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वार्षिक प्रतिवेदन
ANNUAL REPORT
2025

भा.कृ.अनु.प.–केन्द्रीय कटाई–उपरान्त अभियांत्रिकी एवं प्रौद्योगिकी संस्थान
लुधियाना–141004, पंजाब, भारत
ICAR-Central Institute of Post-Harvest Engineering and Technology
Ludhiana-141004, Punjab, India
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प्रस्तावना

मुझे भा.कृ.अनु.प.–केन्द्रीय कटाई उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान, लुधियाना की वार्षिक प्रतिवेदन–2025 प्रस्तुत करते हुए अत्यंत प्रसन्नता हो रही है। यह प्रतिवेदन वर्ष के दौरान संस्थान की प्रमुख गतिविधियों, विस्तार पहलों तथा महत्वपूर्ण उपलब्धियों का समग्र विवरण प्रस्तुत करती है। संस्थान किसानों एवं उद्यमियों की दक्षता बढ़ाने, कटाई उपरांत होने वाली हानि को कम करने, मूल्य संवर्धन को प्रोत्साहित करने, किसानों की आय वृद्धि हेतु उद्यमिता को बढ़ावा देने तथा कृषि उप–उत्पादों के प्रभावी उपयोग के लिए नवीन कटाई उपरांत प्रौद्योगिकियों के विकास के माध्यम से समाज की सेवा के प्रति निरंतर प्रतिबद्ध है। इसमें दो अखिल भारतीय समन्वित अनुसंधान परियोजनाओं (एआईसीआरपी) तथा एक संयुक्त अनुसंधान परियोजना (सीआरपी) के अंतर्गत किए गए योगदानों का भी विस्तृत विवरण शामिल है।

वर्ष के दौरान संस्थान द्वारा विकसित उन्नत प्रौद्योगिकियों, अभियांत्रिकीय समाधानों तथा नवाचारी खाद्य उत्पादों सहित विविध परिणाम प्रस्तुत किए गए हैं। खाद्य सुरक्षा के क्षेत्र में शीघ्र निदान हेतु मक्का में अत्यंत कम स्तर (0.624 µg/kg) पर अफ्लाटॉक्सिन B1 की पहचान के लिए बायोसेंसर आधारित ELISA प्रक्रिया विकसित की गई, जो पारंपरिक विधियों का एक शीघ्र विकल्प प्रदान करती है। लघु स्तर के उपयोग के लिए मिनी मिलेट मिल तथा ग्रिट निर्माण मशीन जैसी नवीन प्रसंस्करण तकनीकों का विकास किया गया। मूल्य संवर्धित खाद्य उत्पादों में कम वसा युक्त बिस्कुट, भुने हुए ब्राउन राइस युक्त ग्रीन टी, वैक्यूम–फ्राइड चुकंदर चिप्स, फाइबर–समृद्ध पास्ता तथा भैंस मांस आधारित पालतू स्नैक्स का मानकीकरण किया गया। इसके अतिरिक्त, मखाना आधारित इंस्टेंट पास्ता, सिरिधान्य आधारित तुरंत तैयार मिश्रण तथा तिखुर पेय जैसे पोषण समृद्ध उत्पाद विकसित किए गए, जो आहार विविधीकरण को बढ़ावा देते हैं। अभियांत्रिकी नवाचारों में मक्का के भुट्टे सुखाने की मशीन तथा भुने हुए मखाने के बीज छांटने की मशीन और मखाने के बीज संग्रहण प्रणाली का विकास किया गया। स्वचालित प्रणालियों में भुने हुए मखाना बीज सॉर्टर तथा नारियल चिप्स के लिए रोटरी ड्रायर–सह–फ्लेवर कोटिंग मशीन विकसित की गई। निर्माण क्षेत्र में फाइबर–प्रबलित कंक्रीट ईंटों का नवाचार किया गया। उभरती प्रौद्योगिकियों जैसे 3D फूड प्रिंटिंग तथा गुलाब की पंखुड़ियों से जैव सक्रिय यौगिकों के अल्ट्रासोनिक निष्कर्षण पर भी कार्य किया गया। तापीय प्रबंधन हेतु $MgO@ZrO_2$ नैनोकण आधारित रेडिएटिव कूलिंग कोटिंग्स का अध्ययन किया गया। डिजिटल कृषि के अंतर्गत चित्र आधारित आम वर्गीकरण तथा केला आपूर्ति श्रृंखला हेतु सेंसर–समेकित ब्लॉकचेन प्रणाली विकसित की गई। एक्स–रे एवं बायोस्पेकल चित्र द्वारा फलों के गैर–विनाशकारी गुणवत्ता मूल्यांकन में भी प्रगति हुई। जलवायु–स्मार्ट तकनीकों जैसे सौर कीट जाल, थर्मोइलेक्ट्रिक कूल क्रेट्स तथा माइक्रोकंट्रोलर आधारित सुखाने प्रणालियों का सफल प्रदर्शन किया गया।

संस्थान ने क्षमता निर्माण पर विशेष बल देते हुए लगभग 35 प्रशिक्षण एवं जागरुकता कार्यक्रम आयोजित किए, जिनसे 1,000 से अधिक प्रतिभागियों को लाभ हुआ। विस्तार गतिविधियों के अंतर्गत एक वाणिज्यिक स्तर की प्रसंस्करण इकाई की स्थापना की गई तथा सीफेट–आईफा (कृषि प्रसंस्करण पर उद्योग इंटरफेस मेला) 2025 का आयोजन किया गया, जिसके माध्यम से किसानों, उद्यमियों तथा अन्य हितधारकों तक प्रौद्योगिकियों का प्रसार किया गया। इस आयोजन में भा.कृ.अनु.प. संस्थानों एवं उद्योग भागीदारों के 50 से अधिक दुकानें शामिल रहे, जिससे सहयोग एवं ज्ञान आदान–प्रदान को बढ़ावा मिला।

संस्थान ने 79 शोध पत्रों के प्रकाशन सहित उत्कृष्ट अनुसंधान प्रदर्शन किया तथा इसके वैज्ञानिकों को अनेक पुरस्कार एवं सम्मान प्राप्त हुए। प्रौद्योगिकी व्यवसायीकरण के अंतर्गत 11 प्रौद्योगिकियों का 20 उद्यमियों को लाइसेंस प्रदान किया

गया, 8 पेटेंट दायर किए गए तथा 1 अंतरराष्ट्रीय पेटेंट प्राप्त हुआ। संस्थान ने उत्पादों की बिक्री, प्रशिक्षण कार्यक्रमों, खाद्य परीक्षण सेवाओं एवं प्रौद्योगिकी लाइसेंसिंग के माध्यम से लगभग 40.00 लाख रुपये का राजस्व अर्जित किया। इसके अतिरिक्त, कटाई उपरांत मशीनरी एवं उपकरण परीक्षण केंद्र (पीएचएमईटीसी) द्वारा 48 मशीनों का परीक्षण किया गया, जिससे लगभग 1.05 करोड़ रुपये का राजस्व प्राप्त हुआ।

अखिल भारतीय समन्वित अनुसंधान परियोजनाओं के अंतर्गत कटाई उपरांत प्रौद्योगिकियों में उल्लेखनीय प्रगति दर्ज की गई। कटाई उपरांत अभियांत्रिकी एवं प्रौद्योगिकी – अखिल भारतीय समन्वित अनुसंधान के तहत 63 विभिन्न उपकरण, मशीनें, प्रक्रिया प्रोटोकॉल, उत्पाद एवं प्रौद्योगिकियाँ विकसित कर 41 हितधारकों को स्थानांतरित की गईं। इसी प्रकार, कृषि संरचना और पर्यावरण प्रबंधन में प्लास्टिक इंजीनियरिग – अखिल भारतीय समन्वित अनुसंधान के अंतर्गत 11 प्रौद्योगिकियाँ विकसित कर 3 सफलतापूर्वक क्षेत्रीय स्तर पर अपनाई गईं।

संस्थान ने राष्ट्रीय एवं अंतरराष्ट्रीय स्तर पर अपनी पहुंच को सुदृढ़ किया तथा राजभाषा हिंदी के उपयोग को बढ़ावा दिया। साथ ही, स्वच्छ भारत मिशन एवं अनुसूचित जाति उप–योजना जैसे प्रमुख सरकारी कार्यक्रमों का प्रभावी क्रियान्वयन किया। भा.कृ.अनु.प. – सीफेट नवाचार एवं प्रभावी हस्तक्षेपों के माध्यम से फसलोत्तर अभियांत्रिकी के क्षेत्र में निरंतर प्रगति कर रहा है और उत्कृष्टता के प्रति अपनी प्रतिबद्धता के साथ भविष्य में और भी उच्च उपलब्धियाँ प्राप्त करने के लिए अग्रसर है।

(नचिकेत कोतवालीवाले)
निदेशक

PREFACE

I am pleased to present the Annual Report–2025 of the ICAR–Central Institute of Post-Harvest Engineering and Technology, Ludhiana. The report encapsulates the Institute's major activities, outreach initiatives, and key achievements during the year. The Institute remains committed to serving society through the development of innovative post-harvest technologies aimed at enhancing efficiency, minimizing losses, promoting value addition, fostering entrepreneurship for increased farmers' income, and ensuring effective utilization of agricultural by-products. It also provides a comprehensive account of contributions made under two All India Coordinated Research Projects (AICRPs) and one Consortium Research Platform (CRP).

During the year, the Institute delivered a diverse range of outputs, including advanced technologies, engineering solutions, and innovative food products, all developed through rigorous experimentation and validated scientific approaches. Significant progress was achieved in rapid food safety diagnostics through the development of a biosensor-based ELISA process for detecting Aflatoxin B1 in maize at very low levels (0.624 µg/kg), offering a quick alternative to conventional methods. Innovative processing technologies were also developed, including mini millet mills and grit-making machines for small-scale applications. Value-added food processes such as low-fat sorghum cookies, roasted brown rice infused green tea, vacuum-fried beetroot chips, fibre-enriched pasta, and buffalo meat pet snacks were standardized. Nutrient-rich products like makhana-based instant pasta, millet-based instant mixes, and tikhur drink were also formulated to promote dietary diversification. Engineering advancements included maize cob dryers, roasted makhana seed sorters and makhana seed collection system were developed. Construction innovations like fibre-reinforced concrete bricks were also introduced. Emerging technologies such as 3D food printing and ultrasound-assisted extraction of bioactive compounds from rose petals were explored. Advanced materials like MgO/ZrO_2 nanoparticle-based radiative cooling coatings were investigated for thermal management. Digital agriculture solutions included image-based mango sorting and sensor-integrated blockchain systems for banana supply chains. Non-destructive quality assessment using X-ray and biospeckle imaging enhanced fruit evaluation techniques. Climate-smart solutions such as solar insect traps, thermoelectric cool crates, and microcontroller-based drying systems were successfully demonstrated.

The Institute placed strong emphasis on capacity building, organizing around 35 training and outreach programmes that benefited over 1,000 participants, focusing on post-harvest management of agricultural and livestock produce. Outreach efforts included commissioning a commercial-scale processing unit and organizing CIPHET-IIFA 2025 (Industry Interface Fair on Agro Processing) which facilitated dissemination of technologies to farmers, entrepreneurs, and other stakeholders. The events featured over 50 stalls from ICAR institutes and industry partners, promoting collaboration and knowledge exchange.

The Institute demonstrated notable research excellence with the publication of 79 research papers in peer-reviewed journals, along with several awards and recognitions received by its scientists. Technology commercialization efforts resulted in the licensing of eleven technologies to twenty entrepreneurs, filing of eight patents, and grant of one international patent. The Institute generated revenue of approximately ₹40.00 lakh through sale of produce, training programmes, food testing services, and technology licensing. Additionally, the Post-Harvest Machinery and Equipment Testing Centre (PHMETC) evaluated 48 machines, generating revenue of about ₹1.05 crore.

Under the AICRP initiatives, significant advancements were recorded in post-harvest technologies. The AICRP on PHET led to the development of 63 various tools, equipment, process protocols, products and technologies which were transferred to 41 stakeholders. Similarly, under AICRP on PEASEM, 11 technologies were developed and 3 successfully transferred for field-level adoption.

The Institute also strengthened its national and international outreach and promoted the use of Hindi in official work. It actively implemented key government initiatives such as the Swachh Bharat Mission and Scheduled Caste Sub-Plan. ICAR-CIPHET continues to advance post-harvest engineering through innovation and impactful interventions, and with sustained commitment to excellence, it is poised to achieve greater milestones in the years ahead.

Nachiket Kotwaliwale
Director

कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद–केंद्रीय कटाई उपरांत अभियांत्रिकी एवं प्रौद्योगिकी संस्थान (भा.कृ.अनु.प.–सीफेट), जो भारत में कटाई उपरांत अभियांत्रिकी एवं प्रौद्योगिकी के उन्नयन हेतु समर्पित एक प्रमुख अनुसंधान संस्थान है। इस संस्थान ने वर्ष 2025 के दौरान उल्लेखनीय प्रगति प्राप्त की। संस्थान ने उन्नत प्रौद्योगिकियों के विकास तथा मौजूदा विधियों में सुधार पर ध्यान केंद्रित किया, जिससे कटाई उपरांत हानियों में कमी, प्रसंस्करण दक्षता में वृद्धि तथा कृषि उत्पादों की गुणवत्ता प्रबंधन सुनिश्चित किया जा सके। अनुसंधान को व्यावहारिक लाभों में परिवर्तित करने के महत्व को ध्यान में रखते हुए, भा.कृ.अनु.प.–सीफेट ने किसानों, उभरते कृषि–प्रसंस्करण उद्यमियों तथा औद्योगिक इकाइयों तक अपनी तकनीकों के प्रभावी प्रसार पर विशेष बल दिया।

प्रौद्योगिकी एवं ज्ञान हस्तांतरण को सुदृढ़ करने हेतु संस्थान ने बहुआयामी रणनीति अपनाई। विकसित तकनीकों के वाणिज्यीकरण और व्यापक उपयोग के लिए प्रौद्योगिकी लाइसेंसिंग को प्रोत्साहित किया गया। किसानों, उद्यमियों एवं अन्य हितधारकों को व्यावहारिक कौशल एवं तकनीकी ज्ञान प्रदान करने हेतु संरचित प्रशिक्षण कार्यक्रम आयोजित किए गए। इसके अतिरिक्त, मानव संसाधन विकास को सुदृढ़ करने एवं कृषि क्षेत्र में योगदान की क्षमता बढ़ाने के लिए क्षमता निर्माण पहलें लागू की गईं। विभिन्न क्षेत्रों में विस्तार गतिविधियाँ भी संचालित की गईं, ताकि संस्थान की तकनीकें दूरस्थ क्षेत्रों सहित विविध कृषक समुदायों तक पहुँच सकें।

वर्ष के दौरान संस्थान का अनुसंधान पोर्टफोलियो कटाई उपरांत क्षेत्र की प्रमुख चुनौतियों के समाधान के प्रति उसकी प्रतिबद्धता को दर्शाता है। आंतरिक एवं बाह्य वित्तपोषित परियोजनाओं के माध्यम से, भा.कृ.अनु.प.–सीफेट ने कृषि उत्पादों के भंडारण, प्रसंस्करण एवं प्रबंधन में सुधार हेतु नवाचारी समाधान विकसित किए। इन प्रयासों से कटाई उपरांत हानियों में कमी, खाद्य उत्पादों की गुणवत्ता एवं सुरक्षा में सुधार तथा खाद्य प्रणाली की स्थिरता को मजबूती मिली। अनुसंधान गतिविधियाँ विभिन्न फसलों एवं उत्पादों पर केंद्रित रहीं, जिनमें भंडारण, प्रसंस्करण एवं मूल्य संवर्धन से संबंधित विशिष्ट समस्याओं का समाधान किया गया।

वर्ष 2025 में, भा.कृ.अनु.प.–सीफेट ने भारत के कृषि क्षेत्र में नवाचार के एक महत्वपूर्ण प्रेरक के रूप में अपनी भूमिका को और सुदृढ़ किया। संस्थान ने न केवल तकनीकी समाधान विकसित किए, बल्कि एक अधिक दक्ष एवं टिकाऊ कटाई उपरांत पारिस्थितिकी तंत्र के निर्माण की दिशा में भी कार्य किया। इसकी पहलों ने पर्यावरण–अनुकूल प्रथाओं को बढ़ावा दिया, मूल्य संवर्धित उत्पादों के विकास को प्रोत्साहित किया तथा किसानों, प्रसंस्करणकर्ताओं एवं उपभोक्ताओं के बीच संबंधों को मजबूत किया। इसके अतिरिक्त, संस्थान ने तकनीकी सहायता एवं प्रशिक्षण प्रदान कर कृषि–प्रसंस्करण क्षेत्र में उद्यमिता को बढ़ावा देने तथा रोजगार सृजन में महत्वपूर्ण योगदान दिया। विस्तार कर्मियों, शोधकर्ताओं एवं नीति–निर्माताओं के क्षमता निर्माण पर भी विशेष बल दिया गया, ताकि अनुसंधान निष्कर्षों का व्यापक एवं प्रभावी उपयोग सुनिश्चित हो सके। भविष्य में, भा.कृ.अनु.प.–सीफेट अत्याधुनिक अनुसंधान, प्रौद्योगिकी विकास एवं हितधारक सहभागिता के माध्यम से कटाई उपरांत क्षेत्र में नवाचार को आगे बढ़ाने के लिए प्रतिबद्ध है। यह प्रतिवेदन भा.कृ.अनु.प.–सीफेट एवं इसके सहयोगी संस्थानों द्वारा कटाई उपरांत प्रसंस्करण, मूल्य संवर्धन एवं कृषि अभियांत्रिकी के क्षेत्रों में प्राप्त प्रमुख अनुसंधान उपलब्धियों को प्रस्तुत करता है।

भा.कृ.अनु.प.–सीफेट ने कटाई उपरांत हानियों को न्यूनतम करने, मूल्य संवर्धन बढ़ाने, खाद्य सुरक्षा सुनिश्चित करने तथा कृषि मूल्य श्रृंखलाओं को सुदृढ़ करने हेतु अनुसंधान एवं प्रौद्योगिकी विकास को निरंतर आगे बढ़ाया। खाद्य सुरक्षा के क्षेत्र में तीव्र निदान तकनीकों का विकास किया गया, जिसमें मक्का में अफ्लाटॉक्सिन बी1 की पहचान हेतु बायोसेंसर आधारित ELISA प्रक्रिया शामिल है, जो अत्यंत कम स्तर (0.624 µg/kg) पर भी संदूषण का पता लगाने में सक्षम है।

संस्थान ने प्रसंस्करण के क्षेत्र में भी नवाचारी तकनीकों का विकास किया, जैसे कि लघु मिलेट मिल, ग्रिट बनाने की

मशीनें, कम वसा युक्त ज्वार बिस्कुट, ब्राउन राइस आधारित ग्रीन टी, वैक्यूम–फ्राइड चुकंदर चिप्स, फाइबर युक्त पास्ता एवं भैंस मांस आधारित पालतू आहार उत्पाद। इसके अतिरिक्त, मखाना आधारित इंस्टेंट पास्ता, मिलेट आधारित इंस्टेंट मिश्रण एवं टिक्खुर पेय जैसे मूल्य संवर्धित उत्पादों का मानकीकरण किया गया।

अभियांत्रिकी एवं यंत्रीकरण के क्षेत्र में मक्का भुट्टा ड्रायर, डबल–हेड मक्का/स्वीट कॉर्न सीड शेलर, स्वचालित मखाना बीज छंटाई प्रणाली, नारियल चिप्स हेतु रोटरी ड्रायर–कम–फ्लेवर कोटिंग मशीन तथा फाइबर–प्रबलित कंक्रीट ईंटों का विकास किया गया। उभरती तकनीकों जैसे 3D फूड प्रिंटिंग, गुलाब की पंखुड़ियों से बायोएक्टिव यौगिकों का अल्ट्रासोनिक निष्कर्षण तथा $MgO@ZrO_2$ नैनोपार्टिकल आधारित कूलिंग कोटिंग्स का भी अध्ययन किया गया।

डिजिटल एवं स्मार्ट कृषि समाधान के अंतर्गत आम की इमेज–आधारित ग्रेडिंग प्रणाली, केले के लिए सेंसर एवं ब्लॉकचेन आधारित आपूर्ति श्रृंखला तथा फलों की गुणवत्ता के गैर–विनाशकारी परीक्षण हेतु एक्स–रे एवं बायोस्पेकल इमेजिंग तकनीकों का विकास किया गया। नवीकरणीय ऊर्जा आधारित एवं जलवायु–स्मार्ट समाधानों में सौर कीट ट्रैप, थर्मोइलेक्ट्रिक कूल क्रेट एवं माइक्रोकंट्रोलर आधारित सुखाने की प्रणालियाँ शामिल हैं।

फील्ड प्रदर्शन, कृषि ड्रोन अनुप्रयोग, मूल्य श्रृंखला विकास एवं ऑन–फार्म तकनीकों के माध्यम से संस्थान ने कटाई उपरांत हानियों में कमी, किसानों की आय में वृद्धि तथा सतत कृषि–खाद्य प्रणालियों को बढ़ावा देने में महत्वपूर्ण योगदान दिया।

प्रतिवेदन अवधि के दौरान, संस्थान ने समीक्षित पत्रिकाओं में 79 शोध पत्र प्रकाशित किए, जो कटाई उपरांत अभियांत्रिकी एवं खाद्य प्रसंस्करण में वैज्ञानिक प्रगति के प्रति इसकी प्रतिबद्धता को दर्शाता है। संस्थान ने 35 प्रशिक्षण कार्यक्रम आयोजित किए, जिनका उद्देश्य किसानों, उद्यमियों एवं हितधारकों को कृषि–प्रसंस्करण, मूल्य संवर्धन एवं कटाई उपरांत प्रबंधन के ज्ञान से सशक्त बनाना था।

कृषि विज्ञान केंद्र (केवीके) गतिविधियों के माध्यम से ऑन–फार्म प्रदर्शन, अग्रिम पंक्ति परीक्षण एवं परामर्श सेवाओं द्वारा तकनीकों का प्रभावी प्रसार किया गया। इसके अतिरिक्त, एग्री–बिजनेस इन्क्यूबेशन सुविधाओं के अंतर्गत पाँच से अधिक इनक्यूबेटरों को तकनीकी मार्गदर्शन एवं अवसंरचना सहायता प्रदान की गई।

संस्थान ने विभिन्न सम्मेलन, कार्यशालाएँ एवं हितधारक संवाद आयोजित कर ज्ञान प्रसार, नई तकनीकों का प्रदर्शन एवं शोधकर्ताओं, उद्योग, किसानों एवं नीति–निर्माताओं के बीच सहयोग को सुदृढ़ किया। ये सभी पहलें नवाचार को बढ़ावा देने, प्रौद्योगिकी अपनाने तथा कृषि मूल्य श्रृंखला में ज्ञान आदान–प्रदान को सुदृढ़ करने में सहायक सिद्ध हुई हैं।

Executive Summary

The Indian Council of Agricultural Research – ICAR-Central Institute of Post-Harvest Engineering and Technology (ICAR-CIPHET), a premier research institute dedicated to advancing post-harvest engineering and technology in India, achieved notable progress during 2025. The institute focused on developing advanced technologies and improving existing methods to reduce post-harvest losses, enhance processing efficiency and ensure quality management of agricultural produce. Recognizing the importance of translating research into practical benefits, ICAR-CIPHET emphasized the effective dissemination of its innovations to a wide range of stakeholders, including farmers, emerging entrepreneurs in agro-processing and established industries aiming to improve operational efficiency.

To strengthen technology and knowledge transfer, the institute adopted a multi-pronged strategy. Technology licensing was actively promoted to facilitate commercialization and wider adoption of developed innovations. Structured training programmes were conducted to equip farmers, entrepreneurs and other stakeholders with practical skills and technical knowledge. In addition, capacity-building initiatives were implemented to enhance human resource development and strengthen the ability of stakeholders to contribute to the agricultural sector. Extension activities were also carried out across different regions to ensure that ICAR-CIPHET's technologies and research outcomes reached diverse farming communities, including those in remote areas.

The institute's research portfolio during the year reflected its strong commitment to addressing key challenges in the post-harvest sector. Through both internally funded and externally supported projects, ICAR-CIPHET developed innovative solutions to improve post-harvest handling, processing and storage of agricultural commodities. These efforts contributed to reducing post-harvest losses, improving the quality and safety of food products and strengthening the sustainability of the food system. Research activities covered a wide range of crops and commodities, focusing on commodity-specific challenges related to storage, processing and value addition.

In 2025, ICAR-CIPHET further reinforced its role as an important driver of innovation in India's agricultural sector. The institute not only developed technological solutions but also worked towards building a more efficient and sustainable post-harvest ecosystem. Its initiatives promoted environmentally sustainable practices, supported the development of value-added products and strengthened linkages among farmers, processors and consumers. In addition, ICAR-CIPHET played an important role in encouraging entrepreneurship and generating employment opportunities in the agro-processing sector by providing technical support and training to aspiring entrepreneurs. The institute also emphasized capacity building among extension personnel, researchers and policymakers to ensure wider dissemination and effective utilization of research outputs. Looking ahead, ICAR-CIPHET remains committed to advancing innovation in the post-harvest sector through cutting-edge research, technology development and stakeholder engagement. By fostering collaborations and strategic partnerships, the institute aims to develop solutions that are technologically sound, economically viable and socially relevant, thereby contributing to a more resilient and sustainable agricultural system in India.This report presents key research achievements of ICAR-CIPHET and its collaborating institutions in the areas of post-harvest processing, value addition and agricultural engineering.

ICAR-CIPHET continued to advance research and technology development aimed at minimizing post-harvest losses, improving value addition, ensuring food safety, and strengthening agri-value chains. Significant progress was made in the development of rapid food safety diagnostics, including a biosensor-based ELISA process for detection of Aflatoxin B1 in maize, capable of detecting contamination at very low levels (0.624 µg/kg), providing a rapid alternative to conventional analytical techniques.

The institute also developed innovative processing technologies such as small prototypes of mini millet mills and grit-making machines, and processes for low-fat sorghum cookies, roasted brown rice infused green tea, vacuum-fried beetroot chips, fibre-enriched pasta, and buffalo meat pet snacks. Value-added

products including makhana-based instant pasta, millet-based instant mixes, and tikhur drink were standardized to promote nutritious and diversified food products.

Advancements in engineering and mechanization included development of maize cob dryers, double-head maize/sweet corn seed shellers, automatic roasted makhana seed sorting systems, rotary dryer-cum-flavour coating machines for coconut chips, and fibre-reinforced concrete bricks. Emerging technologies such as 3D food printing, ultrasound-assisted extraction of bioactive compounds from rose petals, and MgO/ZrO nanoparticle-based passive daytime radiative cooling coatings were also explored.

Digital and smart agriculture solutions were strengthened through image-based mango sorting systems, sensor-based monitoring integrated with blockchain-enabled supply chains for banana, and non-destructive quality assessment using X-ray and biospeckle imaging for fruits. Renewable energy-based and climate-smart solutions such as solar insect traps, thermoelectric cool crates, and microcontroller-based drying systems were also developed.

Through field demonstrations, agri-drone applications, value chain development, and adoption of on-farm technologies, ICAR-CIPHET and its network centers contributed to reducing post-harvest losses, enhancing farmers' income, and promoting sustainable agri-food systems in line with the vision of Viksit Bharat.

During the reporting period, the Institute published 79 research papers in peer-reviewed journals, reflecting its strong commitment to scientific advancement in post-harvest engineering and food processing. ICAR-CIPHET has continued to play a pivotal role in strengthening the agricultural and food processing sectors through a wide range of research, capacity building, and technology dissemination activities. The Institute organized over 35 training programmes aimed at empowering farmers, entrepreneurs, and stakeholders with knowledge on agro-processing, value addition, and post-harvest management, thereby contributing directly to livelihood enhancement and income generation. The Krishi Vigyan Kendra (KVK) activities further facilitated effective technology transfer through on-farm demonstrations, frontline trials, and advisory services, ensuring wider adoption of improved post-harvest technologies at the grassroots level.

In addition, the Institute's Agri-Business Incubation (ABI) facilities supported more than five incubators, providing technical guidance, infrastructure support, and mentorship to promote start-ups and accelerate the commercialization of innovative agro-processing technologies. The Institute also organized several conferences, workshops, and stakeholder interactions to disseminate knowledge, showcase emerging technologies, and strengthen collaboration among researchers, industry, farmers, and policy makers. These initiatives have significantly contributed to fostering innovation, promoting technology adoption, and enhancing knowledge exchange across the agricultural value chain.


कृपया वाहन धीरे चलाएं
ICAR CIPHET
Estd 1989

VISION AND MISSION

VISION

Higher profitability of agricultural production systems ensuring better income to farmers and increased employment opportunities in rural sector through efficient post-harvest engineering and technological interventions for loss reduction and value addition to agricultural produce and byproducts resulting in high quality and safe food and feed at competitive prices for domestic and export markets.

