy texture and robust flavor profile. This innovative approach ensures the chips retain their natural coconut aroma while delivering a bold, spicy taste. Adaptive trials were conducted in collaboration with two enterprises, M/s. GJ Foods, Kerala, and M/s. Bless Farm Flave, Kasargod, Kerala. The trials demonstrated excellent consumer acceptance, confirming the product's feasibility for large-scale commercialization. The production process is cost-effective, leveraging locally available coconuts and simple machinery, ensuring minimal wastage and high profitability. Spicy coconut chips present a lucrative opportunity for entrepreneurs to tap into the growing savory snack segment, both domestically and internationally. The successful standardization of spicy coconut chips offers a unique and market-ready product. Its potential for scalability ensures significant economic benefits, making it a promising addition to the savory snack industry.

Spicy Coconut chips

❖ ***Motor operated oyster mushroom shredder***

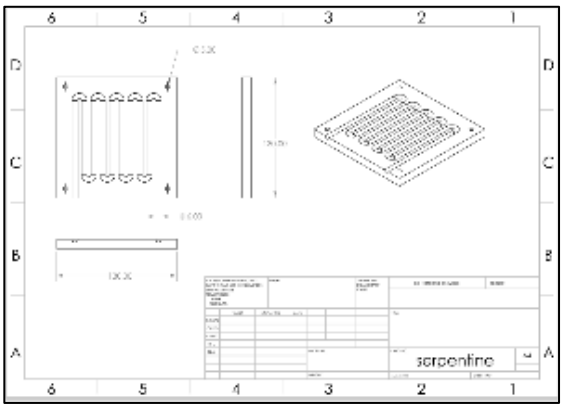
A motor operated oyster mushroom shredder has been fabricated by OUAT, BhubaneswarShredding of mushroom is required prior to drying which is a labour intensive work. It can process 100 kg oyster mushroom per hour. The capacity of machine is 100 kg/h&Cost: Rs. 20,000/-.

Oyster mushroom shredder

❖ ***Development of sucrose free chocolate using cooling bed assisted 3D printer***

Sucrose free chocolate was developed by IIT, Kharagpurusing cooling bed assisted 3D printer. Maintaining an optimal temperature during 3D chocolate printing is essential for producing high-quality prints and preventing structural issues. The thermo-rheological properties of chocolate play a key role in printability, requiring precise control of cooling conditions. A literature review highlighted the importance of keeping the cooling plate temperature below 15°C for effective solidification. Therefore, a cooling plate has been developed using an ice box design with a stainless-steel surface for uniform cooling. Printing trials showed successful solidification for two layers, but the third layer experienced issues like deformation, suggesting that the cooling system needs adjustments for better heat dissipation beyond two layers. To address this, a new cooling plate was designed in SolidWorks (13 × 13 × 2 cm) to enhance heat dissipation and stability. The expected outcomes include improved solidification, better layer adhesion, and uniform cooling, enabling successful multi-layered chocolate printing. Further validation is required before implementation.

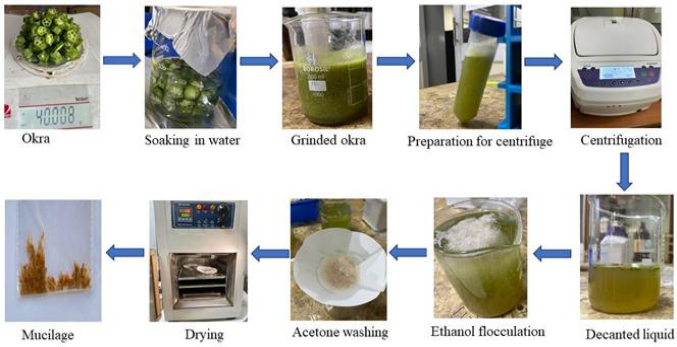
3-D printing of dark chocolate.



Newly designed CAD model of cooling plate

❖ ***Development of rapid method for mucilage production from okra***

A rapid method for production of mucilage from okra has been developed by IIT, Kharagpur. The Okra samples were cut into pieces measuring 1 to 1.5 cm, with 40 g of okra and 22 g of okra peduncle soaked in water at a 1:8 ratio for 6 hours. After soaking, the samples were ground and centrifuged at 4000 rpm for 10 minutes. The supernatant was collected in a beaker and mixed with ethanol in equal proportions. The mixture was left for an hour to allow the mucilage to flocculate. The floccules were washed with acetone and filtered using filter paper to isolate the mucilage, which was then dried at 30°C for 24 hours. The results showed that the mucilage extraction yielded 3.5% (w/w) from okra and 2.0% (w/w) from okra peduncle. The mucilage extraction process using a centrifuge, along with a flowchart of the extraction procedure, is illustrated below.



Centrifuge-assisted mucilage extraction from okra

Centrifuge-assisted mucilage extraction from okra peduncle

- ***Extraction of bioactive compounds from cocoa bean shells contributing to the production of functional ingredients for the food industries***

Process for extraction of bioactive compounds from cocoa bean shells has been developed by KAU, Tavanur. Bioactive extract from cocoa shell powder was spray-dried using chitosan as encapsulating agent at concentration of 5%. Moisture content of the encapsulated cocoa shell powder was determined using an infrared moisture meter. Water activity (a_w) of the powder was determined using water activity meter. The moisture content and water activity were found to be 4% (wet basis) and 0.5 respectively.

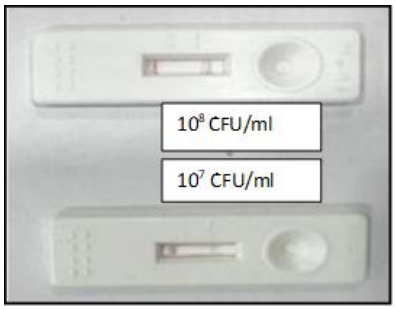
Encapsulated cocoa shell powder

- ***Development and evaluation of osmo-sonicator for production of osmo-dried temperate fruits and vegetables***

Development and evaluation of osmo-sonicator to produce osmo-dried temperate fruits was carried out by YSPUSF, Solan. In the optimization of blanching time, white button mushroom slices were blanched at 95°C for 2, 4, 6, and 8 minutes, with polyphenol oxidase (PPO) and catalase activity measured after each treatment. Mushrooms blanched for 8 minutes exhibited the lowest levels of PPO and catalase activity, making them the preferred choice for further treatment. In the next sub-experiment, blanched mushroom slices were dehydrated using osmosonication in 2%, 5%, and 10% NaCl solutions for 120 minutes. The results showed varying effects on water loss, solid gain, weight reduction, and quality attributes like antioxidant activity, total polyphenol content (TPC), and ascorbic acid. The probe sonication method, particularly at higher salt concentrations, generally yielded better outcomes in terms of antioxidant preservation and minimal weight loss, highlighting the potential of osmosonication as an effective dehydration method for enhancing the quality of mushrooms.

- ***Rapid Detection kit for detection of pathogens in animal-based foods***

Lateral flow- assay-based rapid detection method for pathogens in foods of animal origin was developed by MAFSU, Mumbai.One prototype was developedand trials were carried out. The trial run for the determination of limit of detection of the test sample for 10^8CFU/ml and 10^7CFU/ml and trials for development of test line and standardization is in progress.