MISSION

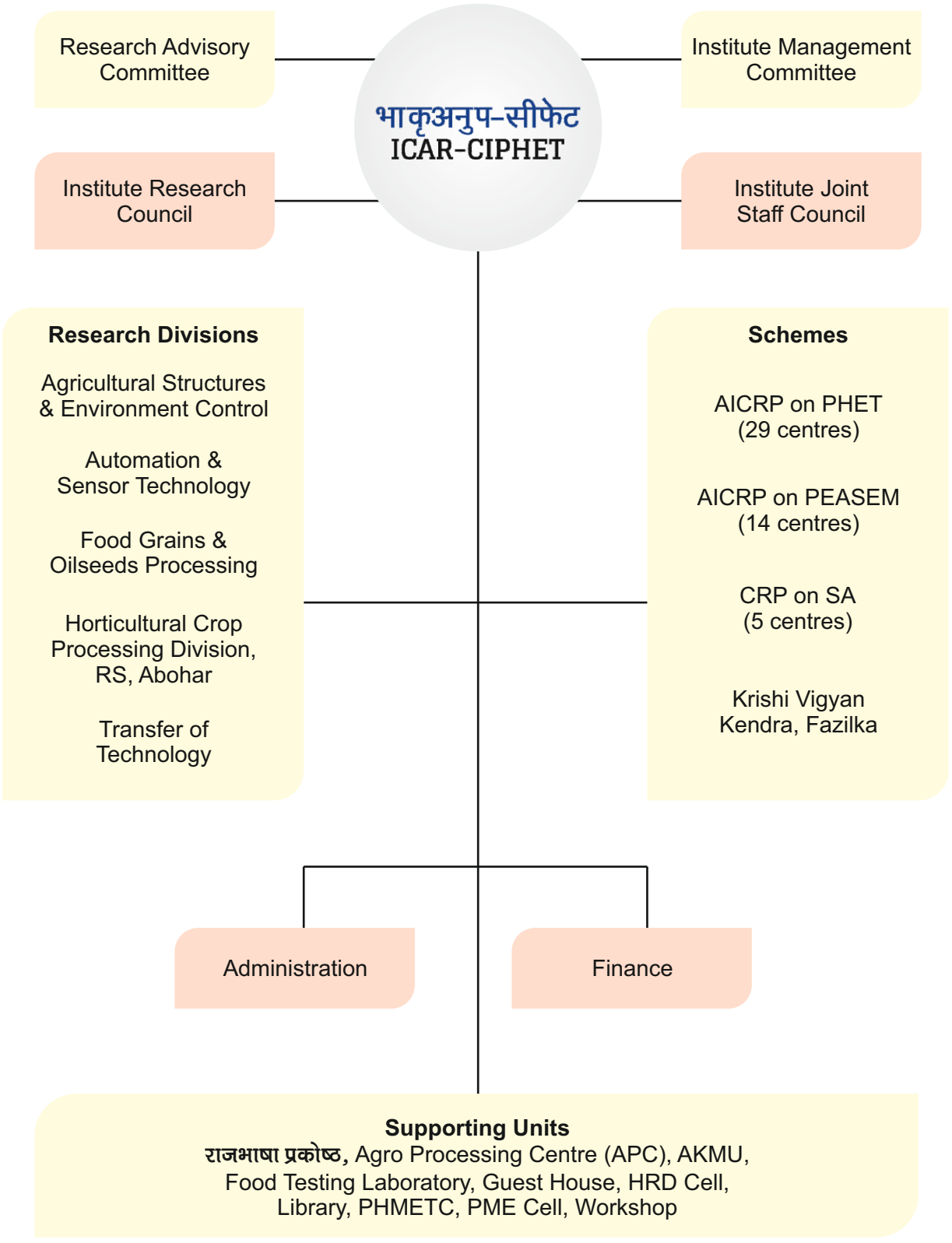
Envisaging prosperity through minimization of post-harvest losses from 15% to 5% and increase in value addition from present level of 10% to 30% to produce and by-products from crops, horticulture, livestock and fisheries sectors.

MANDATE

Research on post-harvest processing, preservation, storage and value addition of agricultural commodities.

Human resource and entrepreneurship development in post-harvest engineering and technology.

ORGANOGRAM


Research Advisory Committee
Institute Management Committee
भाकृअनुप–सीफेट
ICAR-CIPHET
Institute Research Council
Institute Joint Staff Council
Research Divisions
Agricultural Structures & Environment Control
Automation & Sensor Technology
Food Grains & Oilseeds Processing
Horticultural Crop Processing Division, RS, Abohar
Transfer of Technology
Schemes
AICRP on PHET (29 centres)
AICRP on PEASEM (14 centres)
CRP on SA (5 centres)
Krishi Vigyan Kendra, Fazilka
Administration
Finance
Supporting Units
राजभाषा प्रकोष्ठ, Agro Processing Centre (APC), AKMU, Food Testing Laboratory, Guest House, HRD Cell, Library, PHMETC, PME Cell, Workshop

Overview

Established on 3 October 1989 in Ludhiana, Punjab, with a secondary campus at Abohar inaugurated on 19 March 1993, ICAR-CIPHET is India's premier institute dedicated to post-harvest engineering and value addition technologies. The institute's mission is to undertake innovative research addressing the specific needs of agricultural regions and processing industries.

As the only institute in India solely focused on applied post-harvest technologies, ICAR-CIPHET directly supports farmers, orchardists, rural youth, and entrepreneurs by developing practical solutions and value-added applications for agricultural commodities. It also leads two All India Coordinated Research Projects (AICRPs): Post-Harvest Engineering and Technology (PHET) and Plastic Engineering in Agriculture, Structures, and Environment Management (PEASEM), coordinating nationwide research efforts.

The institute operates through four divisions and one regional station:

1. Agricultural Structures and Environmental Control
2. Automation and Sensor Technology
3. Food Grains and Oilseeds Processing
4. Transfer of Technology
5. Regional Station, Abohar

ICAR-CIPHET has developed over 120 technologies, including advanced food processing equipment, storage solutions, and high-value processing protocols. So far, 68 technologies have been successfully commercialized or licensed to 190 entrepreneurs and end-users, demonstrating significant impact on the agricultural value chain.

The institute addresses critical post-harvest challenges, including protected cultivation, improved threshing and milling, efficient processing, enhanced storage, non-destructive quality evaluation, functional foods, and food safety. By reducing post-harvest losses, adding value to produce, and optimizing by-product use, ICAR-CIPHET has increased rural incomes and generated employment opportunities.

Its commitment to innovation is reflected in 78 patents filed, 33 granted, and the establishment of the Agri-Business Incubation Centre and Post-Harvest Machinery and Equipment Testing Centre, reinforcing its role in advancing agricultural development and technology adoption.

All India Co-ordinated Research Projects (AICRP) on Post-Harvest Engineering and Technology (PHET)

The Indian Council of Agricultural Research (ICAR) launched the All India Coordinated Research Project on Post-Harvest Engineering and Technology in September 1972. Currently operational across 29 centers in various states and agro-climatic zones of India, the project aims to develop post-harvest technologies and equipment suited to specific crops and locations. Its primary goal is to minimize both quantitative and qualitative post-harvest losses while also exploring opportunities for creating value-added products from agricultural crops, livestock, and their byproducts.

The key activities of the project include:

1. Adoption and development of equipment and technologies to reduce post-harvest losses at critical stages and operations.
2. Establishment of need-based Agro Processing Centres (APCs) in different production areas to enhance income and generate employment.
3. Development of value-added products from agricultural crops and commodities.
4. Prototype development and process optimization to create comprehensive packages for post-harvest utilization of crops, commodities, and their byproducts.
5. Conducting multi-location trials and demonstrations of post-harvest technologies.

All India Co-ordinated Research Projects (AICRP) on Plastic Engineering in Agriculture Structures & Environment Management (PEASEM)

The All India Coordinated Research Project (AICRP) on Plastic Engineering in Agriculture Structures & Environment Management (PEASEM), formerly known as the AICRP on Application of Plastics in Agriculture (APA), was established in 1988. The project is implemented through a network of 14 centres, comprising six ICAR institutes, seven State Agricultural Universities (SAUs), and one Central Agricultural University (CAU).

PEASEM has made significant contributions to the development and improvement of plasticulture technologies through focused research and innovation. Its work spans a wide range of areas, including water harvesting and management, protected and surface-cover cultivation, irrigation systems, plastic mulching, animal housing, aquaculture technologies, and the application of plastics in farm implements, machinery, post-harvest handling, and packaging.

The project has demonstrated a strong positive impact at the farm level, notably by enhancing income per unit area and achieving substantial savings in critical inputs such as water, fertilizers, and labour.

Objectives:

1. To apply plastics in agriculture, both in production agriculture and post-harvest management.
2. To identify new areas of plastics applications in agriculture, particularly in inland fisheries, and animal shelters and environment control.
3. To carry out operational research on laboratory proven technologies at pilot level with area saturation approach.
4. To disseminate plasticulture technologies through publications, media, exposure and training programmes, workshops, developing linkages with industry, other stakeholders and catalyzing developmental programmes.

Consortia Research Platform on Secondary Agriculture (CRP on SA)

The Consortia Research Platform (CRP) on Secondary Agriculture was launched in 2015 as a project-based initiative with a modest budget. Now operating through four centres across different states, the project emphasizes the comprehensive utilization of biomass generated from agricultural production by promoting processing and value addition. This strategy seeks to enhance farmers' income, reduce waste, and contribute to improved livelihoods and a cleaner environment. The scheme has recorded notable achievements, including the development and commissioning of pilot plants for Makhana, the development and licensing of several value-added products, and the establishment of Agro Processing Centres (APCs).

Krishi Vigyan Kendra, Fazilka

The Krishi Vigyan Kendra (KVK), Abohar, located in the Fazilka district of Punjab, plays a vital role in accelerating the transfer of agricultural technologies from research institutions to farmers' fields. Situated in the south-western part of the state, the KVK serves a strategically important region that shares inter-state boundaries with Haryana and Rajasthan and an international border with Pakistan. Owing to this unique geographical setting, the centre acts as a key platform for addressing diverse agro-climatic challenges while catering to a wide farming community. The core mandate of the KVK is to bridge the gap between research and field application by ensuring effective last-mile delivery of scientific knowledge and agricultural innovations. In this regard, the KVK conducts On-Farm Trials (OFTs) to evaluate and refine technologies under local conditions and organizes Frontline Demonstrations (FLDs) to showcase validated technologies directly on farmers' fields. In addition, it undertakes various extension activities such as field days, Kisan Melas, Kisan Gosthis (farmer–scientist interactions), training programmes, awareness campaigns, and expert lectures to enhance farmers' knowledge, skills, and adoption of improved practices. Recognizing the increasing importance of value addition and the need to reduce post-harvest losses, the KVK Abohar places special emphasis on post-harvest management and farm-level processing. The centre promotes scientific handling, storage, processing, and marketing of agricultural produce to improve farmers' income and minimize wastage. By integrating traditional farming practices with modern technologies, the KVK strives to promote sustainable and profitable agriculture, thereby contributing significantly to the socio-economic development of the farming community in the region.

Infrastructure

Workshop

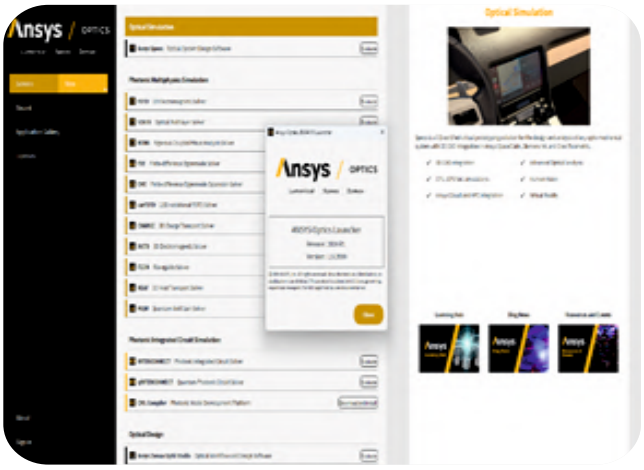
The Ludhiana and Abohar campuses of ICAR-CIPHET have a workshop where post-harvest machinery tools & equipments are manufactured. They have a wide range of advanced tools in the workshop. The workshop is equipped with equipment and machinery for the fabrication, maintenance and repair of post-harvest machinery and its components. The key functions of the workshop include prototyping, building projects and developing problem-solving capabilities through practical application of engineering principles. The workshop staffs also provide necessary support services to develop the institute's infrastructure and machinery for suitable use. The workshop is well equipped with machinery like machining, fitting, welding and sheet metal work. Here they also provide training to students from all over India, where they trained in processes like machining, fitting, welding and sheet metal work, allowing students to build and refine their practical skills.

Library

ICAR-CIPHET serves as an important knowledge and information hub aligned with the institute's mandate. The library maintains a well-stocked collection of books and journals covering post-harvest engineering, food processing, engineering, microbiology, biochemistry, biotechnology, and related disciplines. During the year under report, the library housed a total of 5,448 books and standards. As a member of the Consortium for e-Resources in Agriculture (CeRA), the library provides access to a wide range of online full-text journals and e-books. In addition, several national and international serial publications, annual reports, newsletters, and research bulletins received on a complimentary basis are available to readers. The library regularly circulates current contents of journals and lists of new arrivals among ICAR-CIPHET staff. During the year, the library subscribed to one Punjabi, one Hindi, and one English newspaper—Ajit, Dainik Jagran, and The Tribune, respectively—and received the Employment Newspaper, Science Reporter (English), Grehshobha (English), and India Today (both Hindi and English). Library facilities are extended to trainees from various organizations across different parts of the country.

Agricultural Knowledge Management Unit (AKMU)

The Agricultural Knowledge Management Unit (AKMU) at ICAR-CIPHET provides IT, networking, and digital support for research and administrative activities. The Unit maintains IT infrastructure, LAN and Wi-Fi connectivity across the institute and residential campus and assists in procurement of hardware and software. High-speed internet connectivity is ensured through 1 Gbps NKN and 300 Mbps BSNL optical fiber links, along with management of the EPABX system. AKMU administers licensed, security, and scientific software including MS Office, Adobe and Corel suites, Quick Heal Antivirus, Netbero Internet Management Solution, Aadhaar-based Biometric Attendance System, ANSYS, MATLAB, and Design-Expert. The Unit also provides technical support for the Conference Hall, virtual meetings, IRC and RAC meetings, and maintains the ICAR-CIPHET website (ciphet.res.in), which was remapped and hosted on the ERNET server during the year.



Guest House

The ICAR-CIPHET campuses—Ludhiana and Abohar—provide guest house accommodation for personnel from ICAR, State Agricultural Universities (SAUs), government organizations, and farmers. In addition, the Ludhiana campus houses an International Training Centre with eight air-conditioned rooms and a dining hall with an attached kitchen, designed to meet diverse training and lodging requirements.

Agro Processing Centre (APC)

Agro-processing centres significantly contribute to rural economic development by generating employment and increasing income through local value addition of agricultural produce. ICAR-CIPHET has set up a small-scale agro-processing center focused on processing crops such as black gram, green gram, black pepper, turmeric, coriander, and others. The processed products are sold to consumers within and around the institute. In addition, the center functions as an important training facility for prospective rural entrepreneurs, providing them with practical skills and knowledge to start and manage their own agro-processing enterprises.

Institute Technology Management Unit (ITMU)

The Institute Technology Management Unit (ITMU) of ICAR-CIPHET is entrusted with the protection, management, and commercialization of intellectual property (IP) generated through the institute's research activities. It plays a crucial role in promoting and accelerating the development of advanced technologies in the field of post-harvest management. By effectively linking research outputs with practical applications, ITMU enables the conversion of innovative ideas, inventions, and technologies into commercially viable solutions that address societal needs. Since its inception, ITMU has been actively involved in safeguarding and managing the institute's intellectual assets. So far, it has filed 78 patent applications, of which 33 have been granted. Through sustained and focused efforts, ITMU has successfully enabled the commercialization of 68 technologies developed at ICAR-CIPHET.

Agri-Business Incubation (ABI)

ICAR's Agri-Business Incubation Centers (ABICs) play a vital role in empowering farmers, entrepreneurs, and unemployed individuals by promoting innovation and supporting the development of new agricultural technologies and machinery. These centers provide access to advanced agricultural solutions along with need-based, customized support services. ABICs serve a wide spectrum of beneficiaries, including farmers, entrepreneurs, unemployed youth, women entrepreneurs, and small and medium enterprises. Through this holistic support framework, ABICs enable the effective adoption of agro-based technologies developed by ICAR-CIPHET, creating opportunities for income generation and employment in the agricultural sector.

Post-Harvest Machinery & Equipment Testing Centre (PHMETC)

The Post-Harvest Machinery and Equipment Testing Centre (PHMETC) at ICAR-CIPHET, Ludhiana is officially authorized by the Government of India to carry out rigorous testing of a broad range of post-harvest machinery and equipment. This accreditation enables PHMETC to ensure that manufacturers deliver high-quality, safe, and reliable equipment to end-users. Through the establishment of PHMETC, ICAR-CIPHET seeks to create a credible and trusted platform that instills confidence among manufacturers, buyers, and entrepreneurs engaged in post-harvest technologies. PHMETC undertakes comprehensive evaluation of machinery used in the processing of agricultural and allied products, thereby supporting the development, standardization, and adoption of efficient and dependable post-harvest solutions.

Regional Station, Abohar

The Regional Station, the institute's second campus, was established on 19 March 1993 at Abohar. It is dedicated to advancing post-harvest technology and controlled environment agriculture. Its major programs address several critical areas, including the assessment and reduction of post-harvest losses across various commodities; the development of improved packaging solutions to extend shelf life and facilitate the transport of perishable goods; the application of high-pressure processing to preserve the nutritional value and quality of fruit and vegetable products; the optimization of greenhouse designs and environmental control systems for different agro-ecological zones; the development of predictive models for greenhouse environments; the design of low-cost micro-irrigation systems for efficient water and nutrient management; and the development of effective dryers for high-value crops. Collectively, these initiatives aim to enhance agricultural sustainability and productivity in the region.

Staff Position (as on 31 Dec 2025)

ICAR-CIPHET, Ludhiana

Category	Sanctioned Strength	Filled	Vacant
Director (RMP Post)	01	01	00
Scientific	65	39	26
Administrative	37	20	17
Technical	23	15	08
Supporting	02	01	01
Total	**128**	**76**	**52**

ICAR-CIPHET, Regional Station, Abohar

Category	Sanctioned Strength	Filled	Vacant
Scientific	12	04	08
Administrative	04	01	03
Technical	08	05	03
Supporting	01	01	00
Total	**25**	**11**	**14**

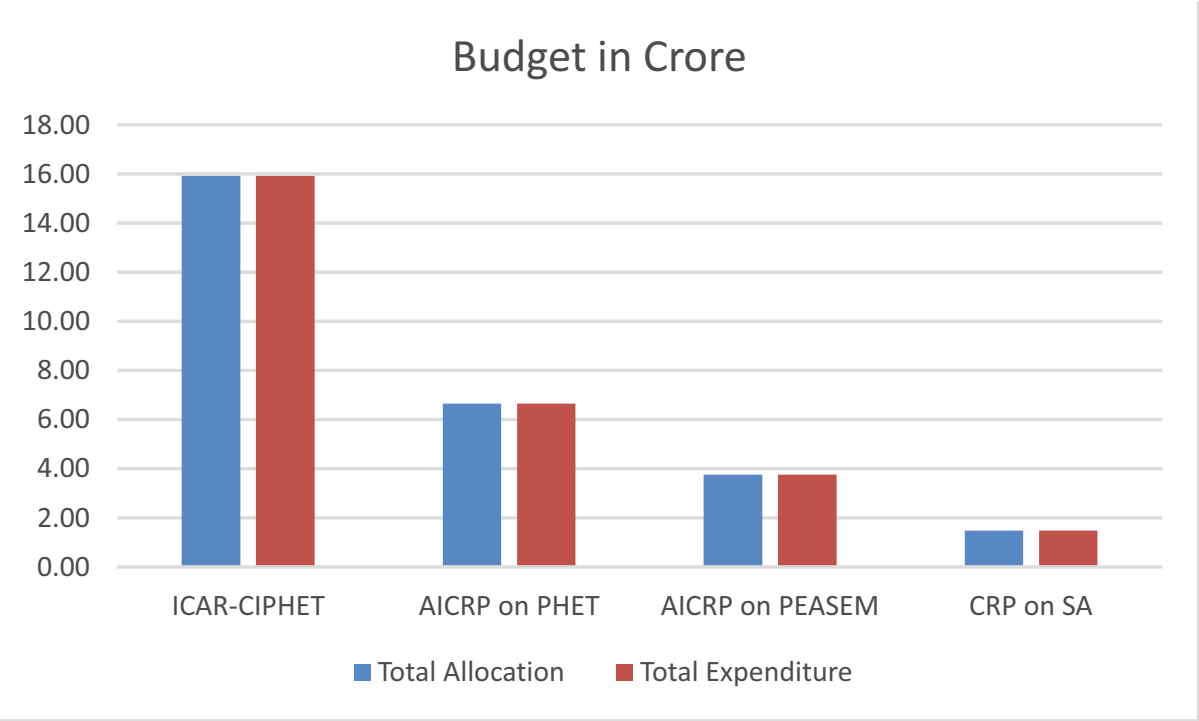
KVK, Fazilka, Abohar

Category	Sanctioned Strength	Filled	Vacant
Programme Coordinator /Senior Scientist & Head	01	01	00
Subject Matter Specialist/T-6	06	04	02
Farm Manager/T-4	01	00	01
Program Assistant (Computer)/ T -4	01	00	01
Program Assistant (Lab. Tech.)/ T -4	01	00	01
Assistant	01	01	00
Stenographer Grade-III	01	00	01
Driver	02	00	02
Skilled Support Staff	02	00	02
Total	**16**	**06**	**10**

Budget (Rs. in Crore)

Financial Year 2024-25

Scheme	Approved Allocation	Total Expenditure	Budget Utilization (%)
ICAR-CIPHET	15.92	15.92	100%
AICRP on PHET	6.66	6.66	100%
AICRP on PEASEM	3.76	3.76	100%
CRP on SA	1.49	1.49	100%



Revenue Generation (2024-25)

Scheme	Net Revenue Generated (Rs. in Crore)
ICAR-CIPHET	1.17

Research Highlights

ICAR-CIPHET

Machines/Equipment

Mini Millet Mill

A compact mini millet mill was designed, fabricated and evaluated for decentralized farm/village-level processing. Millets, rich in dietary fibre (8–12%), protein (7–11%) and micronutrients (iron 3–9 mg/100 g, calcium up to 344 mg/100 g in finger millet), face utilization constraints due to dehulling and polishing challenges. The developed unit integrates a feed hopper, abrasive emery roller dehulling chamber, blower-assisted aspiration and graded sieve assembly on a mild-steel frame, driven by a 1 hp single-phase motor (900–1200 rpm). Using factorial experimental design, feed rate (15–40 kg h^{-1}), roller aclearance (1.0–2.5 mm) and grain moisture (9–12%, w.b.) were optimized. At 9% moisture, 30 kg h^{-1} feed rate and 1.5 mm clearance, the mill achieved 92.4 ± 1.6% dehulling efficiency, 68.7 ± 1.2% milling recovery and <7.8% broken grains. Head grain recovery improved by 12–18% over conventional abrasive mills. The prototype demonstrates low energy requirement, compactness and improved processing efficiency, supporting on-farm value addition, loss reduction and millet-based nutritional security.

Fig. 1. Mini millet mill

Millet Grit Making Machine

A millet grit making machine was developed to produce standardized grits for extrusion-based value-added products. The machine consists of a feed hopper, screw pitch barrel, serrated roller-based size reduction unit and vibratory sieve grading assembly in a mild-steel frame, powered by a 1 hp variable-speed DC motor (600–1200 rpm). Response surface methodology was used to optimize grain moisture (10–16%, w.b.), roller clearance (0.5–2.0 mm) and feed rate (20–60 kg h^{-1}). At 13% moisture, 1.0 mm clearance and 45 kg h^{-1} feed rate, grit recovery reached 78.6 ± 1.4%, with predominant particle size 500–850 µm and coefficient of variation below 8%. The system provides controlled size reduction and uniform particle size critical for extrusion performance, ensuring desirable physicochemical properties and nutritional integrity. It is suitable for rural millet processing units and small-scale extrusion industries targeting functional snacks.

Fig. 2. Millet grit making machine

Development and Performance Evaluation of Fibre-Reinforced Concrete Bricks

Under the Consortia Research Platform-Natural Fiber initiative, M20 grade concrete paver blocks (8″ × 8″ × 80 mm) reinforced with jute were developed and evaluated for compressive behaviour and crack control. Reinforcement configurations included single, double and triple jute mesh layers at defined

depths and alkali-treated scattered fibres at controlled dosages. Control blocks (Mark C) exhibited brittle failure with mean compressive strength of 53.0 ± 7.0 MPa. Jute mesh reinforcement altered both strength and failure mode: single-mesh samples (SMM, SMU, SMB) achieved 38.86 ± 6.01, 47.40 ± 3.65 and 44.44 ± 2.46 MPa with improved post-crack cohesion; double-mesh layouts (DM224, DM422, DM242) recorded 40.68 ± 2.69, 45.78 ± 4.48 and 49.16 ± 5.41 MPa with reduced spalling and better residual integrity. Scattered fibre bricks at 7.5, 15 and 22.5 g showed 41.58 ± 5.08, 57.44 ± 5.88 and 42.92 ± 3.53 MPa, respectively, with 15 g giving maximum strength and toughness. Excess fibre dosage decreased workability and compressive strength. Both reinforcement geometry and quantity significantly influenced performance, with optimized double/triple meshes and ~15 g fibre offering the best strength–toughness balance for practical applications.

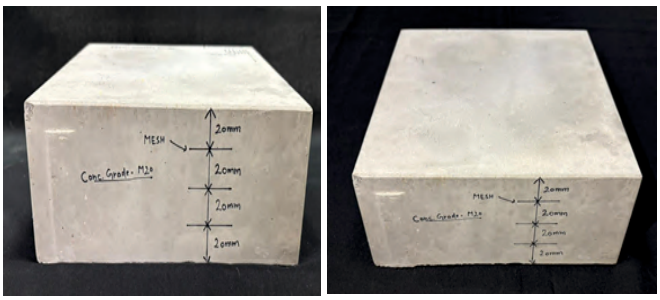


Fig. 3. Jute reinforced concrete bricks

Solar-Powered Universal Insect Trap (Day/Night)

A solar-powered universal insect trap was developed as a physical alternative to chemical pest control for field crops and stored commodities. The system incorporates a solar panel, battery box, blue and yellow sticky traps, light source, water basins, pheromone dispensers, and a height-adjustable stand (2–8 ft), integrated with a light sensor circuit for automatic day/night operation. Once charged, it operates autonomously for 8–12 h at night, covering peak nocturnal pest activity, and requires no operator intervention due to automated switching. The trap is lightweight, portable, modular and can be assembled by a single person without specialized tools, suitable for both indoor and outdoor use. It has proven effective in paddy, brinjal, cabbage, chilli, mustard, guava, wheat, onion and green peas, as well as in stored grain ecosystems. The novelty lies in compatible integration of multiple attractants and trapping methods, enabling broad-spectrum pest management across diverse crops and storage conditions.

Fig. 4. Solar universal insect trap

Microcontroller-Based Maize Cob Dryer with Humidity-Responsive Airflow Control

To overcome slow and weather-dependent open-sun drying of maize cobs during post-monsoon Kharif, a lightweight, portable GFRP (Glass Fibre Reinforced Plastic) maize cob dryer (1-tonne capacity) was developed. The dryer features a perforated GFRP drying bed on a foldable frame, a transparent polyethylene roof for greenhouse heat gain and an Arduino-based humidity-responsive fan system that automatically regulates airflow. Field trials (October 2025) reduced cob moisture from 36.3% to ~17% (w.b.) in 8–9 days versus 10–15 days in open sun. Internal temperature remained 4–6 °C above ambient and relative humidity 8–10% lower, ensuring faster, safer drying with no fungal growth. Energy consumption was low due to fan operation only when needed, reducing fan runtime by ~40% and minimizing electricity use. Structural analysis confirmed that the GFRP bed safely supported one tonne without sagging, indicating robustness and long-term applicability. The system improves grain quality, protects against rain and dust, minimizes rewetting and losses, and is suited to small and medium-scale farm operations, with future integration planned with solar PV for off-grid use.

Fig. 5. Field evaluation of the Microcontroller-based maize cob dryer showing the outer structure and transparent roof for solar heat gain.

Fig. 6. GFRP perforated drying bed in unfolded and folded configurations for drying operation and easy portability

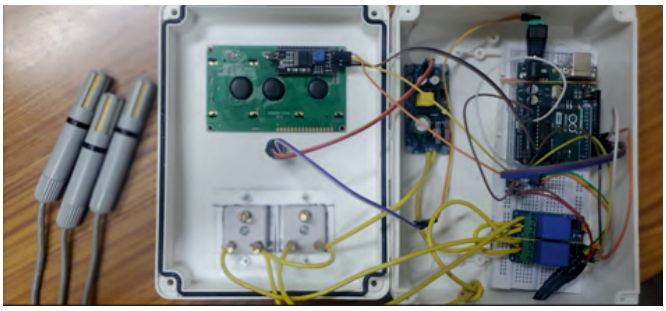


Fig. 7. Microcontroller-based humidity control system with sensors and control circuitry for automatic airflow regulation.

Waterless Live Fish Transportation

A waterless live fish transport system was developed for Rohu (Labeo rohita) using controlled hypothermia, anaesthetic sedation and optimized atmospheric conditions. Fish (20–35 cm, 250–600 g; n=10) were anaesthetised using clove oil (1 mL/15 L), benzocaine (50 mg/L) or gradient cooled water, and anaesthesia (Stage II) and recovery times were compared. Anaesthetizing time was lowest with clove oil (02:55–03:30 min:s), followed by benzocaine (03:33–20:00) and gradient cooled water (29:00–35:00), while recovery time was shortest with benzocaine (1:24–2:58), then clove oil (05:10–06:15) and gradient cooled water (07:00–14:00). Anaesthetised fish, packed without water in food-grade LDPE with surplus oxygen, survived waterless for 277 ± 27 min (~4 h 37 min) with 80% survival. Results indicate feasibility of waterless transport of Rohu for about 5 hours, with potential extension by maintaining high humidity, moist pads and minimal gill movement.

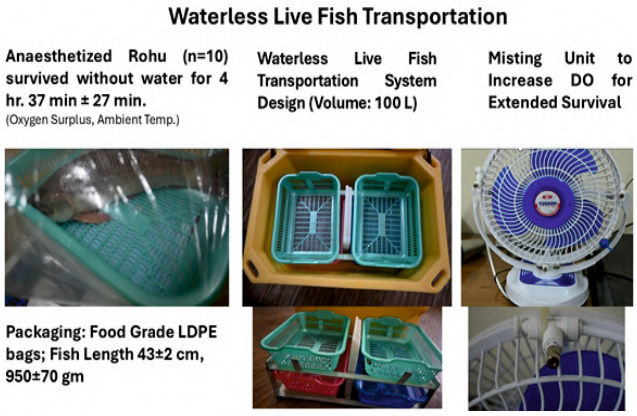


Fig. 8. Waterless live fish transport system

Portable Cool Crate for Horticultural Crops

A thermoelectric cool crate was developed and evaluated for extending tomato shelf life. About 5–6 kg of freshly harvested, sorted tomatoes were stored under ambient (control) and thermoelectric-cooled conditions. The crate, powered by an SMPS, maintained continuous operation throughout storage. Under ambient conditions, rapid transpiration and respiration caused higher physiological loss in weight (PLW), shrivelling and loss of marketable quality. In thermoelectric storage, controlled low temperature and relative humidity reduced vapour pressure deficit, significantly minimizing moisture loss and PLW. TSS ranged from 3.5 to 3.93 °Brix, with ambient storage showing faster metabolic decline of acids and firmness due to high respiration and cell wall-degrading enzymes, whereas cooled storage slowed acid degradation and firmness loss. Bioactive compounds (lycopene, vitamin C, phenolics and antioxidant activity) degraded rapidly at ambient conditions due to oxidation and enzyme activity, while thermoelectric storage at ~10–15 °C substantially preserved these components, limited microbial growth and maintained textural and visual quality. Overall, Peltier-based cool crates effectively prolonged tomato shelf life and quality compared to ambient storage.

Fig. 9. Effect of storage on physico-chemical and bioactive properties of tomatoes

Automated Dual-Imaging and Deep Learning-Based System for Real-Time Non-Destructive Grain Quality Assessment

The assessment of grain quality plays a pivotal role in agricultural trade, pricing, and food supply chain transparency; however, conventional manual inspection methods are inherently subjective, labour-intensive, time-consuming, and inadequate for handling the demands of large-scale grain procurement and monitoring. To address these limitations, this study presents a comprehensive, automated, real-time, and non-destructive system for the quality assessment of major cereal grains, including rice, paddy, and wheat. The proposed system integrates a dual-scanner imaging setup designed to mitigate practical challenges, including grain translucency, overlapping kernels, and background dependence, thereby ensuring consistent image acquisition. Advanced image processing techniques, including watershed-based segmentation and corner detection algorithms, are employed to achieve precise and reliable grain separation in the image. For classification of refractions, a fine-tuned, customised deep learning model is utilised to accurately detect physical refractions such as broken, damaged, discoloured, chalky grains, and foreign matter in accordance with established procurement standards. Experimental evaluation demonstrates a high segmentation accuracy of approximately 98.4% for 20-g grain samples, while classification results achieve overall accuracies of 96% for raw rice and wheat, and 92% for paddy. Additionally, the system shows consistent performance across multiple test batches, highlighting its stability and repeatability. These results validate the effectiveness, robustness, and scalability of the proposed system, highlighting its potential as an objective and efficient alternative to manual inspection methods, with strong applicability in commercial operations and regulatory frameworks to enhance reliability and transparency in grain quality evaluation.

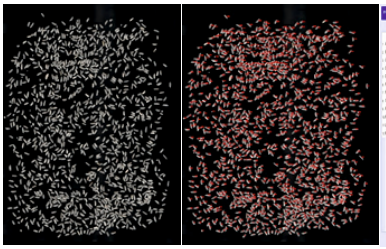


Fig. 10. Image of rice taken with scanner

Fig. 11. Segmentation of complex touching grains

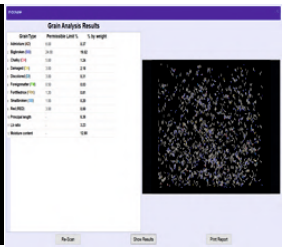


Fig. 12. Deep learning model-based output image with results

Attention-Augmented Bi-LSTM Model for Core Temperature Prediction in Apples: Toward a Digital Twin Framework for Intelligent Cold Storage

This work focuses on developing a real-time digital twin framework for monitoring apple quality during storage using sensor networks and machine learning. The experimental setup involved 60 kg of Red Delicious apples stored in a cold room at controlled temperature and humidity. Apples were distributed in three crates of 20 kg each. Ten temperature-humidity (TH) sensors were installed inside the cold room to continuously record ambient conditions. Each crate was instrumented with three probe-type temperature sensors (T1, T2, T3) for monitoring core temperature at different levels and three non-contact IR sensors (IR1, IR2, IR3) to measure apple surface temperature and localized ambient temperature. This resulted in a dataset of over 20,000 data points collected over a seven-month storage period. Data preprocessing included cleaning, outlier detection, visualization, and normalization to ensure robust model training. The study primarily focused on predicting the core temperature (T2) using a Bidirectional Long Short-Term Memory (BiLSTM) network with an attention mechanism. Two experiments were conducted: (A) prediction of T2 using temperature and humidity inputs, and (B) prediction using only temperature inputs. The dataset was split into training (80%) and testing (20%) subsets without data leakage. The models were trained using the Adam optimizer with a learning rate of 0.001, batch size of 100, 50 epochs, and a dropout rate of 0.1 to prevent overfitting. Model performance was evaluated using Mean Squared Error (MSE) and Mean Absolute Error (MAE). For Experiment A, the model achieved an MSE of 1.343983 (training) and

1.201171 (validation), with corresponding MAE values of 0.797578 and 0.730524. Visualisation included actual vs. predicted T2 plots, training and validation loss curves, scatter plots, residual error analysis, and time-series overlays. These results confirm that including humidity slightly improves prediction accuracy and supports the development of a robust digital twin for real-time shelf-life prediction of apples.

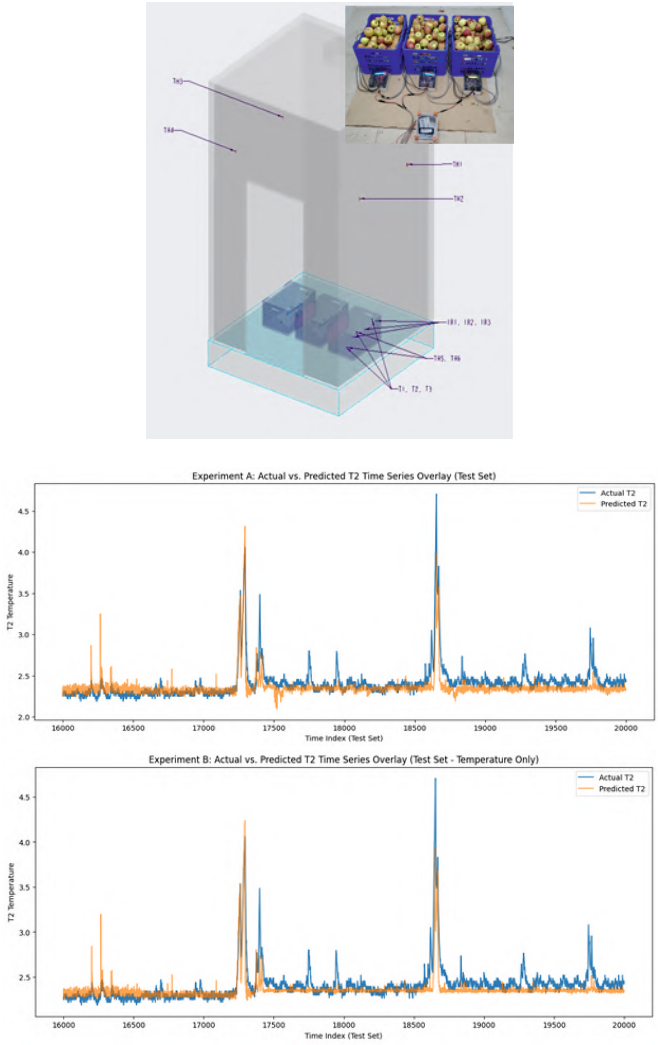
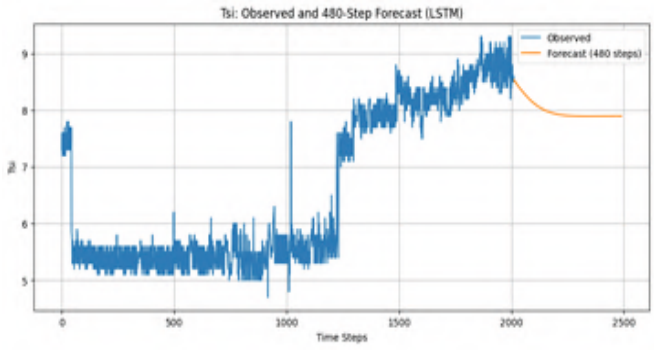


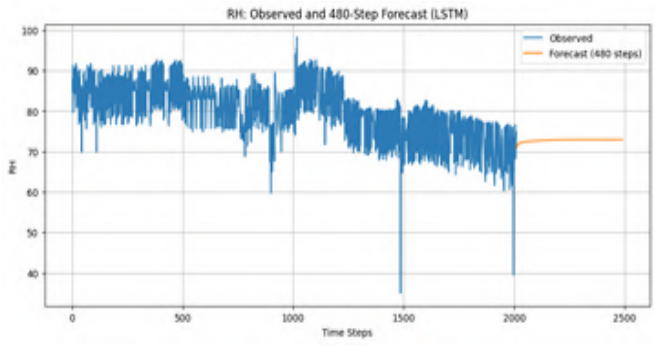
Fig. 13. Red delicious variety apples in crates and positions of various sensors in the room and crates

AI-Based Prediction Models for Microclimate Parameters Using an IoT-Based Monitoring and Control System in Cold Storage

An IoT-enabled monitoring and AI-based prediction system was developed to manage microclimate conditions in onion cold storage with internal dimensions of 3.05 × 3.05 × 2.44 m over a three-month period. Sensors for temperature, relative humidity, oxygen (O_2), and carbon dioxide (CO_2) were strategically installed to capture spatial variations, recording data at 15-minute intervals to create a detailed time-series dataset. Three predictive models were implemented: Multivariate Linear Regression (LR) as a baseline, Support Vector Machine (SVM) with a radial basis function kernel for nonlinear modeling, and Long Short-Term Memory (LSTM) to capture temporal dependencies. Model performance was evaluated using RMSE, MAE, coefficient of determination (R^2), and correlation coefficient (R), along with recursive forecasting up to 480 time steps (about five days).Results showed that all models captured general trends, but performance varied significantly. LR offered simplicity and interpretability but struggled with nonlinear dynamics, especially gas concentration changes. SVM improved prediction accuracy by modeling nonlinear relationships, showing moderate gains. LSTM consistently outperformed both, achieving higher correlation (R > 0.75) and lower error values due to its strength in learning temporal patterns and delayed interactions among variables. It also demonstrated stable long-term forecasting capability.Overall, integrating IoT monitoring with AI models enabled early detection of microclimate deviations and supported proactive control strategies, improving environmental regulation, reducing post-harvest losses, and enhancing decision-making in cold storage management of perishable commodities.

Prediction by LSTM





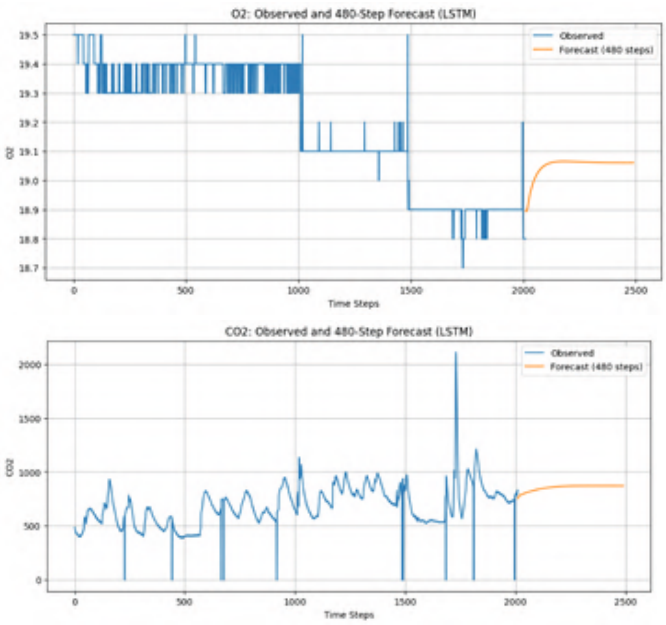


Fig. 14. Prediction by LSTM

Sensor-Based System for Environmental Monitoring of Banana

The banana supply chain sensor monitoring system was upgraded from a prototype to a compact, product-ready, multi-node system. A microcontroller with built-in wireless connectivity replaced earlier boards, and the display was changed from LCD to energy-efficient E-ink. The architecture now includes a Master node and multiple coordinated sub-units for distributed monitoring. Circuitry was migrated to a custom PCB, reducing footprint to about one-tenth of the original and eliminating bulky wiring. Real-time battery monitoring and increased power capacity support long-duration operation. The system is capable of recording real-time environmental data during cold storage and transport, facilitating data-driven control strategies.

Fig. 15. Sensor-based banana monitoring device; real-time cold storage data

Blockchain-Based Software for Banana Traceability and Supply Chain Management

A blockchain-ready digital platform was developed to integrate banana supply chain stakeholders including farmers, traders, transporters, warehouse operators and administrators. The architecture emphasizes scalability, data integrity and secure operations, with planned integration of Hyperledger Fabric to ensure transparency and immutability. A role-based website and UI were designed to provide clear navigation and information flow, with core static pages and functional modules implemented for defined workflows, access control and efficient processing across user panels. This unified platform forms the basis for traceability, quality assurance and market transparency in banana value chains.

Fig. 16. Blockchain-based website home page

3D Food Printing for Designer Foods

3D food printing was explored using nutrient-dense spinach-based inks to enable personalized, visually appealing foods. Spinach powder particle size (338.18–70.98 µm) significantly influenced functional properties and printability of the formulated inks. As particle size decreased, water absorption index and oil absorption capacity declined, altering rheological behaviour. In printability trials, smaller particle sizes (100–220 µm) yielded smoother surfaces and higher resolution with minimal edge deformities and cracks, while inks with larger particles (~250 µm) showed edge deformation and visible cracks. Additional trials with barnyard millet-based ink successfully printed complex geometries, demonstrating versatility of the 3D printing system for multi-ingredient, functional foods.

Fig. 17. 3D-printed spinach shape

Processes, Protocols and Products

ELISA-Based Process for Detection of Aflatoxin B1 in Maize

A rapid colorimetric ELISA process was standardized for Aflatoxin B1 (AFB1) detection in maize. The protocol involves antibody coating of microplates, blocking of non-specific sites, incubation with AFB1 antigen and enzyme-linked secondary antibody, followed by substrate addition and colour development. Absorbance is measured at 427 nm, enabling quantification of AFB1 down to 0.624 µg/kg in spiked maize flour. This approach offers a sensitive, faster and less instrument-intensive alternative to conventional HPLC and TLC for routine maize safety monitoring.

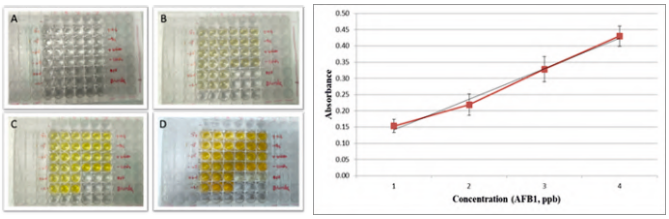


Fig. 18. AFB1 analysis of spiked maize flour by ELISA

Low-Fat, Low-Sugar Sorghum-Based Cookies

A process technology for healthier sorghum cookies was developed using Response Surface Methodology. Low-fat, gluten-free formulations with xanthan gum, guar gum and HPMC were optimized, achieving up to 30% fat reduction with acceptable sensory attributes and minimal spread ratio variation (4.25–5.10). Building on this, sugar was partially replaced (20–100%) with non-nutritive sweeteners (aspartame, saccharin, sucralose) and sugar alcohols (mannitol, sorbitol, xylitol). A 30% sugar replacement was found optimal. Dough texture analysis showed highest resistance in control dough (9.97 g), followed by sorbitol-based (7.80 g) and lowest for aspartame-based (6.45 g), paralleling cookie hardness (22.36–41.56 N vs. 42.78 N for control). Water activity increased from 0.079 (control) to 0.173–0.253 in sugar-reduced cookies, with xylitol having the highest values. Overall acceptability remained high (6.45–7.80 vs. 8.05 control), with sucralose-based cookies scoring best among sweeteners and aspartame the lowest. The optimized sorghum cookies (30% reduced fat and sugar, HPMC and sucralose) provide a promising, healthier alternative for gluten-intolerant and health-conscious consumers.

Vacuum Frying Protocol for Beetroot Chips

A vacuum frying process for beetroot chips was standardized using uniform slices (2.20 mm) subjected to washing, draining, spinning and pre-freezing at −25 °C for 1 hour. Samples were fried at 90 °C under 7.99 kPa vacuum for 25 minutes, followed by de-oiling in a vegetable spinner, cooling in low humidity and nitrogen-flushed laminate packaging. Vacuum-fried beetroot chips showed superior colour, texture, reduced oil uptake, higher betalain retention and better sensory acceptability compared to conventionally fried chips.

Fig. 19. Vacuum-fried beetroot chips

Processing of Forest Produce of Chhattisgarh – Honey Quality Testing

Honey samples from multiple locations in Chhattisgarh were analysed for moisture, pH, TSS (°Brix), titratable acidity, reducing sugars, sucrose and Fiehe test. Moisture content ranged from 15.984 ± 0.261% (Taregaon) to 17.557 ± 0.165% (Gariyaband), pH from 4.29 ± 0.01 (Gariyaband) to 5.946 ± 0.015 (Taregaon) and TSS from 78.2 (Van Mandal) to 79.8 (Sidhari). Titratable acidity varied between 0.105 ± 0.002 and 0.193 ± 0.006 as formic acid. Reducing sugar content was highest in Sadaspur (74.47 ± 1.217%) and lowest in Van

Mandal (60.763 ± 0.834%). Sucrose ranged from 3.253 ± 0.047% (Taregaon) to 5.346 ± 0.144% (Van Mandal). All samples tested negative in Fiehe test, confirming absence of adulteration. Overall, all honey samples complied with FSSAI standards except Van Mandal, which had titratable acidity slightly below the permissible limit.

Table 1.2 Quality parameters of honey received from CGMFPFed.

Honey samples	Moisture content (%)	pH	TSS (°Brix)	Titrable acidity	Reducing sugar (%)	Sucrose (%)	Fiehe test
Sidhari	16.24±0.06	5.93±0.02	79.80	0.15±0.01	62.72±1.14	4.43±0.11	Negative
Taregaon	15.98±0.26	5.94±0.01	79.60	0.105±0.01	68.82±0.69	3.25±0.04	Negative
Gariyaband	17.55±0.16	4.29±0.01	79.40	0.193±0.01	64.58±1.19	4.22±0.24	Negative
Sadaspur	16.84± 0.49	5.73±0.02	79.20	0.13±0.01	74.47±1.21	5.03±0.04	Negative
Van mandal	16.71±0.30	5.15±0.01	79.60	0.17±0.01	60.76±0.83	5.34± 0.14	Negative
As per FSSAI guidelines: Moisture content<20%; pH - 3.9 to 6.10; TSS>65; Titrable acidity<0.4; Processed honey Reducing sugars>65%; Raw honey Reducing sugars>60%; Sucrose content - 5 to 10%; Fiehe test - negative							

Tikhur-Based Bael Drink

A Tikhur (East Indian arrowroot)–Bael juice drink was developed to improve solubility, stability and sensory quality while preserving its traditional cooling and digestive benefits. Poor starch solubility in conventional Tikhur drinks led to sedimentation and layering, prompting enzymatic modification. Tikhur powder (1 g) was mixed with 80 mL water and heated to 60 °C, followed by cooling and addition of α-amylase for partial starch hydrolysis (20 min shaking). After enzyme deactivation by reheating, 120 mL Bael juice was added and the mixture heated to 82 °C to attain desired texture and flavour. The improved drink showed better solubility, stability and overall sensory acceptability with enhanced nutritional profile.

Fig. 20. Tikhur–Bael drink preparation and final product

Roasted Brown Rice–Infused Green Tea (Genmaicha-Type)

A process was developed for Indian-style Genmaicha using locally available green tea and brown rice (Sona Masuri variety). Brown rice was dry-pan roasted at 140–200 °C for 1–4 minutes and optimized using CRD; roasting at ~175 °C for 3–4 minutes produced desired flavour, colour and texture while preserving nutrients. Roasted brown rice and green tea were blended in varying ratios (1:1, 1.2:1, 1.5:1; 2 g per tea bag). Physico-chemical parameters such as moisture, texture, colour, flavour profiles, fat, tannins, caffeine, antioxidant activity, pH, acidity, reducing sugars, phenolics, solids and ash were analysed. Optimized combinations resulted in a sensorially acceptable, nutritionally enriched roasted brown rice green tea, offering a domestically produced alternative to imported Genmaicha.

a) Brown rice (Sonamasuri variety)

b) Dry pan roasting of brown rice

c) Roasted brown rice

d) Green tea

e) Mixture of roasted brown rice and green tea

f) Prepared roasted brown rice green tea bags

Fig. 21. (a-f) Process for Preparation of Roasted Brown Rice-Infused Green Tea

Novel Botanical Fumigant Formulations and Delivery Mechanisms

Preliminary fumigation bioassays in 10 mL tubes (10 adults per treatment) were conducted on *Rhyzopertha dominica*, *Tribolium castaneum* and *Trogoderma granarium* using a newly formulated botanical insecticidal blend. At higher test doses (1000–100 µL), 100% adult mortality occurred within 30 minutes for all species. Complete mortality was also observed at 90–10 µL, indicating strong fumigant action and rapid knockdown irrespective of species and tested concentrations. The effective lethal dose is expected to be below 10 µL under these conditions. Future detailed bioassays with lower doses, higher replication and probit analysis will determine LD_{50} and LD_{99} values and support formulation scaling for safe grain fumigation.

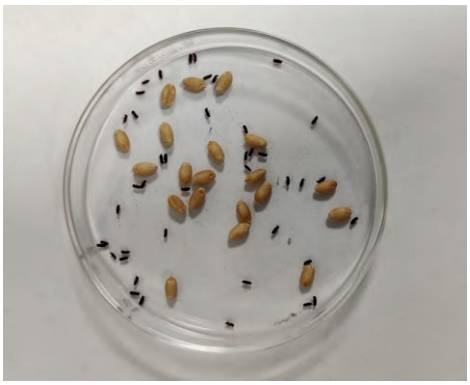


Fig. 22. Complete mortality of R. dominica

Screening and Genetic Modification of Yeast (Saccharomyces cerevisiae) for Enhanced Xylitol Production

Yeast strains were screened for xylose tolerance and xylitol production, targeting safer, yeast-based biotransformation as an alternative to chemical routes or non-GRAS microbes. Plate assays on minimal medium (xylose 40–140 g/L) identified MTCC 171 as the most efficient strain, growing up to 140 g/L xylose, with MTCC 3821, MTCC 13018 and GP10 growing up to 120 g/L. An HPLC method (Agilent Hi-Plex column) was standardized for glucose, xylose and xylitol quantification, validated using standards and spiked samples. Xylitol purification from fermentation broth was achieved by filtration, activated charcoal treatment (20 g/L), vacuum concentration, seeding with commercial xylitol (1.0 g/L) and crystallization at −20 °C, followed by drying and purity assessment by HPLC.

Retrieval and In Silico Analysis of XYL2 Gene

The XYL2 gene (xylitol dehydrogenase; YLR070C) from S. cerevisiae S288C (1071 bp, chromosome XII) was retrieved from SGD and UniProt for genome editing. Gene-specific primers were designed using PerlPrimer and Primer3; genomic DNA from multiple strains was isolated (CTAB method) and assessed for PCR suitability. PCR amplified 1021 bp and 1213 bp regions of XYL2 from MTCC 171 and MTCC 13018, respectively, which were Sanger sequenced. Sequence comparison with reference XYL2 revealed variations relevant for editing design. Using CRISPOR, four high-efficiency, low off-target sgRNAs (sgRNA1–4) were selected for CRISPR–Cas9 targeting and will be cloned into pML104 for functional validation.

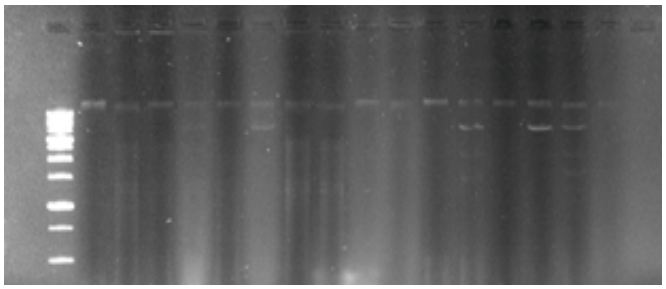


Fig. 23. DNA isolated from yeast strains; PCR amplification profiles

Extraction of Bioactive Compounds from Ajwain Seed Powder

A conventional water bath-assisted extraction protocol was optimized to maximize bioactive recovery from ajwain seeds. Solvents (water, ethanol, methanol, acetone, diethyl ether), solute-to-solvent ratios (1:5–1:20), times (3–7 h) and temperatures (30–80 °C) were systematically evaluated with uniform agitation and minimal solvent loss. Methanol consistently showed superior extraction performance. Highest phenolic recovery occurred at 55 °C, 5 h and 1:15 ratio, while

higher temperatures or excessive dilution did not improve yield and caused phenolic degradation or reduced recovery. Methanol under moderate conditions was thus identified as the most promising solvent system for ajwain bioactive extraction. The activity was done under a project sponsored by DBT.

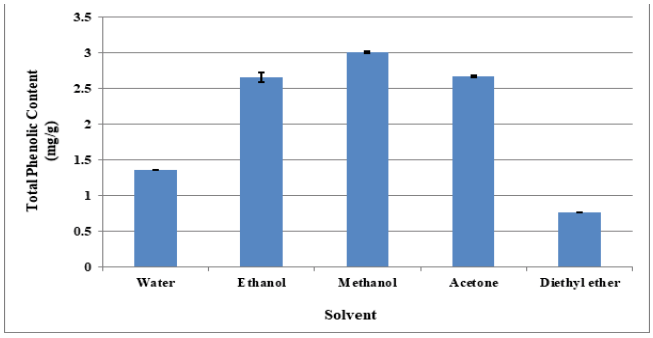


Fig. 24. Total Phenolic Content of Extracts Obtained using Different Solvents

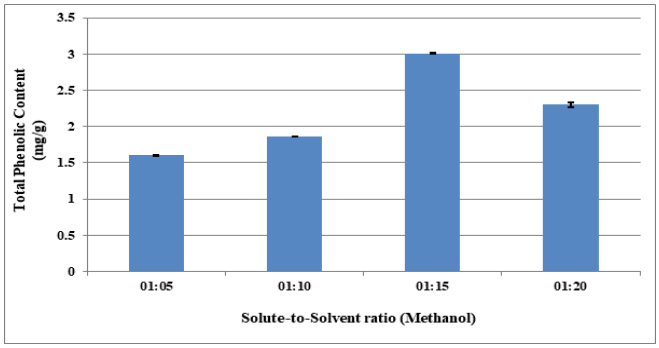


Fig. 25. Effect of Solute-to-Solvent Ratio on Total Phenolic Content of Methanolic Extracts

Process and Model for Peri-Urban Dairy Structure

A process protocol and model for a multi-storey peri-urban dairy structure was developed to address land scarcity, waste management, animal comfort and energy efficiency under the *Viksit Bharat* vision. The design emphasizes hygienic milk production, ergonomic operations, automated feeding, sensor-based environmental and animal monitoring, and advanced ventilation. Integrated biogas and solar energy systems support on-farm energy needs. CFD simulations (ANSYS) determined optimal air velocities of 3.0–4.5 m/s in summer (45 °C), 0.8–1.5 m/s in spring (30 °C) and 0–0.3 m/s in winter (10 °C), ensuring thermal comfort across seasons. The model provides a futuristic, resource-efficient dairy solution aligned with national sustainability goals.