Rapid-Detection kit for food-based pathogens

❖ ***Development of hand-operated mushroom bed pressing machine***

Hand operated mushroom bed pressing machine was developed by OUAT, Bhubaneswarfor pressing of soaked crumpled straw in a plastic crate to form the bed. The capacity of the developed machine is 50 beds per h and cost is Rs. 8,000/-.

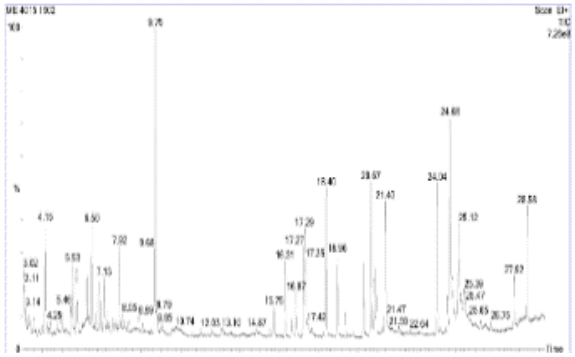
Manual mushroom bed compaction unit

❖ ***Development of machinery and process protocol for value addition of palmyrah***

The Radio Frequency (RF) sterilization was tested on tender palmyrah endosperm treated with 1.5% citric acid at an electrode gap of 185 mm and a conveyor speed of 5 m/h by TNAU, Coimbatore. Stored under ambient and refrigerated conditions, parameters like color, firmness, TSS, and total phenolic content were monitored. Results showed a slight increase in physiological weight loss (0.4% by the 8th day), a decline in firmness from 2.91 N to 2.61 N, and a reduction in total phenolic content from 64.5 to 62.8 µg/100 mg GAE. The findings highlight RF sterilization as a potential method for extending the shelf life of palmyrah.

❖ ***Development of finger millet sprout-based functional fermented beverage using probiotic, prebiotic and synbiotics***

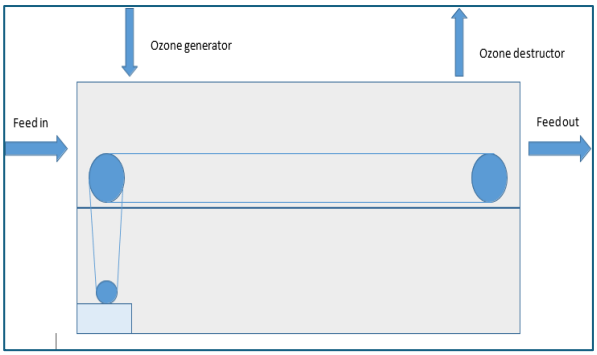
A fermented beverage was developed by TNAU, Coimbatore throughultrasound treatment at 30°C for 20 minutes (US 30-20) and 40°C for 15 minutes (US 40-15) significantly influenced metabolite production in lactic acid bacteria. While the control group maintained essential cellular metabolites, ultrasound-treated bacteria exhibited an increase in bioactive compounds. The US 40-15 treatment yielded the highest levels of phenolic compounds, functional aromatics, and esters, known for their antioxidant, anti-inflammatory, and antimicrobial properties. These findings highlight ultrasound as an effective tool for enhancing metabolite production for health and industrial applications.



GC-MS analysis of LAB metabolites

❖ ***Development of semi-continuous ozone treatment chamber***

A semi-continuous ozone treatment chamber for fresh cut vegetables by KAU, Tavanur. Carrot and green beans were taken as the raw material for this study. Prior to the development of the treatment chamber various physico-chemical properties of carrot and green beans were determined using standard procedure. Based on the preliminary trials, a semi continuous ozone treatment chamber has been designed and its fabrication has been initiated. The schematic diagram of the treatment chamberis depicted below:



Conceptual design of semi-continuous ozone treatment chamber

Table. Specification of semi-continuous ozone treatment chamber

Factors	Values
Chamber material	SS 316
Belt material	SS 304
Length of chamber	206 cm
Widthof chamber	80 cm
Motor power	2 hp
Variable frequency drive	1 No
Pulley (8 inch and 3inch single V pulley)	1 No

AICRP on PEASEM

❖ ***Extraction and Purification of Cellulose from Paddy Straw Powder***

Paddy starw, leaftover stalks and leaves of rice plants, is rich and significant source of cellulose. The process of cellulose extraction from paddy straw was optimized using alkali treatment, followed by filtration and washing to remove hemicellulose. The biomass was then subjected to delignification with peracetic acid, filtered, and dried. Finally, bleaching was done using hydrogen peroxide, resulting in a milky white cellulose. The extracted cellulose can be used for bio-compostable packaging.

Extracted cellulose from paddy straw

❖ ***Raft Aquaponics System***

The floating rafts, measuring 1005 mm × 885 mm with a thickness of 3.76 mm, were designed and fabricated at ICAR-CIFA, Bhubaneshwar. Each raft features 28 planting holes, each with a diameter of 70 mm. Constructed from fiberglass-reinforced plastic (FRP) and supported by a PVC pipe frame, the raft can support a total buoyancy of 11.9 kg, which includes its weight. This ensures stability for the installation of aquatic plants in tanks. These rafts have proven to be a reliable solution for plant cultivation. The pond culture system features rafts constructed from FRP with dimensions of 1830 mm x 1220 mm and a thickness ranging from 3.5 to 4 mm. Each raft is equipped with a 2.13 x 0.91 m airtight PVC pipe frame to ensure buoyancy and contains 40 planting holes, each measuring 70 mm in diameter. Field tests have shown that the raft can support a load of up to 34.125 kg. This system is specifically designed to endure pond con ditions while providing sufficient support for plant growth.

Marigold plant in raft aquaponics

Raft aquaponics in cement cistern

Raft aquaponics in the pond

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ICAR-CIPHET Intellectual Property Rights

Patents

S.No.	Title	Applicationno./Patent no.	Date of filing	Inventors
1.	Microbial method for production of protein isolate/concentrate from oilseed cakes/meals	17/258,088 Allowed on: 22.1.25	Jan 05, 2021	Dr. D.N. Yadav, Dr. Sangita Bnasal, Dr. R.K. Singh, Dr. S.N.Jha

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S.No.	Title	Date of filing	Diary No	Date of registration	Registration No.	Authors
1.	Near infrared spectral dataset for detection and quantification of grass pea/khesari flour adulteration in chickpea flour	06.03.2025	7706/2025-CO/L	Mar 06, 2025	-	Manju Bala, Swati Sethi, Sanjula Sharma, Mridula D., Gurpreet, Kaur, Dhritiman Saha, Nachiket Kotwaliwale
2.	Near infrared spectral dataset for detection	08.03.2025	8037/2025-CO/L	Mar 08, 2025	-	Manju Bala, Swati Sethi, Sanjula Sharma,

	and quantification of metanil yellow adulteration in chickpea flour					Mridula D., Gurpreet Kaur, Dhritiman Saha, Nachiket Kotwaliwale
3.	Near infrared spectral dataset for detection and quantification of pea flour adulteration in chickpea flour	08.03.2025	8024/2025-CO/L	Mar 08, 2025	-	Manju Bala, Swati Sethi, Sanjula Sharma, Mridula D., Gurpreet Kaur, Dhritiman Saha, Nachiket Kotwaliwale

Transfer of Technology

S. No.	Technology	Licensee/ Firm	Licensing fee	Date of license
1.	Liquid Jaggery Production Technology	MauliGulUdyog (Miss. Surekha Sanjay Jagadale), M. No. 65, At. Post. Shiravade (British), Tal: Karad, Dist.: Satara- 415 115	17,700	Dec 27, 2024
2.	Cocoa Fermenter	Chocoa Projects and Ventures, Chennai, Tamil Nadu	25,000	Jan 03, 2025
3.	Rotary dryer for the production of coconut chips	Chocoa Projects and Ventures, Chennai, Tamil Nadu	25,000	Jan 03, 2025
4.	Rotary dryer for the production of coconut chips	G J Enterprises, Palapetty, Malappuram, Kerala	25,000	Jan 03, 2025
5.	Flavored coconut milk	South Canara Coconut Farmers Producers Company, Puttur, Karnataka	25,000	Jan 05, 2025
6.	Kalpa Frozen Delicacy	South Canara Coconut Farmers Producers Company, Puttur, Karnataka	25,000	Jan 05, 2025
7.	Process for preparation of fatfree flavoured makhana	Mr. Anuj Sharma, S/O Mr. Sushil Sharma, #4152, Street No. 1, Gagandeep Colony Kailash Nagar, Ludhiana, Punjab-141001	50,000	Feb 05, 2025
8.	Cereal-gluten free pasta withsemi-popped makhana			
9.	Ready to constitute Makhanakheer mix			
10.	Process for preparation			

	of makhana puffs			
11.	Groundnut based flavoured beverage, curd and paneer	M/s MKD Organic Farm Products, V.P.O. Mathurapur, Distt. Rampur (U.P.)-244922 through its representative Mr. R.R. Mathuria	50,000	Feb 18, 2025
12.	Groundnut based flavoured beverage, curd and paneer	M/s SARSHA IMEX (OPC) PRIVATE LIMITED, Ground Floor, No.1, Kali KadambaNilaya,Near Filter House, KB Extension, Chitradurga, Karnataka, 577501 through its representative Mr. Harshavardhan, R.N.	50,000	Feb 25, 2025
13.	Mechanized System for Primary Roasting of Raw Makhana Seeds and Process Thereof (Patent Application No. -202011037651)	M/s Videhanutra India Private Limited, Ward 06, BarunKashyap s/o Saroj Kumar Jha, Umari Post Office, Balia, Madhubani, Bihar-847403 through its representative Mr. Barun Kashyap	50,000	Feb 25, 2025
14.	Mechanized system for popping and decortications of makhana seeds (Patent No. - 434144)	M/s Videhanutra India Private Limited, Ward 06, BarunKashyap s/o Saroj Kumar Jha, Umari Post Office, Balia, Madhubani, Bihar-847403 through its representative Mr. Barun Kashyap	1,60,000	Feb 25, 2025

Extension Activities

Technology Demonstrations/ FLDs/OFTs

S.No.	Technologies	Demonstrated at	Date	Occasion
1.	Demonstration on Preparation of gluten-free bakery products	ICAR-CIPHET, Ludhiana	Dec 16, 2024	Post-harvest Management of Agricultural Produce" for 25 farmers of ATMA, Gaya (Bihar) during 15-19 Dec. 2024at ICAR-CIPHET, Ludhiana.
2.	Input Distribution	Gov. School, KhuiKhera and Govt. Girls School Abohar	Dec 20, 2024	Under OFT on Anemia
3.	2nd phase of FLD on milk adulteration	ICAR-CIPHET R.S. Abohar	Jan 03, 2025	FLD on milk adulteration
4.	Demonstration on Preparation of gluten-	ICAR-CIPHET, Ludhiana	Jan 30, 2025	Post-harvest Management of Agricultural Produce" for 27

	free bakery products			farmers of ATMA, Dhule (Maharashtra) during 27-31 January 2025at ICAR-CIPHET, Ludhiana.
5.	Dr. Poonam demonstrated the Food Testing Laboratory, CIPHET	ICAR-CIPHET, Ludhiana	Feb 03, 2025	Participants of "Assayer's Training Programme" conducted by IGMRI, PAU campus, Ludhiana
6.	Demonstration on Preparation of gluten-free bakery products	ICAR-CIPHET, Ludhiana	Feb 05, 2025	Post-harvest Management of Agricultural Produce" for 26 farmers of ATMA, Alkola (Maharashtra) during 03-07 February 2025 at ICAR-CIPHET, Ludhiana.
7.	Makhana production technology (demonstrated by Dr. IS Singh and Dr. Manoj Kumar)	Choibari Tea Estate, Assam	Mar 04-07, 2025	A visit under MoU signed between the ICAR-NRCM and the Choibari Tea and Ind. ltd.

Mela/ Exhibitions

S. No.	Programme title	Venue	Duration
1.	Exhibition on women Entrepreneur	ICAR-ATARI, Ludhiana	Jan 11, 2025
2.	KisanMela on crop residue management	KVK FazilkaICAR-CIPHET R.S. Abohar	Feb 15, 2025
3.	Makhana production & Processing Technologies exhibited at "KisanMela 2025"	Dr. RPCAU, Pusa, Samastipur	Feb 15-17, 2025
4.	Makhana production & Processing Technologies exhibited at "KisanMela 2025"	ICAR-RCER, Patna	Feb 20-22, 2025
5.	PusaKrishiVigyan Mela-2025	IARI, Mela ground, New Delhi	Feb 22-24, 2025
6.	Organized stall in KisanMela	Hanumangarh	Mar 08-10, 2025

Awareness programmes

S. No.	Programme title	Venue	Duration	Number of beneficiaries

1.	Two Days Awareness program under SCSP Scheme	ICAR-CIPHET, Ludhiana	23-24 Jan, 2025	210
2.	Awareness program on Impact of foliar spray potassium nitrate on growth and yield of Wheat	Shergarh	Jan 31,2025	32
3.	Awareness program on Efficient and balanced Fertilizer used in horticulture	Ghallu	Feb 04, 2025	26
4.	Awareness program on Management of fruit drop in citrus	Kullar	Feb 05, 2025	28
5.	Awareness program on Fruit drop and disorder management in Kinnow	Tootawala	Feb 20, 2025	25
6.	Exploring Existing supportive schemes of MSME and future possibilities with land holding of banking Sector in the agriculture and Food Processing Machinery Sector	ICAR-CIPHET, Ludhiana	Mar 10, 2025	50
7.	Awareness camp on dirt management for Anaemia control	Govt School, SarvarKhuyian	Mar 12, 2025	10

Stakeholder/ officer/ farmer/ exposure visits

S. No.	**Address of visitors**	**Number of visitors**	**Date**
1.	Farmers from Arniwala Block	25	Dec 19, 2024
2.	Farm women from Ambuja Foundation, Bathinda	31	Dec 24, 2024
3.	Exposure visit on “Integrated Nutrient management under pond and field system of Makhana cultivation”	60	Jan 01, 2025
4.	Exposure visits of KVK Staff to ICAR-CIPHET, Ldh.	05	Jan 06-07, 2025
5.	College of Horticulture and Forestry, Pashighat, Arunachal Pradesh, Central	29 students and 2 faculty	Feb 03, 2025