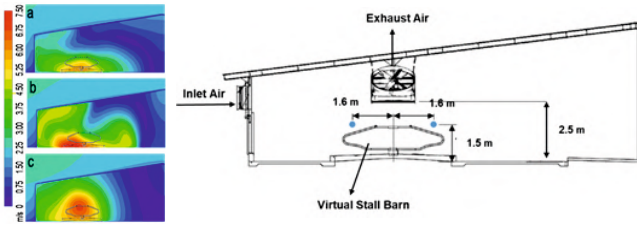


Fig. 26. Conceptual model and CFD airflow simulation of peri-urban dairy structure

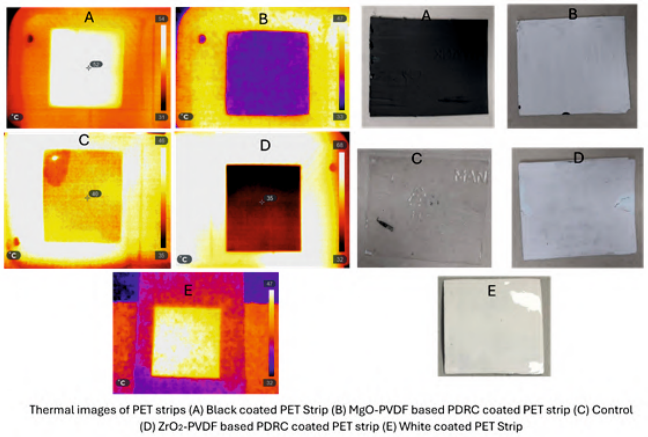
TiO_2 Nanoparticle–Enhanced Glauber's Salt-Based Eutectic PCMs for Cold Chain

Glauber's salt (sodium sulphate decahydrate) was engineered as a low-cost phase change material (PCM) for cold-chain energy storage. Hydration of anhydrous sodium sulphate, coupled with 10% (w/w) salt mixture (KCl:NH_4Cl at 1:1.8), reduced phase-transition temperature from ~32 °C to <10 °C. Dispersion of 1.0% TiO_2 nanoparticles via ultrasonication and gelation with polyacrylate produced a stable gel PCM with negligible phase separation and supercooling. TiO_2 acted as nucleating and thermal conductivity enhancer, yielding latent heat of 150–180 J g^{-1} and up to 22% higher thermal conductivity. Charging time was reduced by 31%, supporting faster energy capture and shorter compressor run times. The developed PCM shows strong potential as an economical, efficient thermal storage medium to strengthen cold-chain resilience against power interruptions.

MgO/ZrO_2 Nanoparticle-Based Passive Daytime Radiative Cooling (PDRC) Coatings

PDRC coatings using MgO and ZrO_2 nanoparticles in PVDF and cellulose acetate matrices were optimised for high solar reflectance and thermal emissivity. A 3:1 NP-to-polymer ratio yielded the best balance, achieving emissivity of ~0.92–0.96 in the 8–14 µm LWIR window. ZrO_2–PVDF coatings achieved solar reflectance of 0.96 (absorbance 0.02, transmittance 0.02), while MgO–PVDF showed 0.94 reflectance. Outdoor tests on 7 × 7 cm PET and metal strips demonstrated substantial sub-ambient cooling: MgO–PVDF-coated strips reached 28.7 °C vs. 38.2 °C ambient and up to 52.9 °C for black controls. Average ΔT for MgO–CA and ZrO_2–CA was 7.70–7.92 °C below uncoated and ~20 °C below black controls, outperforming commercial white paint by 5.0–5.9 °C. Application on PET boxes reduced internal temperature by 8–11 °C (mean 8.58 °C) under peak sunlight, confirming coating durability and scalability as an

electricity-free cooling solution for packaging, post-harvest handling and short-term storage.



Thermal images of PET strips (A) Black coated PET Strip (B) MgO-PVDF based PDRC coated PET strip (C) Control (D) ZrO_2-PVDF based PDRC coated PET strip (E) White coated PET Strip

Fig. 27. Thermal images and heatmaps of coated strips and PET boxes

Modified Atmosphere Packaging Protocol for Extending Shelf Life of Desi Gulab (Rosa damascena)

A MAP-based protocol was developed to extend post-harvest shelf life of Desi Gulab from 2–3 days to up to 21 days. Flowers were packed in LDPE, PP and PET films with an unpacked control. Respiration rate, film permeability, gas composition (O_2, CO_2, N_2), weight loss, colour (L*, a*, b*), texture (peak force, stiffness) and fuzzy-logic-based sensory scores were monitored. The control lost >60% weight by Day 10, with severe colour and texture degradation. PP packaging minimized weight loss (~7 g from 10–11 g by Day 10) and maintained highest brightness (L* 55.17 Day 1) and elasticity (peak force up to 115 g, stiffness 18 g s^{-1}). PET maintained gas composition close to target (O_2 ~1.8%, CO_2 ~9.08% by Day 21) and high colour retention (L* 47.5 at Day 21), with strong correlation (0.91) to fuzzy sensory scores (6–8 range). LDPE gave intermediate results. Overall, PP offered the best textural preservation, while PET provided the most consistent overall quality, validating MAP as a viable strategy to reduce post-harvest losses and enhance marketing window.

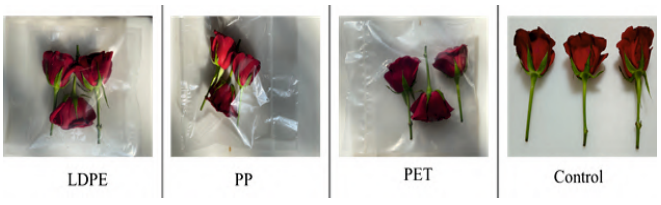


Fig. 28. Desi Gulab under different packaging materials; sensory correlation and fuzzy scores

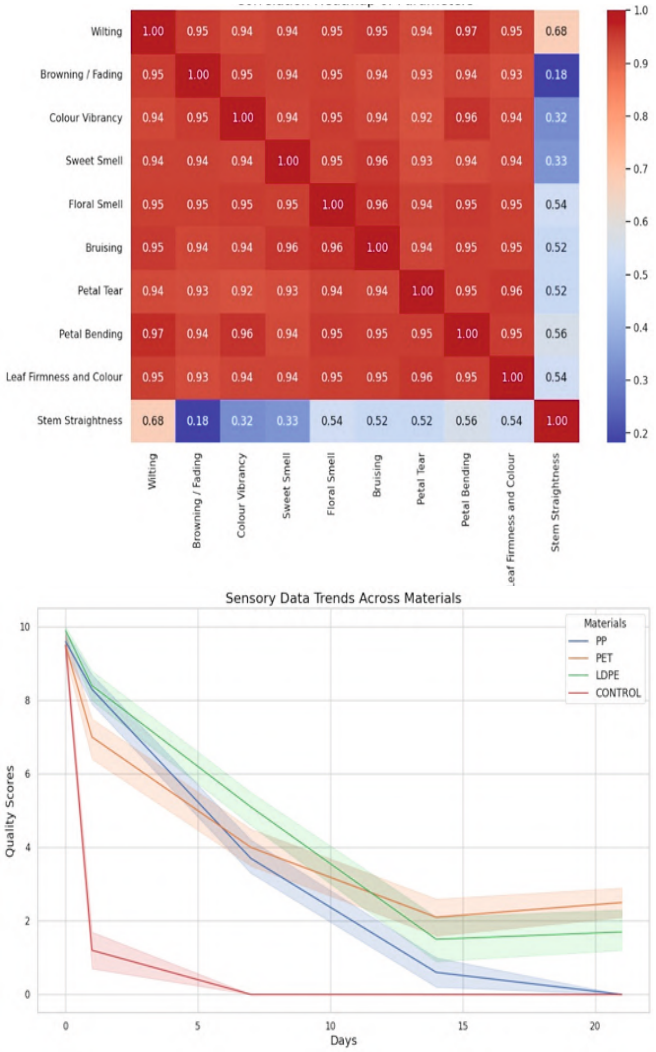


Fig. 29. Fuzzy scores obtained for different packaging materials over the storage period

Quality evaluation of Hawaijar Packed in Different Packaging Materials

Hawaijar, a traditional fermented soybean product, was stored in PP, PET and EVOH pouches under ambient (22 ± 1 °C, 60–80% RH) and refrigerated (4 ± 1 °C, 45–50% RH) conditions. Quality parameters (total bacterial count, ammonia, hardness, colour, protein digestibility, sensory scores) were monitored at 2-day (ambient) and 5-day (refrigerated) intervals. Under ambient conditions, PP (497.4 µm) extended shelf life to 4 days, PET and EVOH (non-vacuum) to 2 days, while EVOH with vacuum showed pack damage within 2 days. Under refrigeration, shelf life extended to 15 days (PP), 10 days (PET) and 5 days (EVOH non-vacuum). EVOH vacuum packs developed off-odour by Day 5. PP under refrigeration emerged as the most suitable packaging–storage combination for Hawaijar.

X-ray Imaging for Aril Browning/ Blackening in Pomegranate and Mass Estimation Model

X-ray imaging parameters (52–70 kV, 1000–3000 mA) were optimised for detection of aril browning and black heart disease in pomegranate. Distinct internal patterns were obtained for healthy, browned and blackened arils, demonstrating feasibility for rapid internal quality assessment. In parallel, non-destructive mass estimation models for 'Bhagwa', 'Super Bhagwa' and 'Ganesh-137' were developed using geometric parameters and advanced algorithms (ANN, SVR) compared with traditional regression. ANN with Levenberg - Marquardt training gave highest performance, achieving R^2 = 0.94 for 'Super Bhagwa' and ~0.89 accuracy for 'Ganesh'. These models can significantly reduce manual grading and packing costs while improving uniformity and market value.

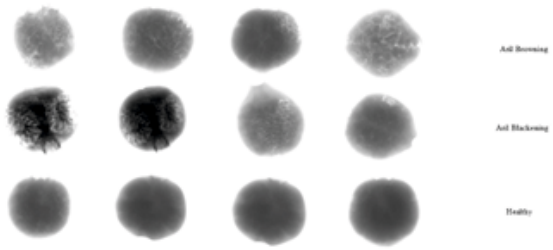


Fig. 30. X-ray images and dimensions of pomegranate; model performance plots

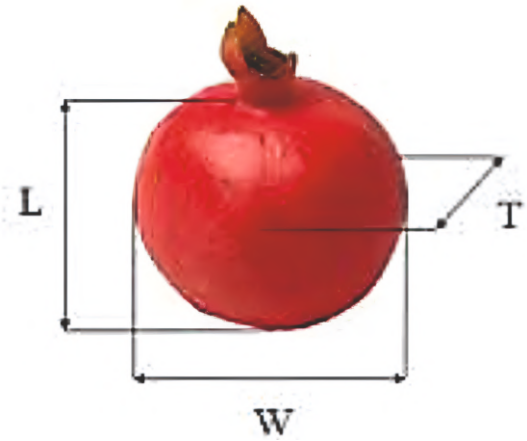


Fig. 31. Dimensions of pomegranate, three linear dimensions

Biospeckle Imaging for Chilling Injury in Peach

A comprehensive laser biospeckle imaging protocol was standardized for monitoring chilling injury in peaches during cold storage. The system includes 632, 532 and 405 nm laser sources (5–10 W), 20× beam expander, scientific CMOS camera with zoom lens, mirrors, polarizers and bandpass filters in backscattering geometry. Samples are mounted on a temperature-controlled X–Y stage with ±10 µm precision. Imaging parameters (speckle size 2–3 pixels, 50–70% well capacity, ≥25 fps) were optimized, and strict quality control (laser drift <2%, CV <5% on static phantoms, correlation >0.85 with reference methods) was enforced under Class 3B/4 laser safety. Sequential imaging at 0, 7, 14, 21 and 28 days (0 °C, 95% RH) allowed quantification of biospeckle activity indices (spatial/temporal contrast, inertia moment), which decrease with membrane dysfunction and tissue browning.

A large biospeckle dataset was created for two Himachal peach varieties ('Alexander', 'Para Deluxe') comprising 52.11 GB and 16.92 GB respectively, with 2464 × 2056 resolution RAW images at multiple wavelengths and power levels, alongside text metadata. The dataset is suitable for research in image processing, defect detection, computer vision and AI/deep learning.

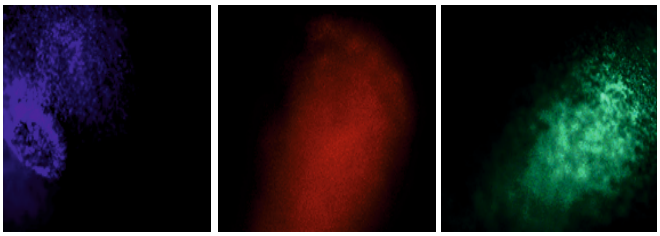


Fig. 32. Biospeckle signatures at 405, 650 and 532 nm

Study on Tomato Value Chain for Minimizing Post-Production Losses

A comprehensive study on the tomato value chain in India quantified post-harvest losses (15–25%) and identified key systemic gaps. Primary data were collected from farmers, traders, retailers, processors, seed suppliers and experts, supplemented by secondary literature and policy documents. Key findings included: 2–3% rapid losses in pre-marketing stages due to inadequate mandi space and poor sorting/grading; limited access to quality seeds and planting material; reliance on multiple uncoordinated varieties; peak-season overproduction (February–May) causing severe price crashes (<₹3/kg), labour shortages and absence of MSP/contract farming; 15–30% glut-period losses due to poor storage, cold chain and limited processing capacity; lack of price premium for organic growers due to inadequate GAP certification; and constrained hybrid seed

R&D due to high costs and low private participation. Recommendations include varietal replacement with high-yielding, processing-suitable hybrids (e.g. Arka Apeksha, Arka Vishesh), stronger IPR, mechanized harvesting, MSP, expansion of processing and cold-chain infrastructure, greater FPO and cooperative engagement, greener processing technologies, and adoption of digital platforms (e-NAM, traceability, IoT) for improved efficiency, reduced losses and better farmer price realization.

Functional Coatings for Minimally Processed Fruits and Vegetables

Stabilization of Aloe Vera Gel

Aloe vera gel extracted under sterile conditions was stabilized with different additives to maintain pH near 4.5 and stored at 30 °C and 5 °C. Untreated and treated gels initially had pH 5.83 and 4.64, which increased to 7.16 and 6.24 under ambient storage, causing rapid colour deterioration. L-cysteine (0.20%) effectively preserved gel colour and antioxidant activity (35% DPPH inhibition after 30 days at 5 °C), outperforming citric acid and calcium chloride treatments. Citric acid showed higher microbial growth; $CaCl_2$ delayed spoilage but did not prevent browning beyond 15 days. Overall, 0.20% L-cysteine provided the best quality retention for 30 days in cold storage.

Improving Coating Efficacy on Cut Fruit Surfaces

To enhance adhesion and stability of aloe gel coatings on cut fruits, pectin, gum acacia and xanthan gum were evaluated as fillers. Coating thickness (0.023–0.078 mm) remained within commercial limits (≤0.25 mm). Xanthan gum best retained colour, texture and viscosity after three days, while gum acacia was least effective. Moderate xanthan (0.3%) improved viscosity and stability; 1% pectin enhanced gloss, viscosity and coating efficiency, achieving strong adhesion and clear films. Xanthan was preferred for stability and germicidal effect, whereas pectin was suitable when transparent coatings were desired.

Functional Coatings for Minimally Processed Vegetables

Functional edible coatings comprising 75% aloe vera gel or 30% cactus gel, with 1% pectin, 0.20% L-cysteine and 0.5% glycerol, were applied to cucumber and carrot discs (0.5–1.0 cm). Coated slices were drained, packed in PET boxes and stored at 5 °C. Aloe-coated cucumbers showed non-detectable pathogens, lower mould and yeast counts (<2.7 log CFU/g), reduced softening and remained acceptable up to 6 days (sensory score 6.2) versus 3 days for control (score 2.4). Carrot discs coated with aloe or cactus gels were commercially acceptable for 18 days without lignification or fungal growth (score 7.3), while controls lignified by Day 6 and had high microbial loads by Day 9. Overall, 75% aloe vera gel-based coatings significantly extended shelf life and quality of minimally processed vegetables under home and retail conditions.

Fig. 33. Storage quality of minimally processed vegetables with and without coatings

Metabolite Profiling and Sprouting Inhibition in Onion

Ethylene Treatment under Ambient Storage

Metabolite redistribution and enzyme activities were evaluated in different onion bulb layers (outer scale, inner scale, base plate, top plate) during prolonged ambient storage, with and without ethylene treatment. In untreated bulbs, sucrose, fructose and glucose levels increased in the base plate over time, supporting sprout initiation, while outer scales initially had higher sugar content. Ethylene-treated bulbs showed lower accumulation of these metabolites in the base plate. PAL and invertase activities were higher in outer scales, with invertase increasing over time and promoting sugar accumulation. After 120 days, sprouting in crates and bags was 1.63% and 0.42% in ethylene-treated bulbs versus 5.08% and 3.9% in controls, confirming reduced sprouting due to moderated metabolite flow.

Thymol Treatment under Ambient Storage

Thymol-treated bulbs showed slower increases of

glucose, fructose and sucrose in the base plate relative to controls, while outer and inner scales initially had higher sugar contents. After 120 days, sprouting in crates and bags was 2.5% and 1.7% in thymol-treated onions versus 5.08% and 3.9% in controls. Rotting was 15.4% and 11.6% in thymol-treated bulbs compared with 27.3% and 21.3% in untreated samples. Thus, thymol treatment significantly reduced both sprouting and rotting during ambient storage.

Ethylene and Thymol Treatments under Cold Storage

Under cold storage, sprouting progressed rapidly and reached higher levels within 60 days. Glucose and sucrose shifted from scales to base plate over time, with ethylene treatment moderating sucrose build-up. In crates and bags, sprouting after 60 days was 15.2% and 10.8% in ethylene-treated bulbs, 16.8% and 12.2% in thymol-treated, and 17.3% and 13.5% in controls. Rotting was 11.6% and 9.6% (ethylene), 9.6% and 9.4% (thymol) and 12.1% and 9.8% (control). Both ethylene and thymol reduced sprouting and rotting compared to untreated bulbs, with thymol offering slightly better rot control.

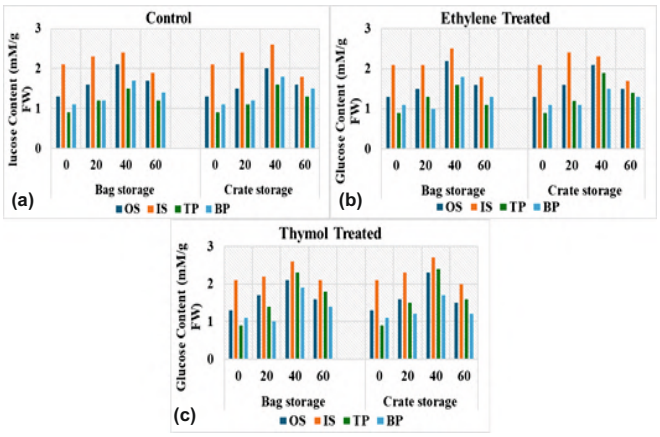
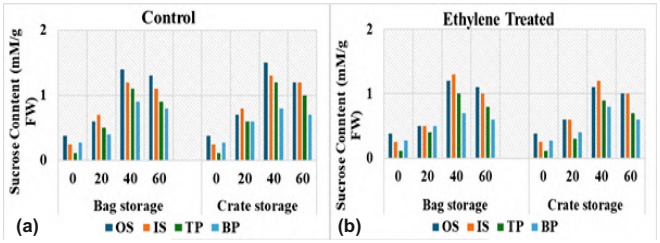


Fig. 34. Analysis of glucose content in onion bulb storage in bags and crates at cold storage, (a) (Untreated onions), (b) (Ethylene treated onions), (c) (Thymol treated onions); OS (Outer scale), IS (Inner scale), BP (Base plate), TP (Top plate).



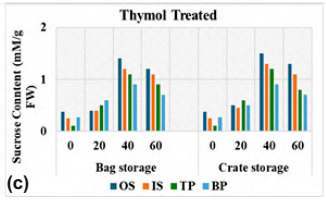


Fig. 35. Analysis of sucrose content in onion bulb storage in bags and crates at cold storage.

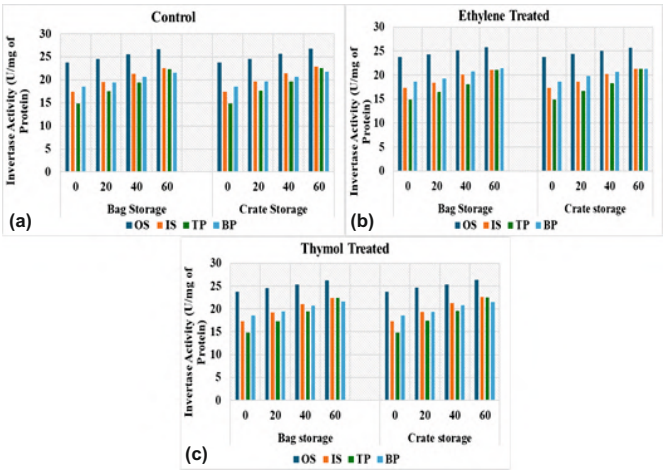


Fig. 36. Analysis of invertase activity in onion bulb storage in bags and crates at cold storage.

Bioplastic from Rice Straw Cellulose

Cellulose extraction from rice straw was optimized using a Box–Behnken design with three key variables: NaOH concentration (3–5%), extraction temperature (60–80 °C), and process time (1–3 h). A total of 17 experimental runs, including six center points, were conducted to evaluate important responses such as cellulose yield, water-holding capacity, bulk density, true density, and moisture content. The experimental data were analyzed using a quadratic model, which showed good agreement between predicted and observed values.Multi-response optimization using a desirability function approach generated 46 feasible solutions. The highest composite desirability value (0.939) was achieved at 3.88% NaOH, 62.73 °C, and 3 h. For practical application, these conditions were rounded to 4% NaOH, 63 °C, and 3 h. Validation experiments performed under these optimized conditions confirmed the model's accuracy, with residual errors ranging from 0.21% to 3.44%.The optimized cellulose exhibited favorable physicochemical properties, indicating its suitability as a sustainable raw material. This study demonstrates efficient rice straw utilization to produce cellulose for biodegradable bioplastics and eco-friendly packaging.

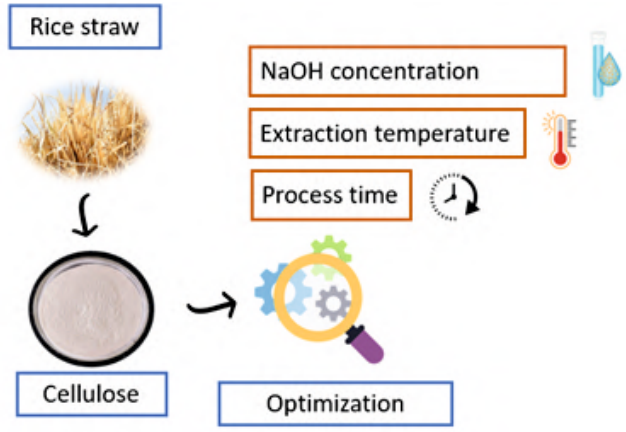


Fig. 37. Process flow and optimized conditions for rice straw cellulose extraction

Machineries/Processes/Products Developed by AICRP-PHET

Double head maize/ sweet corn seed sheller (UAS, Bangalore)

The Double Head Maize/Sweet Corn Seed Sheller was developed for efficient extraction of seeds from sweet corn cobs and is adjustable for shelling other maize varieties as well. The machine operates with a high shelling efficiency of more than 99%, ensuring minimal losses during processing. It has a capacity of 600–650 cobs per hour and provides an output of about 56–60 kg/h for sweet corn and around 110 kg/h for maize. The design ensures very low seed damage of less than 1%, while maintaining a seed germination rate of approximately 94%, making it suitable for seed processing and handling. The machine improves shelling efficiency, reduces manual labour, and is well suited for small and medium-scale seed processing operations.

Fig. 38. Double head maize/ sweet corn seed sheller

Small Millet Based Instant Mixes – Multipurpose spicy millet mix (UAS, Bangalore)

A small millet-based instant mix was developed to promote nutritious and convenient food preparation. The product is rich in nutrients, containing protein (14.1 g), dietary fiber (14.3 g), energy (375 kcal), iron (3.8 mg), calcium (67.10 mg), and zinc (2 mg). The mix requires no pre-preparation and can be prepared within 8–10 minutes, making it suitable for quick meal preparation. It can be used to prepare a variety of products such as spicy dosa, roti, and vada, thereby supporting diversified millet-based diets. The formulation does not contain any chemical additives, ensuring a natural and healthy food option.

Fig. 39. Multipurpose spicy millet mix

Pulsed Magnetic Field Treatment Protocol for Apple Juice (TNAU, Coimbatore)

A continuous pulsed magnetic field (PMF) system was developed consisting of a DC power supply, solid-state relay, timer/pulse generator, solenoid coil, glass treatment chamber, booster pump, and untreated and treated product tanks. Apple juice treated at 6 T for 15 minutes effectively preserved important quality parameters while improving microbial stability. Parameters such as colour, total phenols, titratable acidity, pH, and antioxidant activity were not significantly affected. The treated juice could be safely stored for up to 10 days under refrigerated conditions.

Fig. 40. Apple Juice

Chocolate Enrobing Machine (KAU, Tavanur)

A chocolate enrobing machine was developed for uniform coating of cookies with melted chocolate for small- and medium-scale production. The system includes a stainless-steel chocolate tank (21 cm × 30 cm, 3 mm thickness) housed inside a 42 L water tank heated by a 1500 W coil using the double-boiling principle to maintain a temperature of about 70°C. An agitator ensures smooth melting of chocolate, and the melted chocolate flows onto cookies carried by a food-grade stainless-steel conveyor operating at 9–39 rpm to control coating thickness. A blower removes excess chocolate, while a vibrating frame drains surplus chocolate into a collection tank for reuse.

Fig. 41. Chocolate Enrobing Machine

Preparation of Pet Snacks from Buffalo Meat Powder (MAFSU, Mumbai)

A process protocol was developed for producing pet snacks using buffalo meat powder. The technology produces about 2 kg of pet kibbles from 5 kg of buffalo meat with a power requirement of 12 kW per batch. The developed product is nutritionally balanced, shelf stable, and maintains desirable texture, flavour, and microbial safety. The production requires two personnel, including one technical staff member and one lab attendant. The production cost of the kibbles is approximately ₹2020 per kg, which corresponds to about ₹1.08 per kibble.

Fig. 42. Pet Snacks from Buffalo Meat Powder

Brown rice flaking machine (AAU, Jorhat)

A dedicated brown rice flaking machine was developed to overcome the limitations of conventional paddy flaking machines, which are unsuitable for brown rice due to differences in grain hardness, moisture profile, and absence of husk, often resulting in low yield, high breakage, and husk contamination. The machine consists of a feed hopper, hardened flaking rollers, power transmission system, and flakes discharge unit mounted on a rigid mild steel frame to ensure stability and reduced vibration. The rollers are driven by an electric motor through a belt–pulley system with adjustable speeds of 200–500 rpm to optimize flaking efficiency. The machine produces a higher proportion of whole flakes with minimal breakage and zero husk contamination. It has a processing capacity of about 50 kg/h, requires one person for operation, and costs approximately ₹35,000 per unit. Proper moisture adjustment and roasting of brown rice are required prior to flaking to achieve optimum flake quality and yield, making the technology suitable for small-scale rural processing and value addition of brown rice.

Fig. 43. Brown rice flaking machine

Automation of Mango Bar Sheet Production (IIT, Kharagpur)

An automatic fruit bar sheet machine was developed with a capacity of 3.89 kg/h. The system costs approximately ₹5.5 lakh and requires a power input of 16 kW with one operator for operation. Mango pulp is fed into a pulper connected to a dryer feeder where the pulp spreads in a thin layer over a Mylar belt. The dried fruit bar sheet is then collected using an automatic cutter into marketable sizes. The machine produces mango bar sheet at an estimated cost of about ₹20 per kg while contributing to carbon credit through efficient processing.

Fig. 44. Automation of Mango Bar Sheet Production

IoT Sensor-Based Aeration System for Household Rice Storage Bin (OUAT, Bhubaneswar)

An IoT-based aeration system was developed to ensure safe storage of rice in a 50 kg household storage bin. The system integrates a DHT11 temperature and humidity sensor, Node MCU microcontroller, relay module, solenoid valve, and a 5 V DC exhaust fan. When the internal temperature exceeds 35°C and relative humidity rises above 70%, the system automatically activates aeration to improve air circulation. After six months of storage, rice stored with aeration maintained a moisture content of 12.08% compared to 14.77% without aeration, preventing lump formation and insect infestation.