	Agricultural University, Imphal		
6.	Junagadh Agricultural University, Gunagadh, Gujarat	48 students and 2 faculty	Feb 07, 2025
7.	Sri Karan Narendra Agriculture University	60 students and 2 faculty	Feb 12, 2025
8.	Guru nanak Girls College, Model Town, Ludhiana, Punjab	44 students+6 faculty	Feb 18, 2025
9.	College of Horticultural Engineering & Food Technology (DSLD CHEFT), Devihosur, UHS, Bagalkot	22 students+2 faculty	Feb 25, 2025
10.	College of Agriculture, Peethampuri, Neemka Thana, Sikar, SKNAU, Jobner	30 students +3 faculty	Mar 04, 2025
11.	Sri KondaLaxmanTelangana State Horticultural University (SKLTSHU), Telengana	3 faculty	Mar 05, 2025
12.	Institute of Food Technology, Bundelkhand University, Jhansi, UP	50	Mar 05, 2025
13.	NIFTEM, Thanjavur, Tamil Nadu	63+2 (Faculty)	Mar 12, 2025

Human Resource Development and Capacity Building

Human Resource Development

S. No.	Training title	Venue	Number of participants	Duration
1.	ATMA, Gaya (Bihar) sponsored Farmers training on 'Post-harvest Management of Agricultural Produce"	ICAR-CIPHET, Ludhiana	23	Dec 15-19, 2024 (5 days)
2.	Crop Residue Management	ICAR-CIPHET R.S. Abohar	25	Dec 16-20, 2024 (5 days)
3.	"Scientific methods of roasting and popping of Makhana" (Organized by Er. R. K. Rout, Dr. B. R. Jana; Funded by BAMETI)	ICAR-NRCM, Darbhanga	40	Dec 18, 2024 (1 day)
4.	"Preparation of value-added products from Makhan and Water Chestnut" (Organized by Er. R.K. Rout, Dr. I.S. Singh, and Dr. Manoj Kumar)	ICAR-NRCM, Darbhanga	40	Jan 08, 2025 (1 day)

	Funded by BAMETI, Patna			
5.	Off Campus Training on Value Addition	DabwalaKalan	62	Jan 16, 2025 (1 day)
6.	"Ways of trading of value-added products of makhana, water chestnut and lotus" (Organized by Dr. Manoj Kumar, Co-organized by Dr. I.S. Singh and Er. R.K. Rout; Funded by BAMETI)	ICAR-NRCM, Darbhanga	40	Jan 16, 2025 (1 day)
7.	Scientific Cultivation of Makhana (Funded by Makhana Development Scheme, & Coordinated by ADH, Darbhanga)	ICAR-NRCM, Darbhanga	195	Jan 20-21, 2025 (2 days)
8.	Bee-keeping training	ICAR-CIPHET R.S. Abohar	44	Jan 20-22, 2025 (3 days)
9.	Processing of Horticultural Crops	ICAR-CIPHET, Ludhiana	19	Jan 20-24, 2024 (5 days)
10.	2 days training programme on Storage and Handling and Management Practises for Storage of Durables	Globus Warehouse Pvt. Ltd. Moga, Punjab	20	Jan 27-28, 2025 (2 days)
11.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	27	Jan 27-31, 2025 (5 days)
12.	Training Program on Improved practices to be adopted for improving oil seed production	ICAR-CIPHET, Ludhiana	110	Jan 29-31, 2025 (3 days)
13.	Training on Food Storage and Safety Standard for small scale entrepreneurs and development of entrepreneurship through SHGs	ICAR-CIPHET, Ludhiana	30	Jan 29-31, 2025 (3 days)
14.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	16	Feb 03-07, 2025 (5 days)
15.	21 days ICAR-sponsored Winter School on *"Technological Advances in Packaging and storage of Fresh and Processed Commodities"*	ICAR-CIPHET, Ludhiana	14	Feb 06-26, 2025 (21 days)
16.	Entrepreneurship Development Programme on 'Processing and value addition of green chilli'	ICAR-CIPHET, Ludhiana	2	Feb 10-12, 2025 (3 days)
17.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	27	Feb 10-14, 2025 (5 days)

18.	Makhana processing and value addition	NRCM, Darbhanga	20	Feb 13, 2025 (1 day)
19.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	25	Feb 17-21, 2025 (5 days)
20.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	29	Feb 24-28, 2025 (5 days)
21.	Entrepreneurship development through processing & value addition of Kinnow, Aonla, Guava	ICAR-CIPHET R.S. Abohar	25	Feb 24 – Mar 5, 2025 (10 days)
22.	Processing and value addition of Agricultural Produce	ICAR-CIPHET, Ludhiana	26 (SCSP)	Mar 03-05, 2025 (3 days)
23.	Post-harvest Technologies of Agricultural Produce	ICAR-CIPHET, Ludhiana	25	Mar 03-07, 2025 (5 days)

Skill Development

S. No.	Staff name	Title of the programme	Venue	Duration
1.	Dr. Shrikrishna Nishani	Three-days training on Post-Harvest Management and Storage Techniques	NIPHM, Hyderabad	Dec 16-18, 2024 (3 Days)
2.	Vinod K. Padala	Post-Harvest Management and Storage Techniques		
3.	Dr. Prakash Chand Gurjar Dr. Kishan Kumar Patel Dr. Ramesh Chand Kantwa Harender Singh Dahiya	To Participant the Orientation course on "Frontline Extension System for Young KVK Professionals"	ATARI Ludhiana	Dec 20-24, 2025 (5 days)
4.	Dr. Amit Nath & Dr. Ramesh Kumar	AICTE-ATAL Academy Sponsored Faculty Development Program on Emerging Technologies in Postharvest Management & Value Addition in Horticultural Commodities (3rd – 8th February 2025)	Virtual mode	Feb 03-08, 2025 (6 days)
5.	Dr. Vikas Kumar	Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025:2017	NITS, Noida	Feb 17-20, 2025 (4 Days)
6.	Sh. Anuj Sh. Lakshay,	Orientation Training of Module-II Training Programme for newly	ICAR-NDRI, Karnal	Feb 17-21, 2025 (5-days)

	Sh. Rahul Kumar, Assistants, ICAR-CIPHET, Ludhiana & Abohar	recruited Assistants		
7.	Ms. Soumya Mohapatra	Orientation workshop on 'Mission Karmayogi' organized by the Capacity Building Commission, GoI and ICAR-NAARM	Virtual mode	Feb 27, 2025 (1 day)

Awards/Recognition

Name of the awardee	Name of award	Awarded from
Dr. Ramesh Chand Kasana	Editorial Board of Frontiers in Nutrition as Review Editor for the section on Nutrition and Microbes	Frontiers in Nutrition Journal
	Life member	
Ranjeet Singh, Sandeep P Dawange and Soumya Mohapatra	Best Poster Presentation	Department of Food and Nutrition, Punjab Agricultural University (PAU), Ludhiana
Dr. Surya Tushir	Best oral presentation award	PAU, Ludhiana
Dr. Shrikrishna Nishani	Best Oral presentation award	International Conference Organized by UHS Bagalkot, Karnataka
Dr. Surya Tushir	First in oral presentation	Global Conference on "Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food System" held at ICAR-CIWA, Bhubaneswar during 8th-10th March, 2025
Dr. Swati Sethi	Second in oral presentation	
Dr.Shaghaf Kaukab	Best/First Oral presentation award	
Dr. Leena Kumari	Best/First Oral presentation award	
Ms. Soumya Mohapatra	Best Oral Presentation	
Dr.Shaghaf Kaukab	Best Paper presentation award (oral)	National seminar on "Progresive Agriculture-Viksit Bharat: Preparedness for Eastern Region (PAVER-2025)
Soumya Mohapatra	Best Oral Presentation	National Seminar on "Agri-Diversification and Eco-Regional Farming" held at ICAR-MGIFRI, Bihar during 4th-5th March, 2025
Karnail Singh	Fellow Farmer	IARI PUSA

Lecture delivered

Name of the official	Title of the lecture	Programme	Venue	Date
Dr. Manju Bala	Participated and attended Meeting to discuss the STDF PPG on the proposal "Mitigating Aflatoxin contamination in Peanuts in India	Mitigating Aflatoxin contamination in Peanuts in India	ICAR-CIPHET, Ludhiana (Online mode)	Jan 07, 2025
Dr. Manju Bala	Oilseeds Processing through SCFE	ICAR sponsored Winter School on 'Recent technological advancements in processing, packaging and quality assessment of health foods for fostering safe, improved and sustainable human living'	PAU, Ludhiana	Jan 29, 2025
Dr. Sandeep Mann	"Storage of pulses"	05 Days Training at ICAR-CIPHET	ICAR-CIPHET, Ludhiana	Feb 07, 2025
Dr. Ravi Prakash	Phase Change Materials in Food Packaging and Storage	ICAR Sponsored 21 days Winter School on *Technological Advances in Packaging and Storage of Fresh and Processed Agricultural Commodities"* February 06-26, 2025	ICAR-CIPHET, Ludhiana	Feb 11, 2025
Thingujam Bidyalakshmi	X-ray in quality assessment of stored commodities		Conference Hall-1, ICAR-CIPHET, Ludhiana	Feb 12, 2025
Dr. Ravi Prakash	Work-Life Balance	ICAR Sponsored 21 days Winter School on "*Technological*	ICAR-CIPHET, Ludhiana	Feb 17, 2025
Dr. Shrikrishna Nishani	Demonstration of WVTR and GTR			

	of packaging materials	*Advances in Packaging and Storage of Fresh and Processed Agricultural Commodities"*		
Dr. Shrikrishna Nishani	Ethylene management during storage of fruits and Vegetables			
Ms. Soumya Mohapatra	Storage Economics and Inventory Management			Feb 18, 2025
Dr. ManjuBala	Sustainable and Effective Packaging for Edible Oils and Fats			Feb 19, 2025
Dr. Sandeep Mann	"Quality monitoring during storage of grains"			Feb 20, 2025
Dr. Rupendra Kaur	Lecture delivered on health care and nutrition management through kitchen gardening.	SCSP program conducted by Farm SalahakarCenter, PAU, RS,	BekanWala (SarwarKhuiya)	Feb 22, 2025
Dr. Poonam	Biochemical strategies for extension of shelf-life	ICAR sponsored winter school on "Technological Advances in Packaging and Storage of Fresh and Processed Agricultural Commodities"	ICAR-CIPHET, Ludhiana	Feb 24, 2025
Dr. ManjuBala	Quality, biochemical aspects & waste utilization of kinnow, guava &Aonla into value added products	ICAR sponsored Short Course on '"Entrepreneurship Development through Processing & Value Addition of Kinnow, Aonla and Guava"	Through virtual mode at ICAR-CIPHET, Ludhiana	Feb 27, 2025
Dr. Sandeep Mann	on farm Processing technologies suitable for small scale entrepreneurship"	Training program organizedby ICAR ATARI, Ludhiana in collaboration with KVK Samba	SKUAST, Jammu	03-04 Mar, 2025

		and KVK RS Pura and Farmers First Team of SKUAST- Jammu		
Dr. Rupenderkaur	Lecture delivered on Post Harvest management in Centre warehouse Training Program	Centre warehouse Training Program	Fazilka	Mar 05, 2025
Dr. Arvind Kumar Ahlawat	Entrepreneurship development and Value Addition of Honey	Save Bee and Bee Farmer	Roherianwali, Abohar	Mar 08, 2025
	Entrepreneurship in Agriculture: Opportunities for Farmers	KisanMela	Hanumangarh	Mar 09, 2025
Dr Pankaj Kumar	Drying of maize: available technologies and industry situation in India	Winter School on *"Climate Smart Maize Agriculture for Food and Energy Security in India."*	ICAR-CIPHET, Ludhiana	Mar 17, 2025
Dr. Sandeep Mann	On Farm Fruit & Vegetable Processing & PHM	Lecture series under the scheme " Strengthening & Development of Higher Agricultural Education in India	PAU, Ludhiana	Mar 18, 2025
	Processing and value addition : An Entrepreneurship Opportunity			
Dr. Sandeep Mann	"Secondary agriculture enterprises for doubling farmers' income"	Winter School on "Climate Smart Maize Agriculture for Food and Energy Security in India."	ICAR-CIPHET, Ludhiana	Mar 20, 2025

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

S. No.	Name of the official	Conference/ symposia/ workshop/ meetings, etc	Venue	Date
1.	Dr. Amit Nath & Dr. Ramesh Kumar	National Seminar on Agriculture Food Processing Machinery	BIS, New Delhi	Dec 18, 2024

2.	Dr. Manju Bala	Meeting on Automatic moisture meters demonstration and interaction with FCI	ICAR-CIPHET, Ludhiana	Jan 01, 2025
3.	Dr. Arvind Kumar Ahlawat	Meeting on Use of fermented organic manures	DC Fazilka	Jan 22, 2025
4.	Dr Navnath Indore and Dr. Shaghaf Kaukab	NSC Meeting DoCA	ICAR CIPHET, Ludhiana	Jan 22, 2025
5.	Dr. Manju Bala	Acted as a Chairperson in a Session for the National Seminar "Viksit Bharat 2047: Nutrition, Psychology and Screen Time: Status, Interplay, Challenges, and Way Forward.	PAU, Ludhiana	Jan 29, 2025
6.	Dr. Surya Tushir	National Seminar on "Viksit Bharat 2047: Nutrition, Psychology, and Screen Time: Status, Interplay, Challenges, and Way Forward	Department of Food and Nutrition, Punjab Agricultural University, Ludhiana.	Jan 29, 2025
7.	Ranjeet Singh			
8.	Sameer Sharma			
9.	Dr. Kishan Kumar patel	Technological advances in Packaging and Storage of fresh and processed agriculture commodities	ICAR-CIPHET, Ludhiana	Feb 06-26, 2025
10.	Dr. Arvind Kumar Ahlawat, Dr. Prakash Chand Gurjar	Meeting on fermented liquid organic manures	ICAR-ATARI Ludhiana	Feb 10, 2025
11.	Dr. Shaghaf Kaukab	National seminar on "Progressive Agriculture – Viksit Bharat: Preparedness for Eastern India (PAVER 2025)" oraganized by ICAR-RCER, Patna in collaboration with Indian Society of Agronomy	BAU Chapter, Sabour	Feb 21-23, 2025
12.	Dr. Ramesh Chand Kantwa	Short Course Training on Entrepreneurship Development through Processing and Value addition of Kinnow, Amla& Guava	ICAR-CIPHET R.S. Abohar	Feb 24-05 Mar, 2025
13.	Dr. Ramesh Chand Kantwa			
14.	Mr. harender Singh Dahiya			
15.	Dr. Rupender Kaur			
16.	Vinod K. Padala	Second International Conference on Biological Control: Biocontrol Contributions to One Health	Bengaluru, India	Feb 25–28, 2025
17.	Dr. Guru P. N.	Mission Karma Yogi	ICAR-	Feb 27, 2025