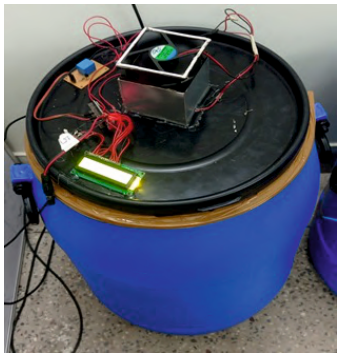


Fig. 45. IoT Sensor-Based Aeration System

Infrared Dryer-cum-Treater (Conveyor Type) (PAU, Ludhiana)

An infrared dryer-cum-treater (IR-DCT) was developed for controlled infrared-based drying and treatment of agricultural commodities in both batch and continuous modes. The unit consists of an infrared curing chamber, air and material handling systems, and a control panel. The system uses quartz short-wave infrared emitters with a total heat load of 9 kW. Two axial fans ensure proper heat circulation and cooling of emitters. The equipment is fitted with a variable-speed Teflon mesh conveyor belt for continuous processing and includes a phase-angle thyristor control system for temperature regulation and safety.

Fig. 46. Infrared Dryer-cum-Treater

Rotary Dryer-cum-Flavor Coating Machine for Coconut Chips (CPCRI, Kasaragod)

A rotary dryer with a horizontal cylindrical stainless-steel drum was developed for drying and flavour coating of coconut chips. The drum has a radius of 120 cm and a length of 30 cm and operates at 9 rpm with a slope of 15%. The system is equipped with a 1 HP aspirator and a 1 kW heater coil capable of maintaining air temperatures between 40–120°C. The drum has a capacity of about 7 kg and reduces drying time by nearly 50% while ensuring uniform flavour coating and reduced power consumption.

Fig. 47. Rotary Dryer-cum-Flavor Coating Machine

Biomass Gasifier Unit (RARS Anakapalle)

A biomass gasifier unit integrated with a solar photovoltaic system was developed for jaggery production. The solar PV system operates a 7.5 hp four-roller sugarcane crusher, while the biomass gasifier is used for boiling sugarcane juice. The thermal efficiency of the gasifier was recorded at 33.3% compared to 24.67% for the conventional furnace. Bagasse consumption reduced from 27.5% to 22% of cane weight, and the jaggery

production time decreased from 215 minutes to 140 minutes. The solar PV system saved about 6.7 kWh of energy while crushing 670 kg of cane and reduced the carbon footprint from 5.29 to 2.39 tonnes of CO_2e per year.

Fig. 48. Biomass Gasifier Unit

Machineries/Processes/Products Developed by AICRP-PEASEM

Modular Water Harvesting Structure using Plastic Waste

A modular water-harvesting structure using plastic waste was developed by JAU, Junagadh center, using HDPE plastic waste to prepare construction blocks. Modular plastic blocks were designed, a die was fabricated, and the blocks were successfully produced from recycled HDPE. Based on detailed hydrologic and hydraulic analyses, the water harvesting structure was designed and constructed across a small stream. Stability analysis against overturning, crushing, and sliding confirmed that the structure was safe and stable under applied pressures. The constructed structure demonstrated effective performance, harvesting approximately 700 m³ of rainwater in a single filling. It was filled about 5 times in 2024 and 8 times in 2025, nearly 9,100 m³ of water recharge. A comparative cost–benefit analysis between the modular plastic block structure and a conventional UCR masonry structure showed that the modular structure was more economical, costing about ₹1.10 lakh compared to ₹1.40 lakh for the UCR masonry structure, thereby establishing its economic viability

Fig. 49. Modular Water Harvesting Structure using Plastic Waste

Modular Plastic based Evaporative Cooling Storage Structure (ECSS) for Horticultural Produces

A cold storage structure (ECSS) was developed by JAU, Junagadh center to provide an efficient on-farm solution for post-harvest management of horticultural produce. The system enables farmers to store up to 2.5 tons (9 m³) of fruits and vegetables immediately after harvesting and extends shelf life from 8 to 28 days, thereby reducing post-harvest losses by about 20–25 %. The modular, foldable FRP-based structure is easy to handle, transport, and install, and operates on solar energy without grid electricity. It ensures better produce quality, helps farmers obtain higher market prices, and is durable, cost-effective, and environmentally friendly. Overall, the developed ECSS is economically feasible for reducing post-harvest losses and maintaining quality.

Fig. 50. Modular Plastic based Evaporative Cooling Storage Structure

Portable Solar Irrigation System for Hilly Region

A portable solar irrigation system was developed by Almora Center suitable for hilly regions. It features a lightweight design weighing 21 kg for easy mobility. It includes a battery backup to ensure consistent water discharge. It is designed to operate efficiently with minimal investment, making it a practical and cost-effective solution for small-scale irrigation in challenging terrain. The discharge rate is 12 liters per minute at 15 m head with a 180 W surface DC pump. It is a cost-effective solution for small-scale irrigation in challenging terrains.

Fig. 51. Portable Solar Irrigation System

Animal Shelters for Semi-intensive Yak Rearing

Animal shelters was developed by ICAR-NRCY, Dirang for semi-intensive yak rearing in the high-altitude areas of West Kameng district, Arunachal Pradesh. Two types of animal shelters were designed and evaluated for semi-intensive yak rearing: a shelter with a shade net roof and a shelter with an FRP roof. One-month observations showed that animals preferred the FRP roofed shelter over the shade net roofed shelter. It was also observed that animals mainly used the FRP shelter for feeding and sheltering during the night and early morning hours from 5.00PM to 9.00AM .

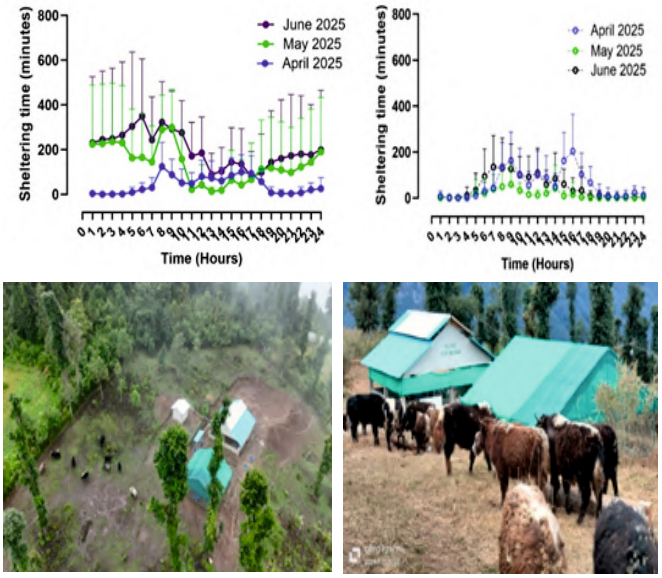
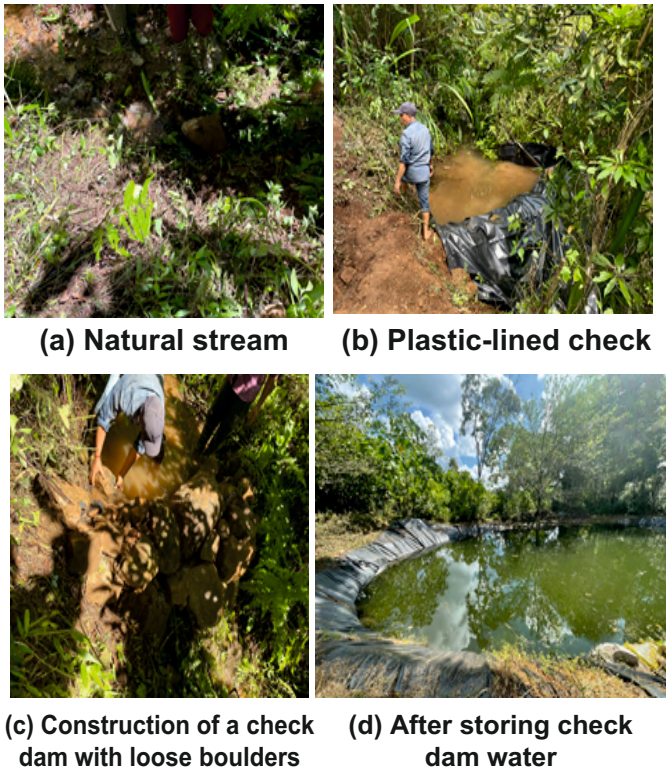


Fig. 52. Time spent in Shade net roof shelter

Flexible Check Dam for the Conservation of Water

Natural streams were effectively utilized for water conservation through the construction of a flexible check dam at ICAR-NEH, Barapani, Umiam. The runoff intercepted by the check dam was guided in a controlled manner and diverted into a plastic-lined pond for storage. The check dam temporarily impounded stream water, collecting approximately 1.66 m³, while the diverted runoff accumulated in the plastic-lined pond amounted to 122.57 m³ over a duration of 44.25 hours. Provision was also made for safe disposal of excess water through a plastic-lined outlet channel to prevent overtopping and damage to the pond structure. This system demonstrates an efficient approach for harvesting and conserving stream water using flexible and low-cost interventions.



(a) Natural stream **(b) Plastic-lined check**

(c) Construction of a check dam with loose boulders **(d) After storing check dam water**

Fig. 53. (a-d) Flexible Check Dam for the Conservation of Water

Reusable plastic-based vertical farming structure

A reusable plastic-based vertical farming structure was designed and developed by the MPUAT Udaipur center. The vertical tower has a length of 2380 mm and a diameter of 270 mm, with PVC elbows measuring 340 mm in diameter. The tower occupies 0.41 m² and can accommodate 36 plants simultaneously. The total weight of the structure is 6 kg (dry) and 24 kg (wet).

Fig. 54. Reusable plastic-based vertical farming structure

CRP ON SA

Reformation of Makhana processing and Value-Addition industry through mechanization and Automation

Makhana Seed Collection System

Makhana (Euryale ferox) also known as Gorgon Nut or Fox Nut is an aquatic crop, traditionally cultivated in the stagnant water bodies. The seeds sink in the water and settle at the pond from where it is collected for further processing into popped makhana. The seeds are collected manually at present, which is labour intensive, costly and inefficient. Usually, fishermen go in a pond 3-4 times at an interval of 15 days to collect the seeds. The average labour charge paid by the farmer is Rs. 60/- per kg seed. Therefore, a mechanised makhana seed collection system was developed by ICAR-CIPHET Ludhiana to improve efficiency, reduce drudgery and in a cost-effective manner. The developed makhana seed collection system comprises a floating base on which specifically designed self-priming slurry pump operated by engine, controlled collection chute, washing screen, system to prevent sinking of collection chute in mud, and an engine operated outboard propellor motor to move the floating base in the water. The pump lifts the mud, seeds, small debris, and water through the collection chute and discharges it on the washing screen where the mud is washed and seeds along with impurities are retained on the screen. One skilled person can operate the system. The system simultaneously collects and washes the seeds and is suitable for operating in ponds having water depth in the pond between 0.60 m to 2.50 m. The system can collect the seed from one acre pond in one day (about 700-800 kg seed/day).

Fig. 55. Makhana Seed Collection System

X-ray imaging for internal quality of roasted makhana seed

An automated system for sorting roasted and popped makhana seeds was undertaken with the objective of detecting insect infestation and internal defects using X-ray imaging and developing a non-destructive, high-precision sorting solution for processed makhana. The system integrates an X-ray imaging unit with image acquisition and processing software for automated inspection and classification of roasted makhana seeds and pops. The initial trials on X-ray imaging have been carried out. The system was set to operate within a voltage range of 10–80 kVp (eight levels) and a current range of 0.5–3 mAp (six levels), with image outputs generated in DICOM, TIFF, and JPEG formats. Based on the trial runs, we were able to generate a distinguished image and can differentiate a healthy and internal defected seed.

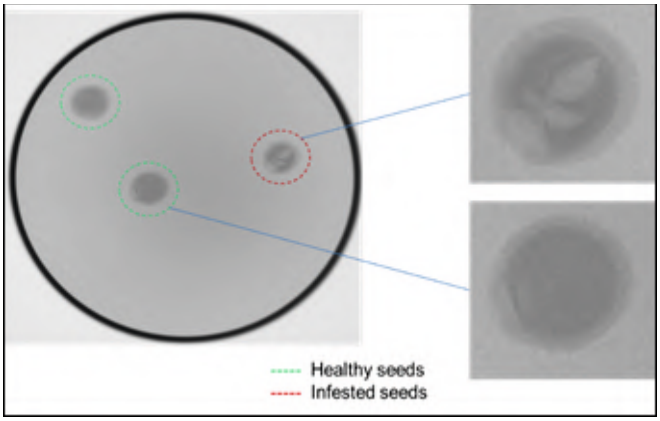


Fig. 56. X-ray imaging-based differentiation of healthy and infested roasted makhana seeds

Makhana based instant pasta

A novel value-added makhana-based instant pasta was developed utilizing makhana by-products, with the objective of improving by-product valorization and diversifying makhana-based convenience foods. The formulation incorporated chickpea flour and potato flour, wherein chickpea flour contributed to enhanced protein content, improved amino acid balance, and better structural integrity, while potato flour imparted desirable binding properties, improved water absorption, and facilitated rapid rehydration. The developed instant pasta was designed for reconstitution solely by immersion in hot water without additional heating, analogous to cup-type instant noodles, thereby emphasizing consumer convenience and energy efficiency. The product was evaluated for key cooking properties, including rehydration time, cooking loss, and water absorption capacity, to assess its functional and processing performance. Detailed analyses related to nutritional composition, textural characteristics,

sensory acceptability, and storage stability are currently in progress. Furthermore, the standardized formulation is being extended to other pasta geometries, namely elbow and spiral shapes, to evaluate its adaptability to different shaping conditions and processing feasibility, which is presently under process.

Fibre-enriched pasta using mechanically separated pea pod fibre rich fraction

Pasta is a globally appreciated food product, valued for its ease of preparation and sensory appeal. However, traditional pasta made from refined wheat flour is low in dietary fiber, which limits its nutritional benefits. Dietary fiber plays a vital role in improving digestive health, lowering blood cholesterol, and reducing the risk of chronic diseases. In this context, enhancing pasta with natural fiber sources can offer both nutritional and functional benefits. The use of agro-industrial by-products like pea pods present an eco-friendly and cost-effective approach to fortify food while addressing sustainability. The present study was aimed to develop fiber-enriched pasta by gradual replacement of semolina (0-30%) with pea pod fiber which was mechanically separated from pea pods. Pea pod fibre incorporation significantly influenced cooking properties. The water absorption index as well as gruel solid loss increased with increasing pea pod fiber level reaching maximum to 1.83 and 1.91% at 30% level, respectively. The cooking time was inversely proportional to pea pod fiber level, decreasing from 8.58 min in the control (0% pea pod fibre) to 6.54 min in pasta with 30% pea pod fibre, possibly due to fiber interfering with starch gelatinization and network formation. The increased volume expansion ratio (VER) with pea pod fibre level suggested better swelling behavior and structural expansion during cooking. Color analysis revealed a noticeable shift in visual attributes with increased fiber. Lightness (L*) decreased consistently from 79.34 (control) to 71.52 at 30%, indicating a darker product. The fat content remained relatively stable between 1.47% and 1.58%, suggesting minimal effect from fiber addition. Protein content showed a gradual decline from 15.47% in the control to 13.84% in pasta with 30%, likely due to the dilution effect as more fiber was incorporated into the formulation. Ash content, indicative of mineral content, increased with fiber level, from 1.83% in the control to 2.28% at 30%, while TDF content increased significantly with the incorporation of pea pod fiber and ranged between 7.26% (control) to 22.03% (30% pea pod fibre level), supporting the nutritional enhancement of pasta through fiber fortification. Moisture content generally declined from 6.35% (control) to 5.21–5.81% in enriched samples, potentially due to the water-binding nature of dietary fiber, thereby reducing the free moisture. The organoleptic evaluation of pasta samples indicated that the pea pod fibre could be incorporated in the formulation up to 15% level with an overall acceptability score of 7.25. In conclusion, mechanically separated pea pod fibre fractions can be effectively incorporated up to 15% level to produce nutritionally enhanced pasta with acceptable cooking characteristics, offering a sustainable and functional alternative for health-conscious consumers.

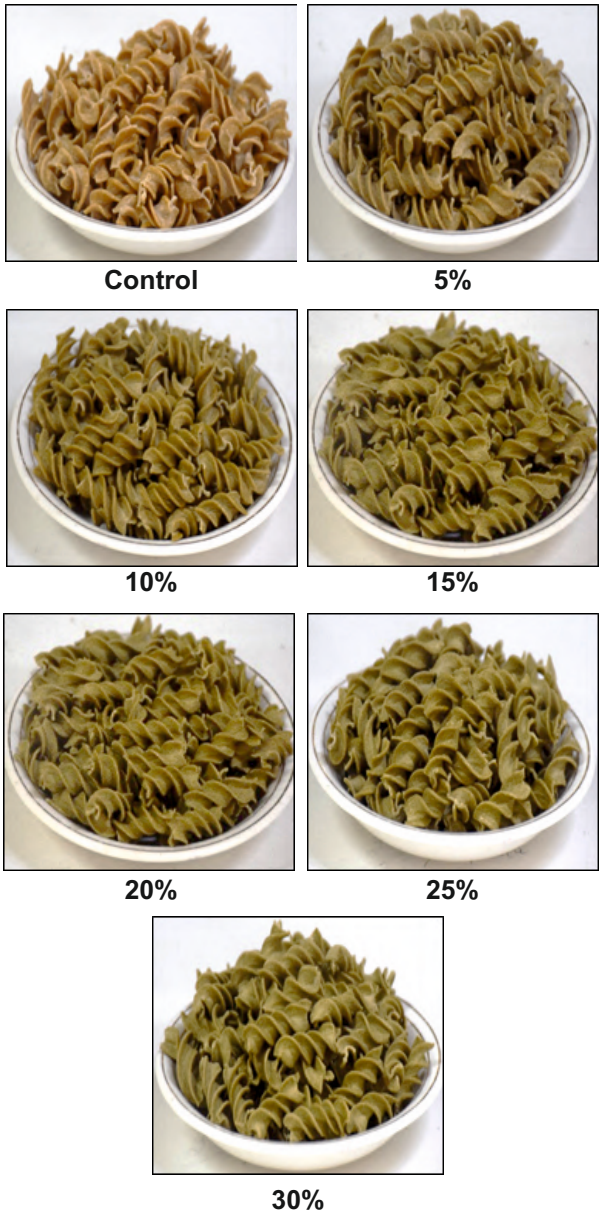


Fig. 57. Pea pod fibre incorporated pasta

Awards and Recognition

Name of the awardee	Name of award
Rajesh Kumar Vishwakarma	"Mithila Vibhuti" conferred by the Vidyapati Seva Sansthan, Darbhanga, Bihar in recognition of his outstanding contributions to the field of makhana research.
Amit Nath	Third Position as "Best Exhibition Stall by Government Institutes" during the 1st Nagaland Banana Festival 2025 cum National Workshop on Theme: Banana for Food-Fiber-Future during 22nd to 24th, October 2025 at Wokha, Nagaland.
Surya Tushir	Best oral presentation award by PAU, Ludhiana
	First in oral presentation by ICAR-CIWA, Bhubneswar during Global Conference on IIGASA (8-10 March,2025)
Deepika Goswami	Best Scientist Award by ICAR-CIPHET, Ludhiana
Manju Bala, Deepika Goswami, Mridula D., R K Vishwakarma and Nachiket Kotwaliwale	ICAR Technology Award for 'Process Technology for extraction of hesperidin from immature dropped kinnow fruits' by ICAR, New Delhi
Guru P. N.	First Prize in Oral presentation in International symposium on Mechatronics and Robotics in Pre and Post production Agriculture jointly organized by ISAE, New delhi and ICAR-CIAE, Bhopal during 10-12 November, 2025.
	ISAE Team award 2025 presented for Reformation of Makhana through Mechanization of Harvesting, Processing and Value addition by ISAE, New Delhi and ICAR-CIAE, Bhopal
Swati Sethi	Best oral presentation award (2nd) for paper entitled "Optimization of Millet-Based Extruded Snacks with Special Dietary Requirements" in the Global Conference on 'Innovations to Impact: Gender Transformative Approach for Sustainable Agri-Food System (IIGASA-2025) held from March 8–10, 2025 at ICAR-CIWA, Bhubaneswar, Odisha.
Poonam Choudhary	Best Paper presentation of Navjot Kaur, Hamid, Poonam Choudhary and Sandeep Mann (2025) received certificate of Best Paper presentation and secured First prize in the International Conference on Advances in Agriculture and allied Sciences: Challenges and Solutions (AAAS:CS) held at NIT, Hamirpur during March 21&22, 2025.
	Second position in Oral presentation of Navjot Kaur, Hamid, Poonam Choudhary and Sandeep Mann (2025) received second position in oral presentation in International conference on Recent Trends in Smart and Sustainable Agriculture for Food and Nutrition Security at Lovely Professional University, during 27-28th November 2025.
Abhinav Dubay	ANRF-Prime Minister Early Career Research Grant-2025
	Young scientist award for distinguished service below 5 years at 37th Foundation Day, ICAR-CIPHET, Ludhiana
	Best oral presenter award for the Paper presented entitled "Smart Vibration Sensing and Machine Learning for Non-Destructive Estimation of Tender Coconut Water Volume" at National Conference on "Food Innovations, Food Allergies and Traditional Foods" (FIFATF -2025) at Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, Punjab, 11 -12 December 2025.
Leena Kumari	Best Oral presentation award during Global Conference 2025 on "Innovations to Impact: Gender Transformative Approach for Sustainable Agri - food Systems" organized by ICAR-CIWA, Bhubaneswar, 8-10 March 2025

	Got 2nd best oral prize for the paper presented in राष्ट्रीय हिंदी वैज्ञानिक संगोष्ठी (ऑनलाइन) दृष्एग्रीकल्चर 4.0 के युग में कृषि यंत्रीकरणरू सतत् खाद्य उत्पादन हेतु नवोन्मेषी एवं समाजोन्मुखी प्रौद्योगिकी के माध्यम से भारतीय कृषि प्रणाली का सशक्तिकरण'' organized under हिंदी पखवाड़ा समारोह 2025 2025 at CIAE Bhopal.
Shaghaf Kaukab	Best Paper presentation award" during National seminar on "Progresive Agriculture-Viksit Bharat: Preparedness for Eastern Region" (PAVER-2025) organised by ICAR-RCER, Patna in collaboration with Indian Society of Agronomy BAU Chapter, Sabour during 21-23, February 2025.
	Best oral presentation award" during Global Conference-2025 on, "Gender Transformative Approach for Sustainable Agri-food Systems (IIGASA–2025) during March 8 to 10, 2025 organised by ICAR-CIWA & RAGA.
	Best Paper presentation award" during National Seminar ICSSR Sponsored National Seminar on "Vision Viksit Bharat@2047: Fostering Inclusive Societal Development through Health and Wellness for All" on February 28, 2025.
Renu Balakrishnan	Young Women Scientist Award-2025 by Society for Community Mobilization for Sustainable Development
Renu Balakrishnan*, Sandeep Mann, Soumya Mohapatra, Rajiv Sharma	Best Paper -2025 for the oral presentation of "Economic and Rural Impact of Agro-Processing Centers (APC) in Punjab" in 12th National Seminar on "Futuristic Agriculture: Technology, Sustainability and Beyond" organized by Society for Community Mobilization for Sustainable Development at Umiam, Meghalaya
Vikas Kumar	हिंदी साहित्य के क्षेन में उत्कृष्ट योगदान हेतु साहित्य शिरोमणि सम्मान से सम्मानित by निर्मल रोशन साहित्यिक मंच, न्यू जर्सी, अमेरिका
	प्रभारी, राजभाषा प्रकोष्ठ के रूप में वर्ष 2024–25 के लिए राजभाषा में किए गए उत्कृष्ट कार्य हेतु बड़े केंद्रीय सरकारी कार्यालयों की श्रेणी में नगर राजभाषा कार्यान्वयन समिति के स्तर पर सीफेट को 'तृतीय पुरस्कार' एवं डॉ. विकास कुमार को उत्कृष्ट कार्य निष्पादन हेतु दिनांक 03–09–2025 को आयकर भवन, सिविल नगर, लुधियाना में राजभाषा पुरस्कार दिया गया।
Shilpa S Selvan	"Best Scientist Award" under the AICRP on PEASEM Scheme Annual Workshop held at ICAR-VPKAS, Almora, Uttarakhand during 30th October to 01st November 2025.
	Received the First prize in Oral presentation on "Development of different cellulose extraction process through valorisation of rice straw and its characterization" in the 59th ISAE annual convention held from 10th to 12th November 2025 at ICAR-CIAE, Bhopal, Madhya Pradesh.
Ravi Prakash	Best Early Career Researcher Poster Award –Special Mention Sponsored by Future Food Journal, Elsevier. Awarded during "Future Food Congress -2025 (International Conference)" in Singapore, 16 June 2025 to 18 June 2025.
	"Travel Grant Award from ANRF, Govt. of India" for a paper presentation and participating in Future Foods Congress 2025, Singapore.

Recognition

10 years & 25 Years Service Completion Awards at ICAR-CIPHET

Name of the Official	Designation
10 Years Service	
Dr. Indore Navnath Sakharam	Senior Scientist
Dr. Akhoon Asrar Bashir	Senior Scientist
25 Years Service	
Dr. Rajesh Kumar Vishwakarma	PC (PHET)

Technology Commercialized

The institute has commercialized 11 technologies to 20 licensees, generating a total revenue of 31.20 lakh during 2025.