			NAARM and ICAR Headquaters	
18.	Dr. Guru P. N.	Second progress review meeting of National steering committee (NSC)	NASC, New Delhi	Feb 27, 2025.
19.	Er. Sunita Thongam and Dr.Shaghaf Kaukab	National Seminar	Department of Food and Nutrition, College of Community Science PAU, Ludhiana	Feb 28, 2025
20.	Dr. ManjuBala	International Wheat Milling Conclave, "The Future of Milling: Vision 2030 & Beyond	JW Marriot, Goa	Mar 03-04, 2025
21.	Dr. Arvind Kumar Ahlawat	The Future of Milling Vision 2030 & beyond	National Platform of Indian Wheat Flour Millers	Mar 03-04, 2025
22.	Soumya Mohapatra	National Seminar on "Agri-Diversification and Eco-Regional Farming"	ICAR-MGIFRI, Bihar	Mar 04-05, 2025
23.	Mr. Rajesh Kumar	Use of Drones in Agriculture	Junagadh Agriculture University and M/s OptimusInfracom Ltd. New Delhi	05 Mar, 2025
24.	Dr. Amit Nath	Global Conference on "Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food System"	ICAR - Central Institute for Women in Agriculture, Bhubaneswar, India.	Mar 08-10, 2025
25.	Dr. Leena Kumari and Dr. Shaghaf Kaukab			
26.	Shailendra Mohan Raut			
27.	Ms. Soumya Mohapatra			
28.	Dr. Manju Bala	Delivered keynote lecture on 'Waste valorisation of immature kinnow droppings for sustainable women-led agribusiness'		
29.	Dr. Surya Tushir	Global Conference on "Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food System"		
30.	Dr. Shivani			
31.	Dr. ManjuBala	14th Meeting of FAD 28 (Test	Through virtual mode	Mar 11, 2025

		Methods for Food Products Sectional Committee).	at ICAR-CIPHET, Ludhiana	
32.	Dr Pankaj Kumar	BIS meeting	BIS, New Delhi	Mar 12, 2025

Personalia

❖ **Promotion and new joining:**

- Sh. Gurdeep Singh, Ex-Technical Officer, ICAR-CIPHET, Ludhiana has been promoted as Senior Technical Officer w.e.f. Jan 01, 2023.
- Dr. PrernaNath, Scientist promoted to the post of Sr. Scientist.
- Dr. LeenaKumari, Scientist promoted to the post of Sr. Scientist.
- Dr. Surya, Scientist promoted to the post of Sr. Scientist.
- Dr. DhritimanSaha, Scientist promoted to the post of Sr. Scientist.
- Dr. ChandanSolanki, Scientist promoted to the post of Sr. Scientist.
- Dr. DeepikaGoswami, Scientist promoted to the post of Sr. Scientist**.**

❖ **Training**:

- **Orientation Training organised:** Orientation training has been given to Miss. Komal, newly Assistant, ICAR-CITH, Srinagar w.e.f. Dec 30, 2024 to Jan 03, 2025 at ICAR-CIPHET, Ludhiana

Important Events

❖ 5-day ATMA, Gaya (Bihar) sponsored farmers training on "Post-harvest Management of Agricultural Produce" during Dec 15-19, 2024

❖ Distribution of beneficiary items to the Scheduled caste community of KokriKalan, Moga (Punjab) on Dec 12, 2024.

❖ **Celebration of Farmers Day: Dec 23, 2024**

The celebration of Farmers' Day at ICAR-CIPHET, R.S. Abohar, witnessed the active participation of 85 farmers, who gathered to gain insights and knowledge from a series of informative lectures. Various experts and researchers delivered talks on modern agricultural practices, technological advancements, and sustainable farming techniques aimed at improving productivity and addressing challenges faced by the farmers. The event fostered the interaction between scientists and farmers, promoting the exchange of valuable information to enhance agricultural practices and ensure the well-being of the farming community.

❖ 38th Institute Management Committee (IMC) meeting was organized at ICAR-CIPHET, Ludhiana on Feb 12, 2025.

❖ 27th Meting Research Advisory Committee (RAC) Meeting was organised at ICAR-CIPHET, Ludhiana and Regional; Station, ICAR-CIPHET, Abohar during Feb 13-15, 2025.

❖ **Celebrated of International Women's Day**

On the occasion of International Women's Day, a special celebration was held at KVK, RS-CIPHET AboharIn Collaboration with RGR Cell Fazilka, with the participation of 100 women who gathered to focus on women's empowerment and the development of entrepreneurship through various agriculture allied activities. The event provided a platform to highlight the critical role lead by women in the agricultural and allied sector, encouraging them to explore tremendous opportunities in areas like dairy farming, poultry, horticulture etc. Through interactive sessions and skill-building workshops, the program aimed to equip women with the knowledge and skills needed to start and grow their own agricultural enterprises or startups. The event was an inspiring step towards fostering financial independence and creating sustainable livelihoods for women in rural communities.

- **Visit of the Honourable Minister of Agriculture and Farmers Welfare, Government of India, and the Deputy Chief Minister of Bihar to ICAR-NRC, Makhana, Darbhanga**

The Honourable Minister of Agriculture and Farmers Welfare, Government of India, Sh. Shivraj Singh Chauhan and the Deputy Chief Minister of Bihar Sh. SamratChaudhry Visited ICAR-NRC For Makhana, Darbhanga on Feb 23, 2025. The Honourable Agriculture Minister transplanted some makhana seedlings in the experimental plots, planted some fruit trees and had a detailed interaction with the makhana farmers in "KISAN SAMWAD" programme. The Hon'ble minister along with the Deputy CM, Darbhanga MP, other state ministers and MLAs also visited the exhibition stalls and the processing units of Makhana. He had a press conference in the conference hall of the institute. The Honourable Agriculture Minister said that the Makhana Board will be constituted only after taking inputs from makhana farmers. He instructed the Scientists to develop a thornless variety of makhana to make its cultivation easier for the farmers. Honourable ADG, Process Engineering, ICAR, New Delhi Dr. K Narsaiah received the Hon'ble Minister at Darbhanga Airport. Over 1200 farmers from across the districts of North Bihar participated in the event.

- **The visit of Telangana state officials to ICAR-NRCM, Darbhanga:**

The visit of Telangana state officials to ICAR-NRCM, Darbhanga, from 3rd March to 6th March 2025, aimed to understand the cultivation and processing of Makhana for potential implementation in Telangana. The delegation included Sh. Ananta Reddy, District Horticulture Officer, Nalgonda; Dr. Lingaiah, Senior Scientist, PJTSAU, Hyderabad; Dr. Raja Goud, Senior Scientist, SKLTSHU, Hyderabad; and Sh. Srinivas, Agricultural Officer, Nalgonda. During their visit, they explored Makhana cultivation techniques through a field visit to Sunki, Darbhanga, and Madhubani where they interacted

with local farmers regarding the opportunities and challenges in makhana cultivation and they observed traditional processing methods. They also toured the ICAR-NRCM fields, witnessing a live demonstration of transplanting techniques, and visited the Makhana processing unit to understand post-harvest handling. Additionally, the officials expressed interest in obtaining Makhana seeds for demonstration in Telangana. The visit was highly informative, with valuable insights gained from ICAR-NRCM, Darbhanga, and all scientists of NRCM, Darbhanga actively participated in the discussions and demonstrations.