Title	Contracting party	Date of licensing	Licensing fee (Rs.)
Process for Preparation of Fat Free Flavoured Makhana (Patent No.: 420645)	Mr. Anuj Sharma, S/O Mr. Sushil Sharma, #4152, Street No. 1, Gagandeep Colony Kailash Nagar, Ludhiana, Punjab- 141001	05 Feb 2025	50000
	M/s Dshell (OPC) Private Limited, C-1/254, Sector-51, Noida, Gautam Buddha Nagar, Uttar Pradesh-201301	19 June 2025	50000
	Mr. Yash Roda, C/O Mr. Pawan Kumar Verma, D 54/16 B5/5, Luxa, Mari Mata Mandir, Chhitupur, PO: Mahmoorganj, District Varanasi, Uttar Pradesh - 221010	28 Nov 2025	50000
	M/s A3S4 Food International, Shop No.3, G.N.E Colony, Ludhiana, Punjab-141013	03 Dec 2025	50000
Cereal-Gluten Free Pasta with Semi-Popped Makhana	Mr. Anuj Sharma, S/O Mr. Sushil Sharma, #4152, Street No. 1, Gagandeep Colony Kailash Nagar, Ludhiana, Punjab- 141001	05 Feb 2025	50000
Process for Preparation of Makhana Puffs	Mr. Anuj Sharma, S/O Mr. Sushil Sharma, #4152, Street No. 1, Gagandeep Colony Kailash Nagar, Ludhiana, Punjab- 141001	05 Feb 2025	50000
Ready to Constitute Makhana Kheer Mix (Patent No. 287541)	Mr. Anuj Sharma, S/O Mr. Sushil Sharma, #4152, Street No. 1, Gagandeep Colony Kailash Nagar, Ludhiana, Punjab- 141001	05 Feb 2025	50000
	M/s Dshell (OPC) Private Limited, C-1/254, Sector-51, Noida, Gautam Buddha Nagar, Uttar Pradesh-201301	19 June 2025	50000
Groundnut Based Flavoured Beverage, Curd and Paneer	M/s MKD Organic Farm Products, V.P.O. Mathurapur, Distt. Rampur (U.P.)-244922	18 Feb 2025	50000
	M/s Sarsha Imex (OPC) Private Limited, Ground Floor, No.1, Kali Kadamba Nilaya,Near Filter House, KB Extension, Chitradurga, Karnataka, 577501 (GST No.: - 29AAZCS0593C1ZT) through its representative Mr. Harshavardhan, R.N.	25 Feb 2025	50000
Mechanized System for Popping and Decortications of Makhana Seeds (Patent No. - 434144)	M/s Videhanutra India Private Limited, Ward 06, Barun Kashyap s/o Saroj Kumar Jha, Umari Post Office, Balia, Madhubani, Bihar-847403 (GST No.: 10AAKCV3465B1ZP) through its representative Mr. Barun Kashyap	25 Feb 2025	160000
	M/s BlackNut AgriFood Machinery Pvt. Ltd., Regd. Office: First Floor ,1127, Shri Krishna Complex Bengali Mohalla, Ambala Cantt -133001, Haryana	15 April 2025	160000
	M/s Dshell (OPC) Private Limited, C-1/254, Sector-51, Noida, Gautam Buddha Nagar, Uttar Pradesh-201301	19 June 2025	1400000
Mechanized System for Primary Roasting of Raw Makhana Seeds and Process Thereof (Patent Application No. - 202011037651)	M/s Videhanutra India Private Limited, Ward 06, Barun Kashyap s/o Saroj Kumar Jha, Umari Post Office, Balia, Madhubani, Bihar-847403 (GST No.: 10AAKCV3465B1ZP) through its representative Mr. Barun Kashyap	25 Feb 2025	50000

Microbial Method for Production of Protein Isolate/Concentrate From Oilseed Cakes/Meals (Indian Patent No. – 407257)	M/s Prakrutisaar Pvt.Ltd., Maharashtra	04 March 2025	300000
	M/s Central Biotech Private Limited, 81/3, At Po. – Heti Surla, Tah.- Saoner, District Nagpur- 441112 (M.S.)	19 March 2025	300000
Pearl Millet Based Composite Extrudates	M/s Mahima Healthy Foods, A2/154, 155, Ground Floor and First Floor, New Kondli, Delhi - 110096 through its Proprietor Mr. Himanshu Aggarwal	19 June 2025	50000
	Ms. Sandhya Sahu Z-07, Empressia Earth E3, Opposite Dunda govt. School, Old Dhamtari Road, Kandul, Raipur, 492013	18 Nov 2025	50000
Sorghum Based Extrudates	M/s Mahima Healthy Foods, A2/154, 155, Ground Floor and First Floor, New Kondli, Delhi - 110096 through its Proprietor Mr. Himanshu Aggarwal	19 June 2025	50000
Solar Powered Universal Insect Trap (Day/Night)	M/s Parashar Agrotech Bio Pvt Ltd S15/2-14-4-5, Mohankunj Apartment, Ghousabad, Varanasi - 221002,	28 July 2025	100000

Patent & Copyright

Patent Granted

Title	Application/ Registration No.	Inventors	Date of Filing	Date of grant	Application Granted
Microbial Method for Production of Protein Isolate/Concentrate from Oilseed Cakes/Meals	17/258088	D.N. Yadav Sangita Bansal R.K. Singh S.N. Jha	21 May 2020	29 April 2025	US 12285029 B2

Patent Filed

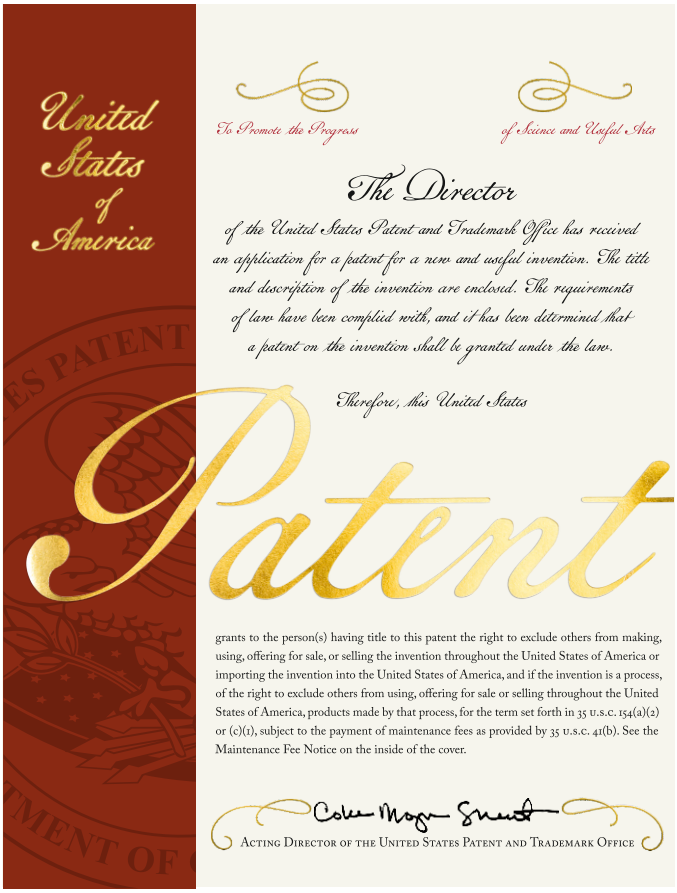
Title	Application/ Registration No.	Date of filing	Inventors
Small-Scale LPG-Powered Continuous Rice Puffing System with Enhanced Insulation and Process Thereof (AICRP-PHET)	202511022215	12 March 2025	Niraj Kumar Mishra S. Patel Dharmendra Khokhar R. K. Naik
Integrated Mechanized System and Method for Producing Hawaijar, A Fermented Soybean Product	202511041218	29 April 2025	Thingujam Bidyalakshmi K.Bembem Surya Tushir Ng.Joykumar
On - Farm Maize Cob Dryer	202511062572	01 July 2025	Pankaj Kumar Shagaf Kaukab Sumit Kumar Aggarwal Swati Sethi Ranjeet Singh Nachiket Kotwaliwale
Chemical-Free Process for Producing Dietary Fiber Enriched Powder from Pisum Sativum Pod Shells	202511062842	01 July 2025	Manju Bala Deepika Goswami Surya Tushir R.K. Vishwakarma Nachiket Kotwaliwale
Solar Powered Universal Insect Trap	202511071594	28 July 2025	Guru P. N. Sumit B. Urhe Purnendra Shekar Pandey Sukhwinder Singh Sekhon Nachiket Kotwaliwale
Popped Makhana Grading Machine	202511077426	14 Aug 2025	Rajesh Kumar Vishwakarma Mridula Devi Guru P. N. Shyam Narayan Jha Ranjeet Singh
Solar-Powered Mobile Poultry Processing Cart	202511097033	08 Oct 2025	Santosh Upadhyay Saurabh Kumar Laskar Ankur Das Protiva Gogoi Deepshikha Deuri
Reinforced Clay Pot Smoking Unit with Integrated Electric and Smoke Control System	202511096795	08 Oct 2025	Ankur Das Saurabh Kumar Laskar Santosh Upadhyay Protiva Gogoi Deepshikha Deuri

Design filed

Title	Date of Filing	Application/ Registration No.	Inventors
Modular Plastic Block	22 Jan 2025	445105-001	AICRP-PEASEM
Agrivoltaic Greenhouse	22 Jan 2025	445108-001	

Copyright Filed

Title	Diary No.	Date of filing	Authors
Near Infrared Spectral Dataset for Detection and Quantification of Grass Pea/Khesari Flour Adulteration in Chickpea Flour	7706/2025-CO/L	06 March 2025	Manju Bala Swati Sethi Sanjula Sharma Mridula D. Gurpreet Kaur Dhritiman Saha Nachiket Kotwaliwale
Near Infrared Spectral Dataset for Detection and Quantification of Metanil Yellow Adulteration In Chickpea Flour	8037/2025-CO/L	08 March 2025	Manju Bala Swati Sethi Sanjula Sharma Mridula D. Gurpreet Kaur Dhritiman Saha Nachiket Kotwaliwale
Continuous Plant for Protein Production	CF-22179/2025-CO	02 June 2025	Surya Tushir Manju Bala Sandeep Mann D.N. Yadav Nachiket Kotwaliwale



United States of America

To Promote the Progress of Science and Useful Arts

The Director of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Acting Director of the United States Patent and Trademark Office

US012285029B2

(12) **United States Patent**
Yadav et al.

(10) **Patent No.: US 12,285,029 B2**
(45) **Date of Patent: Apr. 29, 2025**

(54) **MICROBIAL METHOD FOR PRODUCTION OF PROTEIN ISOLATE/CONCENTRATE FROM OILSEED CAKES/MEALS**

(71) Applicant: **Indian Council of Agricultural Research**, New Delhi (IN)

(72) Inventors: **Deep Narayan Yadav**, Ludhiana (IN); **Sangita Bansal**, New Delhi (IN); **Rajesh Kumar Singh**, Ludhiana (IN); **Shyam Narayan Jha**, New Delhi (IN)

(73) Assignee: **Indian Council of Agricultural Research**, New Delhi (IN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1059 days.

(21) Appl. No.: **17/258,088**

(22) PCT Filed: **Mar. 27, 2020**

(86) PCT No.: **PCT/IN2020/050287**
§ 371 (c)(1),
(2) Date: **Jan. 5, 2021**

(87) PCT Pub. No.: **WO2020/202185**
PCT Pub. Date: **Oct. 8, 2020**

(65) **Prior Publication Data**

US 2021/0282428 A1 Sep. 16, 2021

(30) **Foreign Application Priority Data**

Mar. 29, 2019 (IN) 201911012570

(51) **Int. Cl.**
A23J 1/12 (2006.01)
A23J 1/14 (2006.01)
A23J 3/16 (2006.01)
C12N 1/20 (2006.01)
C12P 21/00 (2006.01)
C12R 1/225 (2006.01)
C12R 1/23 (2006.01)

(52) **U.S. Cl.**
CPC ***A23J 1/125*** (2013.01); ***A23J 1/142*** (2013.01); ***A23J 1/148*** (2013.01); ***A23J 3/16*** (2013.01); ***C12N 1/20*** (2013.01); ***C12P 21/00*** (2013.01); *C12R 2001/225* (2021.05); *C12R 2001/23* (2021.05)

(58) **Field of Classification Search**
CPC .. A23J 1/125; A23J 1/142; A23J 1/148; A23J 3/16; A23J 1/14; A23J 3/14; C12N 1/20; C12P 21/00; C12R 2001/225; C12R 2001/23
See application file for complete search history.

(56) **References Cited**

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Sharma et al. (2014, J Food Sci Technol, DOI 10.1007/s13197-013-0959-1) {herein Sharma} (Year: 2014).*
Miami Water & Air (2024, https://www.miamiwaterandair.com/does-soft-water-affect-the-ph-balance-of-water/#: :text=Most) {herein Miami Water & Air}. (Year: 2024).*
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Vartoukian et al. (2010, minireview, DOI:10.1111/j.1574-6968.2010.02000.x) {herein Vartoukian}. (Year: 2010).*
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International Search Report & Written Opinion for PCT/IN2020/050287 dated Aug. 27, 2020, 11 pages.

* cited by examiner

Primary Examiner — Paul J Holland
Assistant Examiner — Erica Nicole Jones-Foster
(74) *Attorney, Agent, or Firm* — Blank Rome LLP

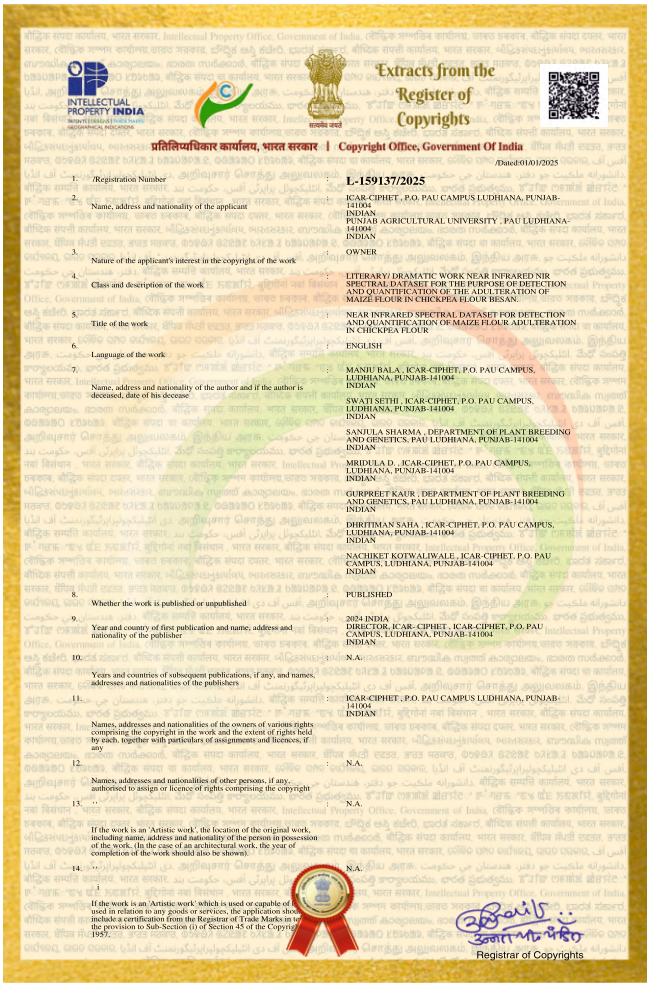
(57) **ABSTRACT**

Alkaline extraction followed by acid precipitation or ultra-filtration method for preparation of protein isolates from oilseeds cakes/meals is followed. The strong alkaline and acidic conditions alter the functional properties of the protein, which adversely affects its quality. The present invention provides a microbial based process to produce protein isolates/concentrates from oilseed cakes/meals or from other similar type of sources either plant or animal origin without addition of strong or diluted acid. The protein is extracted in aqueous media or alkaline aqueous media with or without containing specified salt for specified duration. The extract is centrifuged, mixed with known microbial culture (the process is not limited to the particular strain) and incubated at particular temperature and duration. The precipitated protein is recovered and dried to get protein isolates/concentrates. The process is convertible to purely chemical free process as extraction of protein in potable water, precipitation of protein using microbial culture followed by drying.

12 Claims, 1 Drawing Sheet

Copyright Registered

Title	Registration No.	Date of filing	Date of Registration	Authors
Near Infrared Spectral Dataset for Detection and Quantification of Maize Flour Adulteration in Chickpea Flour	L-159137/2025	10 Oct 2024	01 Jan 2025	Manju Bala Swati Sethi Sanjula Sharma Mridula D. Gurpreet Kaur Dhritiman Saha Nachiket Kotwaliwale
Stereo Depth Based Detection and Localization Module for Apples	SW-20130/2025	21 Nov 2024	28 Jan 2025	Shagaf Kaukab Yogesh B. Kalnar K. Narsaiah Bhupendra M. Ghodki
Near Infrared Spectral Dataset for Detection and Quantification of Pea Flour Adulteration in Chickpea Flour	LD-20250165764	08 March 2025	29 June 2025	Manju Bala Swati Sethi Sanjula Sharma Mridula D. Gurpreet Kaur Dhritiman Saha Nachiket Kotwaliwale
Continuous Plant for Protein Production	CF-202506082	02 June 2025	28 Aug 2025	Surya Tushir Manju Bala Sandeep Mann D.N. Yadav Nachiket Kotwaliwale



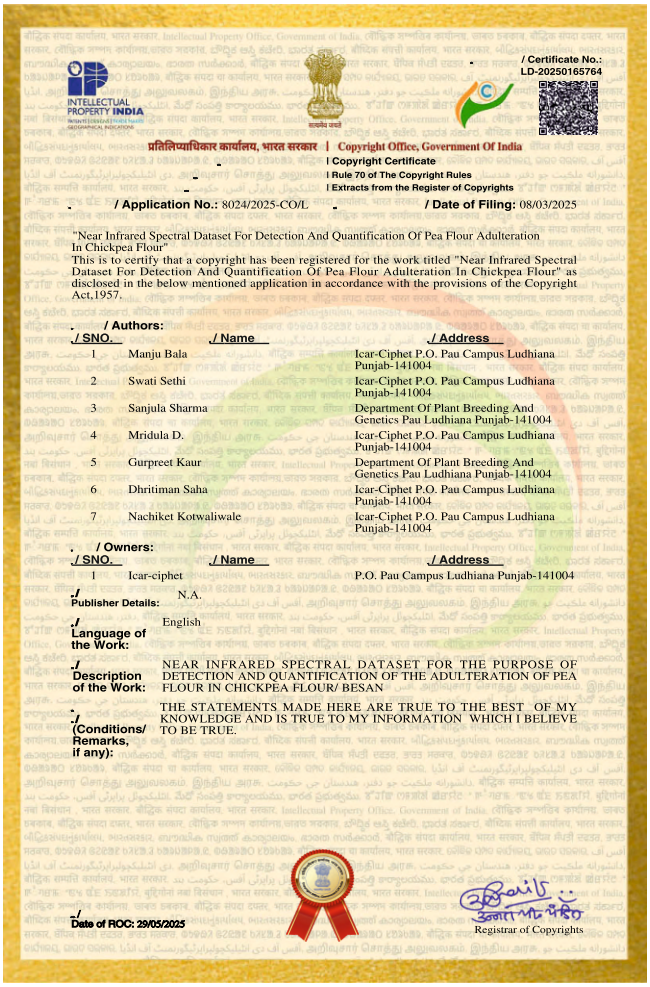
Extracts from the Register of Copyrights

प्रतिलिप्याधिकार कार्यालय, भारत सरकार | Copyright Office, Government Of India

/Dated:01/01/2025

1.	/Registration Number	L-159137/2025
2.	Name, address and nationality of the applicant	ICAR-CIPHET , P.O. PAU CAMPUS LUDHIANA, PUNJAB-141004 INDIAN PUNJAB AGRICULTURAL UNIVERSITY , PAU LUDHIANA-141004 INDIAN
3.	Nature of the applicant's interest in the copyright of the work	OWNER
4.	Class and description of the work	LITERARY/ DRAMATIC WORK NEAR INFRARED NIR SPECTRAL DATASET FOR THE PURPOSE OF DETECTION AND QUANTIFICATION OF THE ADULTERATION OF MAIZE FLOUR IN CHICKPEA FLOUR BESAN.
5.	Title of the work	NEAR INFRARED SPECTRAL DATASET FOR DETECTION AND QUANTIFICATION OF MAIZE FLOUR ADULTERATION IN CHICKPEA FLOUR
6.	Language of the work	ENGLISH
7.	Name, address and nationality of the author and if the author is deceased, date of his decease	MANJU BALA , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN SWATI SETHI , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN SANJULA SHARMA , DEPARTMENT OF PLANT BREEDING AND GENETICS, PAU LUDHIANA, PUNJAB-141004 INDIAN MRIDULA D. , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN GURPREET KAUR , DEPARTMENT OF PLANT BREEDING AND GENETICS, PAU LUDHIANA, PUNJAB-141004 INDIAN DHRITIMAN SAHA , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN NACHIKET KOTWALIWALE , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN
8.	Whether the work is published or unpublished	PUBLISHED
9.	Year and country of first publication and name, address and nationality of the publisher	2024 INDIA DIRECTOR, ICAR- CIPHET , ICAR-CIPHET, P.O. PAU CAMPUS, LUDHIANA, PUNJAB-141004 INDIAN
10.	Years and countries of subsequent publications, if any, and names, addresses and nationalities of the publishers	N.A.
11.	Names, addresses and nationalities of the owners of various rights comprising the copyright in the work and the extent of rights held by each, together with particulars of assignments and licences, if any	ICAR-CIPHET , P.O. PAU CAMPUS LUDHIANA, PUNJAB-141004 INDIAN
12.	Names, addresses and nationalities of other persons, if any, authorised to assign or licence of rights comprising the copyright	N.A.
13.	If the work is an 'Artistic work', the location of the original work, including name, address and nationality of the person in possession of the work, (In the case of an architectural work, the year of completion of the work should also be shown).	N.A.
14.	If the work is an 'Artistic work' which is used or capable of be used in relation to any goods or services, the application should include a certification from the Registrar of Trade Marks in terms of the provision to Sub-Section (i) of Section 45 of the Copyright Act, 1957.	N.A.

Registrar of Copyrights



/ Certificate No.: LD-20250165764

प्रतिलिप्याधिकार कार्यालय, भारत सरकार | Copyright Office, Government Of India

| Copyright Certificate
| Rule 70 of The Copyright Rules
| Extracts from the Register of Copyrights

/ Application No.: 8024/2025-CO/L / Date of Filing: 08/03/2025

"Near Infrared Spectral Dataset For Detection And Quantification Of Pea Flour Adulteration In Chickpea Flour"
This is to certify that a copyright has been registered for the work titled "Near Infrared Spectral Dataset For Detection And Quantification Of Pea Flour Adulteration In Chickpea Flour" as disclosed in the below mentioned application in accordance with the provisions of the Copyright Act,1957.

/ Authors:

/. SNO.	/. Name	/. Address
1	Manju Bala	Icar-Ciphet P.O. Pau Campus Ludhiana Punjab-141004
2	Swati Sethi	Icar-Ciphet P.O. Pau Campus Ludhiana Punjab-141004
3	Sanjula Sharma	Department Of Plant Breeding And Genetics Pau Ludhiana Punjab-141004
4	Mridula D.	Icar-Ciphet P.O. Pau Campus Ludhiana Punjab-141004
5	Gurpreet Kaur	Department Of Plant Breeding And Genetics Pau Ludhiana Punjab-141004
6	Dhritiman Saha	Icar-Ciphet P.O. Pau Campus Ludhiana Punjab-141004
7	Nachiket Kotwaliwale	Icar-Ciphet P.O. Pau Campus Ludhiana Punjab-141004

/ Owners:

/. SNO.	/. Name	/. Address
1	Icar-ciphet	P.O. Pau Campus Ludhiana Punjab-141004

/. Publisher Details: N.A.

/. Language of the Work: English

/. Description of the Work: NEAR INFRARED SPECTRAL DATASET FOR THE PURPOSE OF DETECTION AND QUANTIFICATION OF THE ADULTERATION OF PEA FLOUR IN CHICKPEA FLOUR/ BESAN

/. (Conditions/ Remarks, if any): THE STATEMENTS MADE HERE ARE TRUE TO THE BEST OF MY KNOWLEDGE AND IS TRUE TO MY INFORMATION WHICH I BELIEVE TO BE TRUE.

/. Date of ROC: 29/05/2025

Registrar of Copyrights

LINKAGES AND COLLABORATIONS

MoUs Signed

Universities/Institutions	Date of Signing
M/s. Beejapuri Fresh Products Private Limited, registered office at Unit No. 547 to 550, 5th Floor, JMD Megapolis, Sohna Road, Sector-48, Gurgaon, Haryana – 122018	11 Feb 2025
M/s. Veer Plastics Pvt. Ltd., Block No. 327, Santej Vadsar Road, Santej, Teh. Kalol, Distt. Gandhinagar, Gujarat – 382721.	12 Feb 2025
M/S Sampurn Agri Ventures Private Limited (SAVPL), Plot No. 178-178A, Industrial & Business Park, Industrial Area Phase – I, Chandigarh-160002	15 Feb 2025
Madhya Pradesh State Agricultural Marketing Board (MPSMB), Kisan Bhawan, 26, Arera Hiilles, Jail Road Bhopal (MP)	27 June 2025
M/s Steady Rootz, No. 5/486, Plot F1, Rukmani Enclave, Velappa, Naidu Compound, Nandhavanapatty, Dindigul, Tamil Nadu	15 July 2025
Sardar Vallabhbhai Patel University of Agriculture and Technology, (SVPUAT), Modipuram, Meerut, Uttar Pradesh	20 Nov 2025
Indira Gandhi Krishi Vishwavidyalaya (IGKV), Raipur, Chhattisgarh	21 Nov 2025
Tamil Nadu Food Processing and Agri Export Promotion Corporation(TNAPEx), Guindy, Chennai	07 Dec 2025

Post-Harvest Machinery & Equipment Testing Centre

The PHMETS tested 48 machines from 1 Jan - 31 Dec 2025, generating a total testing fee of around Rs. 1.05 Crore.

Time Period	January 1st, 2025, to December 31st, 2025
No. of applications received	48
No. of test reports issued	30
Total revenue generated	Rs 1,05,06,028/-

Draft Test codes submitted to BIS

i) Grain Analyser
ii) Arecanut Dehusker
iii) Cow Dung Dewatering Machine
iv) Juice Extraction Machine
v) Pulveriser
vi) Potato Peeler
vii) Potato/Banana Chips Making Machine
viii) Solar Dryer (Tunnel Type)

Machines tested at PHMETC from 1 January 2025 -31 December 2025

S. No	Name of machine	No. of machines tested
1.	Mini Oil Mill	7
2.	Paddy cleaner	5
3.	Apple grader	9
4.	Groundnut Destoner	3
5.	Groundnut Decorticator	1
6.	Solar dryer	2
7.	De-oiling and De-watering machine (For chips and finer chips)	1
8.	Dry masala grinder	1
9.	Indented Cylinder Grader	1
10.	Specific Gravity Separator	1
11.	Grain dryer	3
12.	Rice mill polisher	1
13.	Pulverizer	1
14.	Makhana popping machine	2
15.	Sugarcane Juicer	1
16.	Millet Mill	2
17.	Grain Analyser	2
18.	Mini Rice Mill (Tractor operated)	1
19.	Biochar Making Machine	1
20.	Coconut Shredder with two outputs – Coco Fibre and Coco Peat	1
21.	Hand Operated Finger Chips Making Machine	1
22.	Urea Briquetting Machine (Power Operated)	1
	Total	**48**

FOOD TESTING LABORATORY

The Ministry of Food Processing Industries (MoFPI), New Delhi, supports a Food Testing Laboratory equipped with basic and semi-advanced analytical facilities for food analysis and safety assessment. The laboratory is accredited under ISO/IEC 17025:2017 (Certificate No. TC-12253) and offers validated testing services for key parameters such as water quality, fat, protein, fibre, and mineral content. The facility caters to the analytical and quality assurance requirements of food processors, entrepreneurs, small and medium enterprises (SMEs), and industry stakeholders at reasonable charges.

During 2025, the laboratory handled a substantial number of commercial samples and generated Rs. 4.90 lakh through testing and training activities. The unannounced audit by the National Accreditation Board for Testing and Calibration Laboratories (NABL) was conducted on 28 January 2025.

HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING PROGRAMME

HRD PROGRAMME ATTENDED

Scientific Staff	Title of Programme	Organized by	Duration
Amit Nath	Training program on "Science and Technology: Global Development and Perspectives"	National Institute of Advanced Studies (NIAS), Bengaluru	15-19 Sept 2025
Leena Kumari	Introduction to Robotics	Electronics & ICT Academy, IIT Roorkee	09-20 Feb 2026
	AI-Enabled Computer Vision Systems for Advanced Food Quality Evaluation	Department of Food Process Engineering, National Institute of Technology, Rourkela, Odisha	14-18 July 2025
Guru P N	Winter school on "Climate Smart Maize Agriculture for Food and Energy Security in India"	ICAR-IIMR and ICAR-CIPHET, Ludhiana	05-25 March 2025
Sujata Sethi	Development of master trainers under Rashtriya Karmayogi Jan Seva Programe	ICAR-NDRI, Karnal	08-10 Dec 2025
	Development of Master Trainers under Rashtriya Karmayogi Jan Seva Programme – Phase II (Zone-IV)	ICAR-NDRI, Karnal	08-10 Dec 2025
Vikas Kumar	Laboratory Quality Management System & Internal Audit as per IS/ISO/IEC 17025:2017	NITS, Noida	17-20 Feb 2025
	Meta-Analysis under ICAR-NAARM	ICAR-NAARM, Hyderabad	08-12 Dec 2025
Shaghaf Kaukab	3-Days workshop on "Cultivating Intelligence: MATLAB for Agri-Innovation"	ICAR-NISA, Ranchi	05-07 Aug 2025
Thongam Sunita Devi	5 days training on "Testing and Evaluation of Farm Machinery/ Equipment"	NRFMTTI, Hisar	19-23 May 2025
	5-day online workshop on AI-enabled computer vision systems for advanced food quality evaluation organized	NIT, Rourkela	14-18 July 2025
	3-day workshop on Hands-on Workshop for Agri-Scientist "Cultivating Intelligence: MATLAB for Agri-Innovation"	ICAR-NISA, Ranchi, Jharkhand	05-07 Aug 2025
Soumya Mohapatra	Tools and Techniques for Advanced Analytics in Social Science Research	ICAR-IARI, AERA & IFPRI, New Delhi	07-18 July 2025
Ritu Kukde	21 days winter school on "Climate Smart Maize Agriculture for Food and Energy Security in India"	ICAR-IIMR and ICAR-CIPHET, Ludhiana	05-25 Mar 2025
	5-Day Online Workshop on "AI-Enabled Computer Vision Systems for Advanced Food Quality Evaluation"	Department of Food Process Engineering, National Institute of Technology Rourkela, Odisha	14-18 July 2025
	3-Days workshop on "Cultivating Intelligence: MATLAB for Agri-Innovation"	ICAR-NISA, Ranchi	05-07 Aug 2025

HRD PROGRAMME ORGANIZED

Training Title	Number of Participants	Duration
Entrepreneur Development Programme		
Processing and value addition of green chilli	02	10-12 Feb 2025
Hawaijar production using mechanized hawaijar maker	60	19-21 March 2025
Spices Processing	01	28 March 2025
EDP to Murti Foods	01	15 April 2025
Processing of Oilseeds for Edible Oil	01	26-28 Nov 2025
ATMA Sponsored Farmers Training/ Farmers Training		
Processing of Horticultural Crops	19	20-24 Jan 2024
Post-harvest Technologies of Agricultural Produce	27	27-31 Jan 2025
Post-harvest Technologies of Agricultural Produce	16	03-07 Feb 2025
Post-harvest Technologies of Agricultural Produce	27	10-14 Feb 2025
Post-harvest Technologies of Agricultural Produce	25	17-21 Feb 2025
Post-harvest Technologies of Agricultural Produce	29	24-28 Feb 2025
Post-harvest Technologies of Agricultural Produce	25	03-07 March 2025
कृषि प्रौद्योगिकी प्रबंध अभिकरण, नागपुर (महाराष्ट्र) द्वारा प्रायोजित "कृषि उत्पादों का फसलोत्तर प्रबंधन"	22	17-21 March 2025
SMART प्रकल्प, जलगाव, (महाराष्ट्र) द्वारा प्रायोजित "कृषि उत्पादों का फसलोत्तर प्रबंधन"	20	24-28 March 2025
Post-harvest Technologies of Agricultural Produce	25	03-07 March 2025
Post-Harvest Handling, Processing and Value Addition of Agricultural Commodities	01	18 Sept-03 Oct 2025
Students Training		
Student training for B.Sc (Hons.) Community Science student from Acharya Narendra Deva University of Agriculture and technology, Kumarganj, Ayodhya (U.P.)	01	01 Apr-15 May 2025
Student training for B.Tech (Agril. Engg.) students from of College of Agricultural Engineering and Technology, Dapoli– 415712. Dist: Ratnagiri (Maharashtra)	04	01-31 May 2025
Student training for B.Tech (Agril. Engg.) students from College of Agril. Engg and Technology, Vasantrao Naik Marathwada Krishi Vidhyapeeth, Prabhani-431402 (Maharashtra)	03	01-31 May 2025
Student training for B.Tech (Agril. Engg.) students from Mahatma Phule Krishi Vidhyapeeth, Rahuri, Krishi Visnyan Sankul, Kashti (Maharashtra)	05	01-31 May 2025
Student training for B.Tech (Agril. Engg.) students from Mahamaya College of Agricultural Engineering and Technology, Akbarpur Ambedkar Nagar (Uttar Pradesh)	07	01-30 June 2025
Student training for B.Tech (Agril. Engg.) students from College of Agricultural Engineering and technology, Godhra	07	01-30 June 2025

Student training for B.Tech (Agril. Engg.) students from College of Agricultural Engineering and Technology, Junagadh Agricultural University, Gujarat	05	01-30 June 2025
Student training for B.Tech (Agril. Engg.) students from ITM University, Gwalior	03	01-30 June 2025
Student training for B.Tech (Agril. Engg.) students from College of Agricultural Engineering and Technology Dediapada, NAU, Gujarat	07	01-30 June 2025
Student training for B.Tech (Food Tech.) students from Punjab Agricultural University, Ludhiana (Punjab)	02	30 June - 30 July 2025
Student training for B.Sc (Hons.) Nutrition and Dietetics student from Punjab Agricultural University, Ludhiana (Punjab)	01	01-31 July 2025
Student training for B.Tech (Agril. Engg.) students from College of Technology and Agriculture Engineering, Agriculture University, Jodhpur (Rajasthan)	07	01-31 July 2025
Student training for B.Tech (Agril. Engg.) students from College of Agricultural Engineering and Technology, CCS Haryana Agricultural University Hisar, (Haryana)	07	01-31 July 2025
Student training for B.Tech (Agril. Engg.) students from Uttar Banga Krishi Vishwavidyalya, Coochbehar, West Bengal	10	01-30 Aug 2025
Student training for B.Tech (Agril. Engg.) students from College of Technology and Engineering, MPUAT Udaipur, Rajasthan	03	01-30 Aug 2025
Student training for B.Tech (Agril. Engg.) students from College of Technology Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut-250110 (Uttar Pradesh)	10	04-30 Aug 2025
Student training for B.Tech (Agril. Engg.) students from ICAR-IARI, New Delhi-110012	10	01-30 Sept 2025
Student training for B.Tech (Agril. Engg.) student from College of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana (Punjab)	01	01-30 Sept 2025
Student training for B.Tech (Agril. Engg.) students from College of Agricultural Engineering, JNKVV, Jabalpur	03	01-30 Sept 2025

Agri Business Incubation (ABI)

The Institute's Agribusiness Incubation (ABI) Programme undertook a range of capacity-building and entrepreneurship development activities, including training programmes, business meetings, and awareness/sensitization initiatives, in addition to providing incubation support to startups. During 2025, the ABI Centre organized three sensitization programmes.