Visit to Experimental plots of Makhana at NRCM, Darbhanga

Media Coverage

दरभंगा में रविवार को तालाब में मखाने के पौधे के साथ केंद्रीय कृषि मंत्री शिवराज सिंह चौहान व उपमुख्यमंत्री सम्राट चौधरी।

सुपर फूड के रूप में दुनिया में छाएगा मखाना

बोले शिवराज

- केंद्रीय कृषि मंत्री ने राष्ट्रीय मखाना अनुसंधान केन्द्र, दरभंगा में किसानों से किया संवाद

दरभंगा, प्रसं। केंद्रीय कृषि मंत्री शिवराज सिंह चौहान ने रविवार को दरभंगा में आयोजित कार्यक्रम में कहा कि मखाना जल्द सुपर फूड के रूप में पूरी दुनिया में छा जाएगा। इसके लिए मखाना की बेहतर मार्केटिंग, ब्रांडिंग और पैकेजिंग की व्यवस्था की जाएगी। मखाना उत्पादकों को उचित मूल्य मिले, इसके लिए घरेलू व अंतरराष्ट्रीय बाजार को भी विकसित किया जाएगा।

दरभंगा के दिल्ली मोड़ स्थित राष्ट्रीय मखाना अनुसंधान केंद्र परिसर में मखाना कृषकों के साथ संवाद के दौरान उन्होंने कहा कि जानकारी मिली है कि लीज पर जमीन लेकर मखाना की खेती करने वाले किसानों को सरकारी अनुदान सहित अन्य लाभ नहीं मिलते हैं। अब ऐसी व्यवस्था की जाएगी कि लीज पर खेत लेकर मखाना की खेती करने वाले किसानों को भी सरकारी अनुदान व अन्य योजनाओं का लाभ मिले। कृषि मंत्री ने कहा कि मखाना उत्पादक किसानों से बात किये बिना मखाना बोर्ड का गठन करना मुझे सही नहीं लगा, इसलिए यहां हम मखाना किसानों से बात करने आये हैं।

कृषि मंत्री ने कहा कि बटाई पर खेत लेकर मखाना की खेती करने वाले किसानों को भी फायदा हो, इसके लिए काम किया जाएगा। इसके अलावा मखाना उत्पादकों के लिए प्रशिक्षण शिविर, कार्यशाला, कौशल विकास आदि की दिशा में भी गंभीरता से काम होगा। उन्होंने सोमवार को भागलपुर में होनेवाले पीएम मोदी के कार्यक्रम में आने की लोगों से अपील की। इससे पहले केंद्रीय कृषि मंत्री ने परिसर में स्थित तालाब में अपने हाथों से मखाना का पौधा लगाया और इसकी खेती के बारे में जानकारी ली। उन्होंने परिसर में पौधरोपण भी किया। इसके बाद उन्होंने मखाना बोर्ड के गठन के लिए किसानों से सुझाव लिए।

उप मुख्यमंत्री सम्राट चौधरी ने कहा कि मखाना किसानों के लिए जमीन का पट्टा तथा उन्हें कानूनी अधिकार दिलाने के लिए वे मुख्यमंत्री नीतीश कुमार से बात करेंगे। इसके अलावा मखाना किसानों को आयुष्मान योजना से भी जोड़ा जाएगा।

दरभंगा- बेनीपुर-बिरौल प्रभात

मुजफ्फरपुर, सोमवार 24.02.2025 06

दिलाया भरोसा. केन्द्र व राज्य सरकार मखाना व मखली पालन क्षेत्र के विस्तार पर कर रही काम

देश के अलावा विदेशों तक अपनी पहचान बना चुका है मिथिला का मखाना : डिप्टी सीएम

कपास को मुख्य फसल के तौर पर अपनाने पर दिया जोर

सवेरा न्यूज/कबूरिया

अबोहर, 24 दिसंबर : कृषि विज्ञान केंद्र द्वारा सोमवार को किसान दिवस के अवसर पर एक विशेष कार्यक्रम का आयोजन किया गया। कार्यक्रम में कृषि विज्ञान केंद्र के प्रमुख डॉ. अरविंद कुमार अहलावत ने उपस्थित सभी किसानों को किसान दिवस की बधाई दी तथा कृषि विज्ञान केंद्र द्वारा किसानों के लिए चलाये जा रहे विभिन्न कार्यक्रमों से अवगत कराया तथा उन्नत कृषि तकनीक से प्रेरित होकर किसानों को खुशहाली प्रदान की। डॉ. मनप्रीत सिंह वैज्ञानिक क्षेत्रीय केंद्र, पंजाब कृषि विश्वविद्यालय, अबोहर ने रबी फसलों की उन्नत तकनीक के बारे में विस्तृत जानकारी देते हुए कपास को क्षेत्र की मुख्य फसल के रूप में अपनाकर फाजिल्का जिले की पारंपरिक खेती के माध्यम से मिट्टी और पर्यावरण संरक्षण के महत्व पर जोर दिया। डॉ. जगदीश अरोड़ा वैज्ञानिक फार्म सलाहकार केंद्र अबोहर ने जलवायु परिवर्तन को नियंत्रित करने के लिए उचित फसल चक्र अपनाकर और वाणिज्यिक फसलों में विभिन्न चरणों में पोषक तत्वों का प्रबंधन करके बागवानी को बढ़ावा देने पर जोर दिया। पृथ्वीराज ने किसानों को उपलब्ध विभिन्न सरकारी योजनाओं की जानकारी दी। प्रगतिशील किसान सरवन सिंह सिहाग ने किसानों से प्राकृतिक खेती अपनाने और वैज्ञानिकों से कपास की उन्नत किस्मों के बीज उपलब्ध कराने का आग्रह किया। इस अवसर पर विशेषज्ञ डॉ. रूपेंद्र कौर, डॉ. किशन कुमार पटेल, डॉ. रमेश चंद कांटिया, हरेंद्र सिंह ढहिया, विमल मोहरिया उपस्थित रहे तथा कुल 90 किसानों ने भाग लेकर कार्यक्रम को सफल बनाया।

किसानों को सम्मानित करते हुए केवीके के प्रभारी डा. अरविंद कुमार अहलावत व अन्य।

विकसित होगा कांटा रहित मखाना का पौधा : शिवराज

मखाना के बारे में जानकारी लेते केंद्रीय कृषि मंत्री शिवराज सिंह चौहान।

- मखाना की रोपनी व तालाब से गुड़ी निकालने के लिए बनेंगे यंत्र
- राष्ट्रीय मखाना अनुसंधान केन्द्र के वैज्ञानिकों को दिया गया निर्देश

संवाददाता, दरभंगा

केंद्रीय कृषि मंत्री शिवराज सिंह चौहान ने कहा कि राष्ट्रीय मखाना अनुसंधान केन्द्र के वैज्ञानिकों को कांटा रहित मखाना का पौधा विकसित करने का निर्देश दिया गया है. साथ ही मखाना की रोपनी व तालाब से गुड़ी बाहर निकालने वाले यंत्र बनाने को कहा गया है. इससे किसानों को मखाना की खेती में काफी सहूलियत होगी. केंद्रीय मंत्री ने रविवार को राष्ट्रीय मखाना अनुसंधान केन्द्र में किसान संवाद कार्यक्रम में यह जानकारी दी. मंत्री ने कहा कि मखाना पौष्टिकता का भंडार है. मिथिला में व्यापक रूप से इसकी खेती की जाती है. मखाना के क्षेत्र विस्तार के लिए केंद्र सरकार कई योजना संचालित कर रही है. उन्होंने कहा कि हम दिल्ली में बैठकर मखाना बोर्ड का गठन कर सकते थे, लेकिन फैसला लिया कि किसानों के बीच पहुंचकर उनकी समस्याओं को पहले जान लें.