Sensitization Programs Organized

Title	Date	No. of Participants
Awareness cum training program for on soy/groundnut processing	8 Mar 2025	100 women of FPO members
Exploring Existing supportive Schemes of MSME and future Possibilities with hand holding of Banking Sector in the Agriculture and Food Processing Machinery Sector"	10 Mar 2025	50
Sensitization cum awareness and training program on “Agribusiness and Entrepreneurship Development through bakery	26 Mar 2025	30 women participants

Incubation Provided

Title	Contracting Party	Duration
Wheat processing	Ms. Amanpreet Kaur Luthra, Ludhiana	Jan 2025
Food grain processing	Mr. Ajayveer Singh	Feb 2025
Food grain processing	Ms. Deepika Goyal	Feb 2025
Fruits and vegetable processing/Packaging & labeling	Sh. Nareh Kumar (M/s Moon Grow)	Feb 2025
Dry fruits processing	Dr. Sajjad Ul Akbar Wani, M/s Kasmir Agro Exporters, Jammu & Kashmir	Mar 2025
Continuous plant for protein production under ABI	M/s Prakrutisaar Pvt. Ltd., Maharashtra	June 2025
Makhana pilot plant at NRCM Darbhanga for makhana processing	Mr. Vaibhav Batra, Ludhiana	June 2025
Spice processing	Harijit Kumar, Faridkot	July 2025
Terra drops india pvt ltd., Jhajjar, Haryana	Processing of oilseeds	Dec 2025

Extension Activities

Monitoring of honey processing units established under the Farmer FIRST Project (FFP)

The ICAR–CIPHET, Ludhiana team under the Farmer FIRST Project (FFP) conducted timely monitoring of honey processing units established at Rahon, Sangrur o 11 September 2025 to evaluate their performance, functioning, and adoption of beekeeping and honey processing technologies by beneficiary farmers. During the visits, the team interacted with farmers to discuss beekeeping practices, honey processing and packaging methods, and migration practices adopted to improve honey yield. Discussions were also held on marketing strategies for processed honey, including local marketing channels, branding, and consumer demand. The team collected annual honey production data and assessed various aspects of the honey enterprise such as cost economics, quality evaluation of processed honey, and the scientific reasons behind honey crystallization. Farmers were further guided on maintaining product quality, improving packaging, and enhancing the market value of honey. In addition, farmers shared their experiences and challenges related to honey production, processing, marketing, and market demand, which helped the team identify practical constraints and provide technical guidance to improve the sustainability and profitability of the honey processing units established under the Farmer FIRST Project.

Production of chemical free candy shaped jaggery through silicon moulds

The ICAR–CIPHET, Ludhiana team under the Farmer FIRST Project (FFP) carried out timely monitoring of the jaggery processing units established at Rahon on 09 January 2026. During the visit, the team interacted with farmer S. Sohan Singh Uppal and Mr. Gurpal Singh to discuss upcoming strategies for improving the production of solid and granular jaggery as well as strengthening marketing aspects of jaggery and its value-added products. Data regarding the progress of jaggery and jaggery candy production was also collected to evaluate the performance and development of the processing unit.

In addition, the team visited Chunni Kalan, District Fatehgarh Sahib, Punjab on 07.01.2026 where interactions were held with several farmers engaged in jaggery production. Various roadside jaggery processing units located along the Chunni–Chandigarh Road were also visited. The facilities, equipment, and ongoing processing operations were carefully examined to assess their processing capacity, cost of production, and existing marketing linkages. The monitoring visit provided an opportunity to understand the current status of jaggery processing in the region and to guide farmers on improving processing efficiency, value addition, and market opportunities.

Sh. Gurwinder singh (farmer) from Rahon, Punjab is processing sugarcane into solid and granular jaggery by traditional practices from 2 years. He was producing solid jaggery into big round and cubical blocks as per conventional methods. During the visit of project staff, he came to know about the modern jaggery production technology with 3 pan furnace heating system. The team also gave insights on production of chemical free cubical and candy shaped jaggery under hygienic conditions for better market sales. The farmer showed keen interest in production on small candy shaped jaggery and FFP, ICAR-CIPHET provided silicon moulds of different shapes and sizes to him during visit on 30.01.2026. Project team also provided training on hygienic production of chemical free jaggery through these moulds.

ICAR-CIPHET-IIFA and Kisan Mela 2025

The Central Institute of Post-Harvest Engineering and Technology (CIPHET) inaugurated CIPHET-IIFA 2025 industry interface fair on agro-processing on its 36th foundation day celebrations. The event was attended by SN Jha, Deputy Director General (Agricultural Engineering) and Dr. Narsaiah Kairam, Assistant Director General (Process Engineering), ICAR. The event attracted a diverse range of stakeholders including farmers, entrepreneurs, industrial representatives, researchers, students, and policymakers. The major primary goal of IIFA is to create a bridge between laboratory research and

commercial application, enabling the dissemination and adoption of post-harvest and value-addition technologies developed by ICAR institutes and other research organizations across the country.

Participation in Exhibitions

Programme Title	Venue	Duration
Pusa Krishi Vigyan Mela 2025	Kisan Mela Ground, ICAR–IARI, New Delhi.	22-24 Feb 2025
PAU Kisan Mela 2025	Punjab Agricultural University, Ludhiana	21-22 March 2025
Technology Mela- 2025, Central Agricultural University, Imphal	CAU-NEC Model Farm, Central Agricultural University, Imphal	22-23 March 2025
Exhibition under “National Campaign of Viksit Krishi Sankalp Abhiyan”	Krishi Vigyan Kendra, Patiala	05 June 2025
PAU Kisan Mela 2025	Punjab Agricultural University, Ludhiana	26-27 Sept 2025
Science-Technology-Defence-Space Exhibition organized by Ministry of Earth Sciences(MoES), GOI	Dusshera Ground, Sector 5, Panchkula	06-09 Dec 2025

SCHEDULE CASTE SUB PLAN (SCSP)

The ICAR–CIPHET Scheduled Caste Sub Plan (SCSP) scheme is implemented with the objective of enhancing the socio-economic status of the Scheduled Caste (SC) community through targeted training and capacity-building programmes. The scheme focuses on agricultural produce processing, with special emphasis on empowering SC farmers, farm women, and rural youth by improving their skills, knowledge, and livelihood opportunities.

Title of Training/Program/Activities carried out under SCSP	Location	No. of Participants	Duration
Processing storage & value addition of food grains	Village Khanpur, Distt. Ludhiana	54	05 - 07 Aug 2025
Skill Development Training on Cereals, Spices and Honey Processing under SCSP Scheme (Govt. of India)	ICAR-CIPHET, Ludhiana	50	30 Sept - 04 Oct 2025
Post-Harvest Management and Value Addition of Maize under SCSP Scheme (Govt. of India)	ICAR-CIPHET, Ludhiana	50	04 - 07 Oct 2025
Processing and value addition of peanuts under SCSP Scheme (Govt. of India)	ICAR-CIPHET, Ludhiana	62	23 Dec 2025

VISITORS

Officials

Designation/Address of Visitors	Number of visitors	Date
Sri Konda Laxman Telangana State Horticultural University (SKLTSHU), Telengana	03	05 March 2025
Dr. Kamaljit Singh Sandhu, Head, Department of Food Science and Technology, MRSPTU, Bathinda	01	22 April 2025
Mr. Manish Sisodia, Chief Secretary Punjab and their team	04	18 May 2025
Ms. Charinjivi Sahu, ICICI Foundation	01	19 May 2025
Sh. A.K Rathod, New Darpan Colony, Gwalior (M.P.)	01	26 May 2025
Visit of officials of Central warehousing Corporation	32	10 Oct 2025
Sh. Bhagirath Chaudhary, Hon'ble Minister of State for Agriculture & Farmers Welfare and their team	05	14 Oct 2025
Mr. Cees Shoenmakers, PUM Senior Expert, Neitherlands	01	08-16 Nov 2025
Exposure visit by trainee faculty of IGMRI, Ludhiana	22	25 Nov 2025

Farmers

Farmer's Group	Number of visitors	Date
Village Gunopur, Tehsil, Distt. Gurdaspur	2	06 May 2025
Sh. Amrinder Singh, Fatehgarh Sahib	4	16 June 2025
Entrepreneurs from village Kishangarh and Dharamgarh	2	24 Oct 2025
Exposure visit by farmers, ATMA, Baran, Rajasthan	53	25 Nov 2025

Student's Educational Visits

Address of Visitors	Number of visitors	Date
College of Horticulture and Forestry, Pashighat, Arunachal Pradesh, Central Agricultural University	31	03 Feb 2025
College of Agriculture, Junagadh Agricultural University	50	07 Feb 2025
Sri Karan Narendra Agriculture University	62	12 Feb 2025
College of Horticultural Engineering & Food Technology (DSLD CHEFT), Devihosur, UHS, Bagalkot	24	25 Feb 2025
College of Agriculture, Peethampuri, Neem ka Thana, Sikar, SKNAU, Jobner	33	04 March 2025
Institute of Food Technology, Bundelkhand University, Jhansi, UP	50	05 March 2025
NIFTEM, Thanjavur, Tamil Nadu	65	12 March 2025
Guru nanak Girls College, Model Town, Ludhiana, Punjab	50	18 Apr 2025
Kalasalingam University, Tamil Nadu	32	21 April 2025
College of Fishieries, GADVASU, Ludhiana	20	13 May 2025
Students visit from Junagarh Agricultural University, Gujarat	27	02 June 2025
Ryan International School	61	06 Nov 2025
Exposure visit by students from lovely professional University, Phagwara, Jalandhar	58	18 Nov 2025
Exposure visit by students from PAU, Ludhiana	56	20 Nov 2025

Events Organized

Republic Day Celebration

ICAR-CIPHET observed the 75th Republic Day of India on January 26, 2025, commemorating the adoption of the Constitution of India. The celebrations commenced with the ceremonial hoisting of the National Flag by the Director, ICAR-CIPHET, Dr. Nachiket Kotwaliwale, followed by his address highlighting the significance of the occasion and the values enshrined in the Constitution. The programme also included cultural and sporting activities with the active participation of institute staff and their family members, fostering a spirit of unity, national pride, and community engagement. The observance provided an opportunity for the ICAR-CIPHET fraternity to collectively celebrate the nation's democratic ethos.

International Yoga Day

ICAR-CIPHET, Ludhiana, along with its Abohar station, ICAR-ATARI Zone-1 Ludhiana, ICAR-NRC on Makhana, Darbhanga and Yog Bharti, Ludhiana jointly observed International Yoga Day 2024 on June 21st. The event was held in a hybrid format with approximately 110 participants attending in person including scientific, administrative, technical and support staff, students and other citizens from the three institutes. Around 20 more participants from the ICAR-CIPHET Regional Station, ICAR-NRC on Makhana, and other locations joined the program online.

Independence Day

ICAR-CIPHET celebrated the 78th Independence Day of India on August 15, 2025, at its Ludhiana and Abohar campuses. At the Ludhiana campus, the celebrations commenced with the hoisting of the National Flag by the Director, Dr. Nachiket Kotwaliwale, followed by his address to the staff. In his address, the Director highlighted the key achievements of the institute during the preceding year, acknowledged the collective efforts of the staff, and emphasized the vital role of post-harvest management in enhancing food security and minimizing losses. He also stressed the importance of maintaining a clean, healthy, and hygienic work environment for staff well-being and institutional efficiency. The observance reaffirmed ICAR-CIPHET's commitment to national development and scientific advancement in the agricultural sector.

Vigilance Awareness Week

Vigilance Awareness Week was observed from 27 October to 2 November 2025 at ICAR–Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana and its Regional Station, Abohar, on the theme *"Vigilance: Our Shared Responsibility."* The observance commenced with a pledge-taking ceremony on 27.10.2025, led by Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET, Ludhiana, in the presence of Heads of Divisions, Senior Administrative Officer, Administrative Officer, Finance & Accounts Officer, and all scientific, technical, and administrative staff. Vigilance Awareness Week banners were displayed prominently at both campuses. All employees also took the online e-pledge through the Central Vigilance Commission (CVC) website, with the Senior Administrative Officer administering the pledge on behalf of the Institute. As part of outreach activities, a workshop was organized on 30.10.2025 for students of Govt. Girls Senior Secondary Smart School, Abohar, by Dr. Ramesh Kumar, Principal Scientist, R.S. Abohar, and Dr. Rupinder Kaur, SMS (Home Science), KVK, ICAR-CIPHET, Abohar. A total of 237 students participated and were sensitized on vigilance and anti-corruption measures. On 31.10.2025, Slogan and Poster Competitions were organized at Ludhiana campus, witnessing enthusiastic participation from employees. A capacity building training on "Investigation, Report Writing, and Framing of Charge Sheets" was also conducted by Sh. Lovepreet Singh, DSP (Vigilance), Punjab Police. Additionally, employees completed online training modules on the iGOT Karmayogi portal related to vigilance and work ethics. The activities were coordinated by Dr. Manju Bala, Vigilance Officer, along with members of the Vigilance Team. Further, a Vigilance Awareness Campaign was carried out from 18 August to 17 November 2025, during which all prescribed activities were successfully completed.

Rashtriya Ekta Diwas

Rashtriya Ekta Diwas 2025 was celebrated on 31 October 2025 at ICAR–CIPHET, Ludhiana; R.S. Abohar; and ICAR–KVK, Fazilka to commemorate the 150th birth anniversary of Sardar Vallabhbhai Patel, the Iron Man of India. A series of activities were organized to mark the occasion, including the administration of the Rashtriya Ekta Diwas Pledge to all staff members, a “Walk for Unity” to promote national integration and collective strength, and the display of banners and posters depicting the life, vision, and contributions of Sardar Vallabhbhai Patel. A short video on the theme “Ek Bharat, Shreshtha Bharat” was also screened, along with organization of awareness activities for the students.

Event Organized on Exploring MSME Support Schemes and Future Opportunities in Agriculture and Food Processing Machinery Sector

The one-day program aims to explore existing MSME support schemes and examine future opportunities arising from banking sector land holdings, with special emphasis on the agriculture and food processing machinery sector.The event focused on an insightful discussion on the existing supportive schemes for Micro, Small, and Medium Enterprises (MSMEs) and explored future opportunities within the agriculture and food processing machinery sector. It delved into how the collaboration of banking sectors with these enterprises could play a key role in driving growth and development of these industries.

Celebration of "World Intellectual Property Day" at ICAR-CIPHET Ludhiana

The "World Intellectual Property Day" was celebrated at ICAR – CIPHET Ludhiana with the theme of IP and Music: Feel the Beat of IP on 02 May 2025 in virtual mode. This event was celebrated through Institute Management Unit (ITMU) and Agri Business Incubation Centre (ABIC) by conducting awareness program on Intellectual Property Rights. Dr. Ranjeet Singh, Head, transfer of technology division, ICAR-CIPHET, Ludhiana greeted the guest speaker Advocate Swapnil Sanap, CEO and Founder, IP Shastra, Pune and welcomed all the participants for World Intellectual Property Day celebration. Advocate Sanap delivered lecture on "Unlocking Innovation: Identifying the Right IPR for Your Ideas and Exploring Government Benefits". He provided an insightful overview of the different categories of intellectual property and their practical applications along with various government schemes and incentives that support innovators, researchers, and entrepreneurs in protecting and commercializing their ideas. Dr. Nachiket Kotwaliwale, Director highlighted the growing relevance of IPR in research, innovation, and societal development. Dr. Ranjeet Singh delivered the vote of thanks, expressing gratitude to the speaker and participants for making the event meaningful and impactful. The event successfully reinforced the importance of IPR in protecting and promoting innovation and creativity.

Viksit Krishi Sankalp Abhiyan (VKSA) Programme

Addressing the critical challenge of limited technology adoption and the "Lab-to-Land" knowledge gap, the nationwide Viksit Krishi Sankalp Abhiyan (VKSA) was launched from 29 May to 12 June, 2025 by the Ministry of Agriculture and Farmers' Welfare to foster a transformative, two-way learning ecosystem between the scientific fraternity and the farming community. Recognizing that inadequate outreach and restricted access to institutional support often hinder agricultural progress, scientists from ICAR-CIPHET, Ludhiana, strategically implemented this campaign across twenty three districts in Punjab, including Ropar, Ludhiana, Malerkotla, SBS Nagar, Fatehgarh Sahib, Moga, and Barnala etc. The initiative was meticulously designed to disseminate season-specific advisories and mobilize experts to document grassroots insights, ensuring that agricultural research remains responsive to local-level needs and socio-economic constraints. During the campaign, comprehensive sessions were conducted on Kharif and Rabi crop planning, highlighting the promotion of improved varieties and water-saving technologies like Direct Seeded Rice (DSR). To enhance farmers' income and sustainability, the teams provided intensive training on value addition, agro-processing, and post-harvest mechanization—specifically showcasing the PAU mobile dryer and CIPHET's technological interventions. Farmers were further sensitized to emerging modern practices, including drone applications, crop residue management, soil health card benefits, and the potential of voluntary carbon markets. Special emphasis was placed on diversifying income through specialty corn cultivation, livestock fodder solutions like hydroponics, and the establishment of custom hiring centers for smallholders. By integrating information on government schemes such as PM-Kisan and RKVY with technical demonstrations and the distribution of bilingual information booklets, VKSA 2025 successfully bridged the communication divide. This collaborative outreach effort not only empowered farmers with modern tools and resilient practices against climate change but also established a robust feedback loop for future institutional research and inclusive agricultural development.

Crop Residue Management (CRM) Awareness Programme

The Crop Residue Management (CRM) awareness campaign, conducted from October 31 to November 15, 2025, was an intensive outreach initiative to sensitize farmers, students, and key stakeholders to the environmental, health, and agronomic hazards of stubble burning while promoting sustainable, practical, and economically viable alternatives. Spearheaded through a collaborative effort by ICAR-Indian Institute of Maize Research, ICAR-Central Institute of Post-Harvest Engineering and Technology, and Krishi Vigyan Kendras, the campaign achieved extensive grassroots outreach across 23 districts of Punjab by integrating scientific expertise with local extension networks. The strategy adopted a multi-dimensional approach combining village-level awareness camps, district-level demonstrations, and institutional engagement to ensure both immediate behavioral change among farmers and long-term attitudinal shifts among rural youth. More than 20 structured programs were conducted in collaboration with KVKs and educational institutions, collectively reaching over 1,200 participants through a mix of lectures, field demonstrations, group discussions, and participatory activities that emphasized hands-on learning and problem-solving. A central focus of the campaign was the demonstration and promotion of in-situ crop residue management technologies, where advanced machinery such as Happy Seeder, Super Seeder, Smart Seeder, Straw Management System (SMS), and Mulcher were showcased in real field conditions to illustrate their role in managing paddy straw efficiently while enabling timely wheat sowing without residue burning. Simultaneously, ex-situ utilization pathways were highlighted to create value-added opportunities from crop residues, including composting, straw baling for industrial use, mushroom cultivation, preparation of animal feed, and bioenergy production, along with innovative applications like biodegradable packaging materials developed using mushroom mycelium by CIPHET. The campaign also placed strong emphasis on crop diversification, particularly encouraging the adoption of maize as a sustainable alternative to paddy, citing its benefits in improving soil structure, reducing groundwater depletion, lowering input costs, and minimizing residue management challenges. At the educational level, active engagement with institutions such as Chandigarh University, Khalsa University, and Guru Nanak Dev University helped extend the campaign's reach to students, who participated enthusiastically in competitions like slogan writing, poster making, speeches, and skits, thereby fostering their role as “youth ambassadors” advocating clean and sustainable agricultural practices within their communities. The overall response to the campaign was highly encouraging, with strong participation from farmers, educators, and students, reflecting increased awareness, improved understanding of CRM technologies, and a growing collective commitment to reducing stubble burning and transitioning toward environmentally responsible and climate-resilient farming systems in Punjab.

Annual Workshop of the AICRP on PEASEM

The XXI Annual Workshop of the AICRP on PEASEM was held at ICAR-VPKAS, Almora, from 30 October to 1 November 2025. Dr. S. N. Jha, DDG (Agricultural Engineering), was Chairperson; Dr. K. Narsaiah, ADG (PE), ICAR, New Delhi; Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET, Ludhiana; and Dr. Lakshmi Kant, Director, ICAR-VPKAS Almora, as Co-chairpersons, along with expert members: Dr. TBS Rajput, Former Project Director, Water Technology Centre, ICAR-IARI, New Delhi; Dr. Shadanan Patel, former Professor and Head, Dept. of APFE, IGKV, Raipur; and Er. Anand Zambre, Senior Vice President, Reliance Industries Ltd, Mumbai. During the workshop, progress reports and new technical programmes from all 14 AICRP on PEASEM centers were presented and discussed.

Annual Workshop of the AICRP on PHET

The 41st Workshop of AICRP on Post-Harvest Engineering and Technology (PHET) was held during 24–26 February 2026 at GITAM University, Visakhapatnam. The workshop commenced with an inaugural session on 24 February 2026 at the KRC Auditorium with the Vice-Chancellor of ANGRAU, Lam, Guntur as the Chief Guest. The session was chaired by Dr. S. N. Jha, DDG (Agricultural Engineering), ICAR, in the presence of senior officials from ICAR and State Agricultural Universities. Dr. R. K. Vishwakarma, Project Coordinator, AICRP on PHET, ICAR–CIPHET, Ludhiana, presented the coordinator's report, highlighting the progress and achievements of the programme. Dr. Nachiket Kotwaliwale, Director, ICAR–CIPHET, Ludhiana, also addressed the gathering and emphasized the importance of post-harvest engineering interventions for reducing losses and enhancing value addition.

SWACHH BHARAT ABHIYAN

In 2025, ICAR-CIPHET, Ludhiana organized various activities under the Swachh Bharat Abhiyan under the council's directives. During Swachhta hi Sewa Pakhwada (Sept 15-October 2) activities like swachhata pledge, awareness and sensitization programme on plastic pollution, Swachhta hi Seva campaign at Schools and Anganwadi centers, promotion of ecofriendly and zero waste practices through human chain, posters and practical demonstration, swachhta drive at Godham and Goushala, promoting creative initiatives in waste management integrating Swachhta with art, murals and culture in village and school level, awareness programmes for sanitation worker on Social Welfare Linkages, access to Health Facilities and Services, distribution of PPE kits and safety gear to advocate hygiene, safety and occupational hazards and felicitations of Safai mitras for their invaluable contributions.

The Swachhta Pakhwada (December 16-31) featured a pleadge ceremony on 16 December 2025 with diverse activities in the subsequent days to uphold cleanliness. These initiatives included cleanliness drive, Swachhta awareness campaigns, weeding out of old files, digitalization of office documents, green drives like plantation and green waste collection for composting, contributing to organic manure creation, community outreach with shraamdaan and community involvement, celebration of KISAN DIWAS (Farmer's Day), fostering healthy competition though quiz competition, signature campaign for swachhta awareness, recycling of waste water campaign, cleaning of public places with massive community mobilization for waste management, plogging events, organization of press conference at ICAR-CIPHET, Abohar campus with relevant stakeholders, including farmers, institute scientists, sanitation staff, and representatives of print and electronic media encouraging collective dedication and enthusiastic engagement for cleanliness and responsible waste management within and beyond the institute.