आधारभूत संरचना पर हो रहा काम

केंद्रीय मंत्री ने कहा कि मखाना उत्पादन को बढ़ावा देने के लिये तमाम आधारभूत संरचना पर काम हो रहा है. उत्पादन लागत कम करने, उत्पादन में आ रही कठिनाइयों को दूर करने, मनरेगा से तालाबों का निर्माण कराने, मंडी की व्यवस्था करने, किसानों को प्रशिक्षण देने, छोटे किसानों को आसानी से लीज पर भूमि उपलब्ध कराने आदि की व्यवस्था की जा रही है.

किसानों ने रखी समस्या, दिये सुझाव

मंत्री ने कहा कि किसानों की कई समस्याएं समेत कई अहम सुझाव सामने आये हैं. इसे देखते हुए मखाना विकास बोर्ड का गठन किया जायेगा. किसानों ने मंत्री को बताया कि मखाना की खेती बहुत कठिन होती है. रोपनी से लेकर लावा निकालने तक में काफी परिश्रम करना पड़ता है.

अंतर्राष्ट्रीय महिला दिवस पर नारी शक्ति सम्मान समारोह

सवेरा न्यूज/कबूरिया

अबोहर, 8 मार्च : कृषि विज्ञान केंद्र, भारतीय कृषि अनुसंधान परिषद क्षेत्रीय केंद्र सीफेट, अबोहर में आरजीआर सेल के सहयोग से अंतर्राष्ट्रीय महिला दिवस का भव्य आयोजन किया गया। सप्ताह में महिला सशक्तिकरण को बढ़ावा देने के लिए विशेष कार्यक्रम आयोजित किए गए। कार्यक्रम के दौरान महिला किसानों, कृषि वैज्ञानिकों और उद्यमियों को सम्मान पत्र, पुरस्कार और विशेष उपहार देकर उनकी उपलब्धियों की सराहना की गई। इस अवसर पर महिला प्रतिभागियों ने अपने अनुभव साझा किए और सशक्तिकरण के नए आयामों पर चर्चा की। इस अवसर पर कई प्रतिष्ठित वक्ताओं ने अपने विचार प्रस्तुत किए। डॉ. अरविंद कुमार अहलावत (प्रधान, कृषि विज्ञान केंद्र, फाजिल्का) ने महिला किसानों की भूमिका और कृषि क्षेत्र में उनके योगदान पर प्रकाश डाला। डॉ. रूपेंद्र कौर ने महिला उद्यमिता और आत्मनिर्भरता पर विशेष व्याख्यान दिया। मैडम अनू गोयल और मैडम ममता जसूजा ने महिला शिक्षा, नेतृत्व और सशक्तिकरण के विभिन्न पहलुओं पर चर्चा की। मैडम सुनिधि ने अनुसंधान और नवाचार की भूमिका को उजागर करते हुए महिलाओं को प्रोत्साहित किया। सभी वक्ताओं ने महिलाओं को आत्मनिर्भर बनने और कृषि एवं उद्यमिता के क्षेत्र में नवाचार अपनाने की प्रेरणा दी। इस अवसर पर नीरू प्रणामी (बीजेपी जिला प्रधान, फाजिल्का), वंदना सांगवान और रेनू शर्मा ने अपनी गरिमामयी उपस्थिति से कार्यक्रम की शोभा बढ़ाई। कार्यक्रम को ओर आकर्षक बनाने के लिए बच्चों ने शानदार नृत्य और कविता पाठ की प्रस्तुतियां दी जिससे दर्शक मंत्रमुग्ध हो गए। इस सफल आयोजन ने नारी शक्ति को सशक्त करने की दिशा में एक महत्वपूर्ण कदम बढ़ाया और महिलाओं को नई ऊंचाइयों तक पहुंचने के लिए प्रेरित किया।

महिलाओं को सम्मानित करते सीफेट कर्मचारी व अतिथि।

A farmer's success story

Sh. Karnail Singh is a progressive and innovative farmer from the village GhatianWaliBodla, Tehsil, District Fazilka, Punjab. He is actively involved in diversified farming practices. Sh. Karnail Singh owns 22 acres of fully irrigated agricultural land, where he practices integrated farming. His ventures include vegetable cultivation, dairy farming, fish farming, and mushroom cultivation. Despite having no natural water bodies on his land, he effectively manages irrigation through four electric motors (5 HP each) and two solar-powered water pumps (5 HP each). Equipped with a robust set of farm machinery—including two tractors, a zero till drill, disc harrow, cultivators, reaper, rota-vator etc. ensuring efficient and sustainable farming operations. His resourceful use of modern equipment and techniques exemplifies his commitment to productivity and environmental stewardship.Over the years, Karnail Singh has been honored 54 times in various competitions and categories at different Kisan Melas.

Major Highlights of Recognitions:

- **Nahar Award (18th March 2003):** Conferred by the Punjab Government for outstanding

achievements in cotton farming, presented by Captain Amarinder Singh, then Chief Minister of Punjab.

- **First Prize in Cotton Category – Punjab Agricultural University (PAU):** Recognized for excellence in cotton cultivation, this award was presented by Dr. Aulakh, the Vice-Chancellor of PAU.
- **Cotton State Award (5th March 2003):** Presented at the KisanMela in Bathinda by then Chief Minister Captain Amarinder Singh Ji for remarkable contributions to cotton farming.
- **Cotton State Award (14th April 2007):** Received again at the Bathinda KisanMela, this time presented by SardarPrakash Singh BadalJi, then Chief Minister of Punjab, for continued excellence in cotton farming.
- **National Award for Technology and Management in Agriculture (2013-14):** Honored with the prestigious ATMA Award for achievements in vegetable production and mushroom cultivation. The award was presented by NarendraModi, then Chief Minister of Gujarat, during a ceremony recognizing outstanding farmers.
- **"SafalKissan, Bharat KeShaan" Award:** Presented by Monsanto, a U.S.-based agricultural biotechnology corporation, in Chandigarh. This award recognized his innovative farming practices and significant contributions to Indian agriculture.
- **IIFA 2024 Award for Outstanding Farmer:** Awarded by **ICAR-CIPHET, Ludhiana**, acknowledging his dedication to the latest crop and vegetable production techniques. The award also honors his leadership in encouraging fellow farmers to adopt advanced technologies, thereby promoting sustainable and innovative agricultural practices.
- **IARI-Fellow Farmer Award (2025)**: Only farmer from the Punjab to be Awarded with Fellow Farmer Award by ICAR DG, Dr. HimashuPathak during PusaKisan-Mela for his outstanding contribution toward farming community and his dedication to latest crop and vegetable production techniques encouraging fellow farmers to adopt advanced technologies.