हिन्दी पखवाड़ा/कार्यशाला

भाकृअनुप–सीफेट, लुधियाना में राजभाषा हिन्दी पखवाड़ा (14 से 28 सितम्बर 2025)

प्रत्येक वर्ष की भांति, संस्थान में इस वर्ष दिनांक 14 से 28 सितम्बर 2025 तक राजभाषा हिन्दी पखवाड़ा मनाया गया। समारोह का उद्घाटन दिनांक 12 सितम्बर 2025 को डॉ. नचिकेत कोतवालीवाले, माननीय निदेशक, भा.कृ.अनु.प.–सीफेट, लुधियाना के कर कमलों द्वारा किया गया। इस अवसर पर वैज्ञानिक एवं स्टाफ सदस्यों को सम्बोधित करते हुए उन्होने हिन्दी के प्रचार–प्रसार के लिए दिनचर्या में सरल शब्दों के प्रयोग पर ज़ोर दिया। उन्होंने भा.कृ.अनु.प.–सीफेट, लुधियाना में वैज्ञानिक एवं प्रशासनिक कार्यो में हो रहे हिन्दी के उपयोग की सराहना की एवं प्रतियोगिताओं में बढ़–चढ़ कर भाग लेने का आह्वान किया। उन्होने संस्थान के समस्त वैज्ञानिकों से अनुरोध किया कि वे अपने शोध–पत्रों को हिन्दी भाषा में प्रकाशित करने पर ज़ोर दें। डॉ. महर्षि तोमर, वरिष्ठ वैज्ञानिक ने उद्घाटन समारोह का संचालन किया। इस अवसर पर संस्थान की हिन्दी पखवाड़ा समिति के सदस्य श्रीमती अनुराधा ने पखवाडे के दौरान 15 दिनों तक चलने वाली विभिन्न प्रतियोगिताओं एवं कार्यक्रमों की रूपरेखा बताई। हिन्दी पखवाड़ा के दौरान 11 अलग–अलग प्रतियोगिताएँ जैसे कंप्यूटर पर हिन्दी टाइपिंग, पोस्टर प्रतियोगिता, हिन्दी अनुवाद प्रतियोगिता, हिन्दी निबंध प्रतियोगिता, हिन्दी टिप्पणी एवं प्रारूप लेखन, हिन्दी टिप्पणी एवं प्रारूप लेखन, हिन्दी काव्य पाठ, तत्काल भाषण प्रतियोगिता, विज्ञान संबंधी शोध पत्र एवं चित्र देखकर कहानी लिखो विभिन्न संयोजकों एवं सह–संयोजकों के सहयोग से करवाई गई, जिनमे 3 प्रतियोगिताएं भाकृअनुप–सीफेट लुधियाना एवं अबोहर में अलग–अलग आयोजित की गई, जैसे कंप्यूटर पर हिन्दी टाइपिंग, पोस्टर प्रतियोगिता, हिन्दी अनुवाद प्रतियोगिता आयोजित की गई एवं 08 प्रतियोगिताएं संयुक्त रूप से आयोजित कि गई। इसमें कुछ प्रतियोगिताएं सभी वर्गो के अधिकारीयों एवं कर्मचारियों के लिए थी एवं कुछ प्रतियोगिताएं वर्ग विशेष अधिकारीयों एवं कर्मचारियों के लिए थी। राजभाषा हिन्दी पखवाडा के अन्तर्गत आयोजित सभी प्रतियोगिताओं में संस्थान के सभी अधिकारियों एवं कर्मचारियों ने बढ़–चढ़कर हिस्सा लिया। दिनांक 29.09.2025 को डॉ. नचिकेत कोतवालीवाले, निदेशक, सीफेट, लुधियाना एवं मुख्य अतिथि श्री जागीर सिंह, हवाई अड्डा निदेशक, भारतीय विमानपत्तन प्राधिकरण, लुधियाना हवाई अड्डा द्वारा प्रतियोगिताओं के विजेताओं को पुरस्कार प्रदान किये गये। इसके अतिरिक्त संस्थान में हिन्दी में किये गये कार्यों का मूल्यांकन कर संस्थान के कर्मचारियों को भी पुरस्कृत किया गया एवं अधिक से अधिक हिन्दी में कार्य करने के लिए सभी को प्रोत्साहित किया गया। निदेशक महोदय ने व्यक्त किया की हिंदी पखवाड़े को त्योहार के रूप में मनाने से हिंदी सशक्त एवं साम्थ्यर्वान होगी। राजभाषा हिंदी पखवाड़ा के सदस्य डॉ. विकास कुमार ने हिंदी पखवाड़ा का सफल आयोजन किया एवं सुश्री मुस्कान, प्रसहायक ने समापन समारोह का समन्वयन किया। राजभाषा हिंदी पखवाड़ा समिति–2025 के सदस्य डॉ. महर्षि तोमर, वरिष्ठ वैज्ञानिक डॉ. विकास कुमार, वैज्ञानिक डॉ. शिल्पा सेल्वन, वैज्ञानिक डॉ. किशन कुमार पटेल, एस.एम.एस. श्री डालू राम, तकनीकी अधिकारी, श्री प्रदीप कुल्हारी, सहा. वित् एवं लेखा अधिकारी, श्री सुघर सिंह वर्मा, निजी सहायक, श्री अजय कुमार, वरि. लिपिक एवं सुश्री अनुराधा ने कार्यक्रम के आयोजन में महत्वपूर्ण योगदान दिया।

भा.कृ.अनु.प.–सीफेट में वर्ष 2025 के दौरान राजभाषा हिंदी की तिमाही कार्यशालाओं का सफलतापूर्वक आयोजन किया गया। प्रथम तिमाही (जनवरी–मार्च) के अंतर्गत 21.03.2025 को अपराह्न 2:30 से 5:30 बजे तक आयोजित कार्यशाला में 'कर्मयोगी भारत एवं राजभाषा हिंदी संबंधी कोर्स' तथा 'हिंदी भाषा ज्ञान आकलन' विषयों पर डॉ. गुरु पी. एन., डॉ. शौम्य महापात्र एवं डॉ. पंकज कुमार द्वारा महत्वपूर्ण विचार प्रस्तुत किए गए। द्वितीय तिमाही (अप्रैल–जून) में 29.05.2025 को आयोजित कार्यशाला में मुख्य वक्ता श्री प्रयाग शुक्ल ने 'आज की दुनिया में राजभाषा हिंदी' विषय पर हिंदी की वर्तमान स्थिति, उसकी सामाजिक–सांस्कृतिक भूमिका तथा साहित्य, रंगमंच एवं सिनेमा में उसके योगदान पर प्रकाश डाला, जिसमें भा.कृ.अनु.प.–सीफेट के अतिरिक्त भा.कृ.अनु.प.–मक्का अनुसंधान संस्थान, लुधियाना एवं भा.कृ.अनु.प. अटारी, लुधियाना के अधिकारी भी उपस्थित रहे। तृतीय तिमाही (जुलाई–सितम्बर) में 08.08.2025 (शुक्रवार) को अपराह्न 2:30 से 5:30 बजे तक सभागार–1 में आयोजित कार्यशाला में प्रतिष्ठित कवयित्री एवं कथाकार डॉ. विभा कुमरिया शर्मा ने 'हिंदी की नियतिः राजभाषा होकर भी पराई' विषय पर व्याख्यान दिया। चतुर्थ तिमाही (अक्टूबर–दिसम्बर) में 19.12.2025 (शुक्रवार) को अपराह्न 2:30 से 5:30 बजे तक सभागार–1 में आयोजित कार्यशाला में डॉ. अनीश गर्ग ने 'हिंदी–संवेदना, संस्कार और संवाद की

भाषा' विषय पर अपने विचार प्रस्तुत किए। इन सभी कार्यशालाओं का संयोजन डॉ. विकास कुमार, वैज्ञानिक एवं प्रभारी, राजभाषा प्रकोष्ठ द्वारा किया गया तथा संस्थान के अधिकारियों एवं कर्मचारियों ने उत्साहपूर्वक भाग लेकर कार्यक्रमों को सफल बनाया।

वर्ष 2025 के दौरान सीफेट में आयोजित राजभाषा हिंदी की तिमाही कार्यशालाओं का विवरण

तिमाही (आयोजन तिथि)	विषय वस्तु	आमंत्रित वक्ता
जनवरी–मार्च 2025 (21.03.2025)	कर्मयोगी भारत एवं राजभाषा हिंदी संबंधी कोर्स हिंदी भाषा ज्ञान आकलन	डॉ. गुरु पी एन, डॉ. शौम्य महापात्रा, डॉ. पंकज कुमार
अप्रैल–जून 2025 (29.05.2025)	आज की दुनिया में राजभाषा हिंदी	श्री प्रयाग शुक्ल
जुलाई–सितम्बर 2025 (08.08.2025)	हिंदी की नियतिः राजभाषा होकर भी पराई	डॉ. विभा कुमरिया शर्मा
अक्तूबर–दिसम्बर 2025 (19.12.2025)	हिंदीः संवेदना, संस्कार और संवाद की भाषा	डॉ. अनीश गर्ग

Krishi Vigyan Kendra (KVK), Fazilka, Punjab

Established in the year 2016 under the aegis of the ICAR–Central Institute of Post-Harvest Engineering and Technology (ICAR-CIPHET), Krishi Vigyan Kendra (KVK), Fazilka has been functioning as a vital extension and capacity-building hub for the farming community across five designated blocks of the district. During 2025, KVK Fazilka, conducted extensive extension and capacity-building activities across the district. KVK Fazilka ensured strict compliance with all action points and directives issued by ICAR–ATARI. More than 7,000 farmers were successfully registered under the Kisan SARATHI platform during 2024-25, thereby expanding the digital advisory reach. Quality seed and planting material production was initiated following breeder seed norms and standard protocols. The One Village–One Technology initiative was implemented in Kera Kheda village to achieve complete technological saturation.

Agricultural Challenges and Strategic Interventions

KVK Fazilka addressed major agricultural challenges through integrated and location-specific strategies. Water scarcity was managed through the promotion of alternate wetting and drying (AWD), drip and sprinkler irrigation systems, and rainwater harvesting techniques. Soil degradation issues were tackled by advocating organic farming, crop rotation, conservation tillage, and balanced nutrient management. Climate change impacts were mitigated by promoting climate-resilient varieties, crop diversification, and timely weather-based advisories. Integrated Pest Management (IPM), early warning systems, and farmer education were emphasized to control pest and disease outbreaks. Infrastructure-related gaps were addressed through promotion of custom hiring centers, storage solutions, and cold chain management, while technology adoption was enhanced through frontline demonstrations, on-farm trials, and public–private partnerships.

Extension, Training, and Capacity Building Activities

During 2024–25, KVK Fazilka conducted extensive extension and capacity-building activities across the district. A total of one on-farm trial, ten frontline demonstrations, and one cluster frontline demonstration were implemented. Benefited 2,204 farmers 48 training programs conducted on different aspects, while three trainings were organized for extension personnel covering 81 participants. More than 4,800 farmers participated in various extension activities, exhibitions, and awareness programs. The KVK also produced 458 quintals of quality seed and distributed 3,000 planting materials to farmers. Soil testing services were provided for over 100 samples, and extensive media coverage was achieved through more than 100 press releases and regular social media engagement.

Flagship Programmes and National Campaigns

KVK Fazilka actively participated in flagship programmes and national-level campaigns during the reporting year. Under the Viksit Krishi Sankalp Abhiyan conducted from 29 May to 15 June 2025, more than 7,000 farmers were directly reached through village-level interactions and awareness programs. Two events were organized to facilitate the release of the 20th and 21st installments of PM-Kisan, benefiting 492 farmers. Additionally, exhibitions, melas, and important day celebrations were organized, covering more than 3,000 participants and strengthening farmer–scientist interaction. Also conducted 10 days Village Adoption Program of students with NIFTEM Kundali from 19-27 Nov. 2025.

Technology Assessment, Demonstration, and Impact

KVK Fazilka demonstrated multiple improved technologies under various schemes, particularly under NFSM–Oilseeds. The Oilseeds Model Village programme revealed significant yield enhancement and higher benefit–cost ratios, with Sardarpura village recording the best performance. Cluster frontline demonstrations on mustard using improved varieties and micronutrient management resulted in yield increases of up to 17 percent over farmer practices. Demonstrations on foliar application of potassium nitrate in paddy and wheat, manganese sulphate in wheat, and improved water management practices in rice showed

improvements in yield, net returns, and water productivity, thereby confirming the economic viability of the technologies.

Natural Resource Management and CRM Technologies

To address the problem of crop residue burning and soil health degradation, KVK Fazilka promoted Crop Residue Management (CRM) technologies on 220.5 hectares. Technologies such as Super Seeder, Surface Seeder, and Zero Tillage drills resulted in an overall yield increase of 3.7 percent along with reduced cost of cultivation and improved benefit–cost ratios. These interventions significantly contributed to sustainable agriculture by conserving soil moisture, improving soil health, and reducing environmental pollution.

Advisory Services and Digital Extension

Digital and ICT-based extension services formed a major component of KVK Fazilka's outreach strategy. A total of 194 mobile agro-advisory messages were disseminated to 1,449 farmers covering crops, livestock, and weather, marketing, and awareness themes. Nineteen WhatsApp groups comprising 2,078 farmers were actively managed for real-time advisory dissemination. More than 7,000 farmers were registered on the Kisan SARATHI platform, ensuring enhanced access to scientific advisories and grievance redressal. All Monthly Progress Reports were uploaded on the KVK portal without delay.

Entrepreneurship Development and Women Empowerment

KVK Fazilka made significant contributions towards rural entrepreneurship and women empowerment through training, handholding, and market linkage support. Ten successful agri-entrepreneurs, including women-led Self Help Groups, were promoted in areas such as millet-based products, oils, pickles, honey, desi ghee, herbal products, bags, and knitted items. Two specialized beekeeping trainings trained 72 farmers, with nearly 75 percent adoption observed, resulting in enhanced honey production and supplementary income generation.

Monitoring, Diagnostic Visits, and Impact Assessment

KVK Fazilka conducted 129 diagnostic visits across more than 60 villages to identify field-level constraints related to agronomy, soil science, horticulture, post-harvest management, and agricultural engineering. Major issues such as imbalanced fertilizer use, soil salinity, pest mismanagement, low mechanization, and post-harvest losses were identified and addressed through targeted trainings, demonstrations, and advisory services. These efforts resulted in improved technology adoption, better resource use efficiency, and enhanced farm income.

On-Campus Trainings

Sr. No	Programme Title	Number of Participants	Date & Duration
1	Training on fruit drop and disorders of kinnow	20	20 March 2024
2	Summer season vegetables production technology	24	19 April 2024
3	CRM training	30	02-04 Sep 2024
4	CRM training	30	05-07 Sep 2024
5	Renewable energy technologies and energy efficiency practices	40	04 Sep 2024
6	Renewable energy technologies and energy efficiency practices	45	05 Sep 2024
7	SCSP training on nursery management	19	25-26 Sep 2024
8	Training on rabi crop production techniques	33	22 Oct 2024

Off-Campus Trainings

Sr. No	Programme Title	Number of Participants	Duration
1.	Poshan vatica at Kundal	50	26 Feb 2024
2.	Vermicompost training at Chirag Dhani	21	20 June 2024
3.	Kharif production training	40	21 June 2024
4.	Training on pickle making at Raipura	43	02 July 2024
5.	Training on value addition of milk and milk products at Dhrangwala	38	04 July 2024
6.	One day animal feed management and health camp at Pir Bakash Chauhan, Jalalabad	110	29 Aug 2024
7.	Vermicompost training at Aliana	25	08 Oct 2024
8.	Processing & value addition of citrus at Jandwala Hanwanta	30	28 Oct 2024
9.	Rabi production technology	34	22 Oct 2024

Extension Trainings

Sr. No	Programme Title	Number of Participants	Duration
1.	Development of low-cost balance diet for children	30	21-22 Nov 2024
2.	Value addition of millets	30	23-24 Nov 2024

Programs conducted under SCSP Scheme

Sr. No.	Date	Training	Total Candidates
1	11-15 March 2024	SCSP training on “Value addition and processing” under SCSP scheme	292
2	10-15 June 2024	SCSP training for farm women on value addition of fruits and vegetables	60
3	26-28 June 2024	SCSP training	25
4	29 Aug 2024	One day animal feed management at Pir Bakash, Jalalabad under SCSP	100
5	9-13 Sep 2024	SCSP training on processing & marketing techniques of seasonal fruits/vegetables and input distribution under SCSP scheme	25
6	25-26 Sep 2024	SCSP training on nursery management	19
7	28 Nov 2024	SCSP program by NBPGR in collaboration with Krishi Vigyan Kendra, Fazilka	200
8	04 Dec 2024	Wheat seed distribution under SCSP scheme	190

Extension Activities

Exhibitions

Sr. no.	Programme title	Venue	Duration
1	Exhibition at ICAT-ATARI, Zone-1, Ludhiana Foundation Day	ICAT-ATARI, Zone-1, Ludhiana	11 Jan 2024
2	Exhibition in kinnow fair	PAU, Regional Station, Abohar	23-24 Jan 2024
3	Exhibition in ber fair	ICAR-CIAH, Bikaner	08 March 2024
4	Exhibition in IIFA Kisan Mela	ICAR-CIPHET, Ludhiana	03-05 Oct 2024

Stakeholder/ officer/ farmer/ exposure visits

Sr. no.	Address of visitors	Number of visitors	Date
1.	Punjab Agro, Alamgarh	25	13 March 2024
2.	Punjab Agro, Alamgarh	25	12 June 2024
3.	Punjab Agro, Alamgarh	25	14 Sep 2024
4.	SAVPL Fazilka	30	03 Sep 2024
5.	SAVPL Fazilka	30	06 Sep 2024
6.	ICAR-CIPHET, Ludhiana (IIFA 2024)	450	03-05 Oct 2024

Celebration of Important Events

Sr. No	Name of Activity	Date	Venue	Participants
1	Ber fair tour	08 Feb 2024	Bikaner	05
2	International Women Day	08 March 2024	Chirag Dhani	110
3	Celebrated Environment Day	06 June 2024	CIPHET Premises	95
4	Celebration of ICAR Foundation Day	16 July 2024	CIPHET Premises	65
5	PM program release of 109 variety	11 Aug 2024	CIPHET Premises	42
6	Celebration of Independence Day	15 Aug 2024	CIPHET Premises	70
7	Tree plantation program	21 Aug 2024	CIPHET Premises	26
8	Tree planation at KVK premises	29 Aug 2024	CIPHET Premises	30
9	Tree plantation Ek Ped Maa Ke Naam	17 Sep 2024	KVK Premises	15
10	CIPHET IIFA 2024	03-05 Oct 2024	Ludhiana	450

Other Awareness Programs conducted in 2024-25

Sr. No	Name of Activity	Date	Venue	Participants
1	Awareness program on milk adulteration	08 July 2024	Khippawali	10
2	Awareness program on pest survilence	15 Aug 2024	CIPHET Premises	30
3	Awareness program on use and manufacturing of fermented organic manure/ liquid manure	16 Aug 2024	Kathera	45
4	Awareness program on spray of potassium nitrate in guava	16 Aug 2024	Kathera	45
5	Awareness program on alternate drying/wetting in rice	16 Aug 2024	Kathera	45
6	Cotton awareness program	21 Aug 2024	Raipura	32
7	Awareness program on use and manufacturing of fermented organic manure/ liquid manure	07 Sep 2024	CIPHET Premises	30

8	Awareness program on alternate drying/wetting in rice	08 Sep 2024	Roohreya Wali	42
9	Awareness program for girls on anemia control	06 Sep 2024	Khuia sarwar and Abohar	40
10	Awareness program for girls on anemia control	24 Sep 2024	Khui Khera	20
11	Awareness program on milk adulteration	18 Sep 2024	Abohar	09

OFT's

Sr. No	Title	Number
1.	Home Science	02
2.	Agri. Engineering	01

Front Line Demonstrations

Sr. No	Title	Number
1.	Agronomy (Crop Sciences)	08
2.	Horticulture	02
3.	Home Science	03

Progress under Crop Residue Management (CRM) Scheme

Demonstrations of CRM

Two Village Khui Khera and Khippawali were selected under CRM project of KVK, ICAR-CIPHET, Abohar to benefit the farmers regarding practices of residue management of paddy crop through CRM machinery to improve the soil health and productivity of the area. The DBT will be based on IN Situ management done by the farmers.

Khui Khera: About 2500-acre area in this village having paddy crop and for management of paddy straw is about 65 percent by using CRM Machinery and balling, to secure the fertility of soil as well as environment. We have selected farmers under this project.

Khippawali- About 400-acre area in this village having paddy crop and for management of paddy straw is about 67 percent by using CRM Machinery and balling, to secure the fertility of soil as well as environment. We have selected farmers under this project who managed paddy straw by using In Situ techniques.

Field Visits under CRM

Conducted more than 25 field visits under CRM in adopted villages for motivation to farmers regarding management of paddy straw via in situ management.

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पी सिवम्मा, ऋतू भरत कुकड़े, सौरभ मिश्र, राहुल कुमार राउत, अंकित कुमार एवं रवि प्रकाश (2025). सब्जी के बीजों के लिए बीज प्राइमिंग रणनीतियां। शोध पत्र – पांचवी राष्ट्रीय हिंदी वैज्ञानिक संगोष्ठी। 25 सितम्बर, 2025, आई सी ए आर – निनफेट, कोलकाता में आयोजित।

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Magazines

Tyagi, S.K., Indore, N., Kumar, V., Bembem, K. and Mohapatra S. (2024). IIFA 2024 Souvenir of ICAR-CIPHET IIFA (3-5 October 2024) ICAR-CIPHET, Ludhiana, Punjab (India). Pp-1-36.

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Chaudhary M, Kaur A, Aggarwal R, Kaur H, Bembem K and Sahni N (2025) Complementary Education Plan. Under the project 'Development of Complementary Education Plan of Health and Nutrition Awareness for School- Age Children' funded by ICSSR, New Delhi. PP-42

Thingujam Bidyalakshmi, Pradeep Rajan, Gurlovleen Phull Singh, K. Bembem, Surya Tushir and Ng. Joykumar Singh (2025). Hawaijar Maker, Standard Operating Procedure. Under the Project 'Mechanised system for making hawaijar-a traditional fermented food of North-East India; funded by DSIR, New Delhi.

Participation in conference/symposia/ workshops/meetings

Name of the official	Title of the programme / Name of conference/ seminar/ symposia/ workshop/ meetings	Organised by	Date
Ranjeet Singh	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 (PAU), Ludhiana, and the Department of Food Science, Nutrition and Technology, CSK, Himachal Pradesh Agricultural University, Palampur, in collaboration with the IAPEN India (Ludhiana Chapter).	29 Jan 2025
Amit Nath	59th Annual Convention of Indian Society of Agricultural Engineers (ISAE) on "Engineering Innovations for Agriculture 5.0" & "International Symposium on Mechatronics and Robotics in Pre and Postproduction Agriculture" & presented an oral paper on "Tomato Value Chain in India for Minimizing Post-Harvest Losses: A Case Study"	ICAR-CIAE, Bhopal	10-12 Nov 2025
	Participated in the 1st Nagaland Banana Festival 2025 cum National Workshop and presented a lead lecture on 23th October 2025 in the topic "Horticultural Crop Processing Technologies: An Overview of ICAR-CIPHET" during the 1st Nagaland Banana Festival 2025 cum National Workshop on Theme: Banana for Food-Fiber-Future.	Wokha, Nagaland	22-24 Oct 2025
	Participated in the "Global Conference on Innovations to Impact: Gender transformative approach for sustainable agri-food system" & presented a research paper on "Status of Tomato Processing Value Chain in India"	ICAR-CIWA, Bhubaneswar	8-10 March 2025
	Participated in one Day Workshop on Sustainable Rice Residue Management in Punjab	ICAR-IIMR, Ludhiana	28 Oct 2025
	Participated online a Brainstorming Session on "Horticultural Innovations to Enhance Export from India"	NAAS, NASC Complex, Dev Prakash Shastry Marg New Delhi 110012, India	28 Nov 2025
Rakesh Sharda	59th Annual Convention on Engineering Innovations for Agriculture 5.0	Indian Society of Agricultural Engineers, New Delhi	10-12 Nov 2025
	33rd National Conference of SCSI on Land and Water Management for Ecological Restoration and Agricultural Sustainability	Soil Conservation Society of India	08-10 Dec 2025
Manju Bala	National Seminar "Viksit Bharat 2047: Nutrition, Psychology and Screen Time: Status, Interplay, Challenges, and Way Forward	PAU, Ludhiana.	31 Jan 2025
	Wheat Milling Conclave, "The Future of Milling: Vision 2030 & beyond"	JW Marriot, Goa	03-04 March 2025

Name of the official	Title of the programme / Name of conference/ seminar/ symposia/ workshop/ meetings	Organised by	Date
SK Tyagi, Manju Bala, Deepika Goswami, Swati Sethi, Surya Tushir, Chandan Solanki, Guru PN, Urhe Sumit Bhausaheb	One day Workshop on 'Sustainable Rice Residue Management in Punjab' (Towards Cleaner Air and Healthier Soils)	ICAR-IIMR, Ludhiana jointly organized by ICAR-IIMR and ICAR-CIPHET, Ludhiana.	28 Oct 2025
Ramesh Chand Kasana	National Conference on Mushroom Biology and Products: Current Status and Future Trends	ICAR-DMR, Solan, HP	07-08 Aug 2025
	One day Workshop on "Biotech Interventions in Maize: Challenges and Opportunities"	ICAR-IIMR, Ladhowal, Ludhiana	01 Sept 2025
	One day Workshop on Sustainable Rice Residue Management in Punjab	ICAR-IIMR, Ladhowal, Ludhiana	28 Oct 2025
	International Conference on "BIOINNOVATE: Bridging Science and Society for Sustainable Development Goals"	LPU, Phagwara, Punjab	30-31 Oct 2025
Mahesh Kumar Samota	Workshop on "Statistical Computing and Analysis of Survey Data in agriculture research: methods and techniques"	ICAR-Indian Agricultural Statistics Research Institute, Pusa New Delhi	09-15 Sept 2025
	Participated in one Day Workshop on Sustainable Rice Residue Management in Punjab	ICAR-IIMR, Ludhiana	28 Oct 2025
Rahul Kumar Anurag	FAD 16 Foodgrains, Starches and Ready to Eat Foods to adopt ISO/TC 93 'Starch (including derivatives and by-products)	BIS (Bureau of Indian Standards)	14 Nov 2025
	Innovations in Food Processing &Flavor Technologies: Advancing Safety, Nutrition and Health	International Life Sciences Institute-India	09 Dec 2025
Pankaj Kumar	59th ISAE Annual Convention & International Symposium	ICAR–CIAE, Bhopal, India	10-12 Nov 2025
Sujata Sethi	Innovations in Agricultural Extension: Integrating Research, Policy and Practices	MANAGE, Hyderabad	20 Aug 2025
	Training Programme for development of Master Trainers under Rashtriya Karmayogi Jan Seva Programme – Phase II (Zone-IV)	ICAR-NDRI, Karnal	8-10 Dec 2025
Rahul S Yadav	INTECH-2025 "Innovations in Food Processing and Flavour Technologies: Advancing Safey, Nutrition and Health"	Organized by IISI-Intemational Life Science Institute, India and ICAR-CIPHET, Ludhiana at Hotel LeMeridien, New Delhi	09 Dec 2025
Swati Sethi	Global Conference on 'Innovations to Impact: Gender Transformative Approach for Sustainable Agri-Food System (IIGASA-2025)	ICAR-CIWA, Bhubaneswar, Odisha.	08-10 March 2025
	59th Annual Convention on Engineering Innovations for Agriculture 5.0 and International Symposium on Mechatronics and Robotics in Pre and Post Production Agriculture	CIAE, Bhopal	10-12 Nov 2025

Name of the official	Title of the programme / Name of conference/ seminar/ symposia/ workshop/ meetings	Organised by	Date
	Brainstorming session on Roadmap for Viksit Bharat: Cultivation and Processing of other Aquatic Crops, on National Makhana Day	NRC Makhana Darbhanga	07 Oct 2025
	INTECH-2025 “Innovations in Food Processing and Flavour Technologies: Advancing Safey, Nutrition and Health”	Organized by IISI-Intemational Life Science Institute, India and ICAR-CIPHET, Ludhiana at Hotel LeMeridien, New Delhi	09 Dec 2025
Urhe Sumit Bhausaheb	National Seminar on ‘Apiculture Innovations and entrepreneurship: igniting ideas, inspiring enterprises	Organized by ICAR-CIPHET and BIS, New Delhi at ICAR-CIPHET Ludhiana On	20 June 2025
	Indo-Swedish workshop on Micro/nano sensors and their applications in environmental analysis	BITS Pilani Goa BITS Pilani, KK Birla Goa campus, Goa	15-16 Oct 2025
	Presented a poster on “Optimization of Colorimetric ELISA Protocol for Aflatoxin B1 Analysis in maize” 59th Annual Convention- engineering innovations for agriculture 5.0	ICAR-CIAE, Bhopal	10-12 Nov 2025
Deepika Goswami	Global Conference on ‘Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food system’	ICAR-CIWA, Bhubaneswar, India.	08-10 March 2025
	National Conference on “Food Innovations, Food Allergies and Traditional Foods”	Sant Longowal Institute of Engineering and Technology, Longowal (Punjab), India.	11-12 Dec 2025
Surya Tushir	Valorizing Agro-Industrial Residues: Protein Extraction as a Strategy to Address Nutritional Deficiencies	National Seminar on "Viksit Bharat 2047: Nutrition, Psychology, and Screen Time: Status, Interplay, Challenges, and Way Forward, PAU, Ludhiana	29 Jan 2025
	Global Conference on Innovations to Impact: Gender Transformative Approach for Sustainable Agri-food Systems (IIGASA)	ICAR-CIWA, Bhubneswar	08-10 March 2025
	Sustainable Rice Residue Management in Punjab’ (Towards Cleaner Air and Healthier Soils)	ICAR-IIMR, and ICAR-CIPHET, Ludhiana.	28 Oct 2025
Guru P. N.	59th ISAE Annual Convention on Engineering Innovations for Agriculture 5.0” and International Symposium on Mechatronics and Robotics in Pre and Post production Agriculture	ISAE and ICAR-CIAE, Bhopal	10-12 Nov 2025
Chandan Solanki	International Exhibition on India Agri Expo 2026 - Agricultural Machinery and Dairy Technology	Ludhiana Exhibition Centre, Ludhiana	30 Jan - 01 Feb 2026

Name of the official	Title of the programme / Name of conference/ seminar/ symposia/ workshop/ meetings	Organised by	Date
Ravi Prakash	51st Dairy Industry Conference (National Conference), organized by Indian Dairy Association	Gyan Bhawan, Samrat Ashoka Convention Kendra, Patna.	06-08 March 2025
	Future Foods Congress 2025 (International Conference) - Bridging the future of sustainability and food science	Singapore Expo, Singapore	16-18 June 2025
	A Brainstorming on "Animal Structures and Food Systems: A Cross-Disciplinary Dialogue	ICAR-CIRG, Mathura	21-22 July 2025
	One Day Workshop *on* Sustainable Rice Residue Management in Punjab	ICAR-IIMR and ICAR-CIPHET, Ludhiana	28 Oct 2025
	4th meeting of Dairy Equipment Sectional Committee, FAD 3	BIS, Govt. of India, at IDMC, Anand, Gujarat (Online Mode).	02 April 2025
Thingujam Bidyalakshmi	National Seminar on "Vision Viksit Bharat@2047: Fostering Inclusive Societal Development through Health and Wellness for All"	PAU, Ludhiana	28 Feb 2025
Poonam	Sustainable rice residue management in Punjab	ICAR-IIMR, Ludhiana	28 Oct 2025
	Biotech Interventions in Maize: Challenges and Opportunities	ICAR-Indian Institute of Maize Research, Ludhiana, and Biotech Consortium India Limited (BCIL), New Delhi	01 Sept 2025
	Apicultural Innovation and Entrepreneurship: Igniting Ideas, Inspiring Enterprises	ICAR-CIPHET, Ludhiana	20 June 2025
Yogesh Kalnar	Model-It 2023 - VII International Symposium on Applications of Modelling as an Innovative Technology in the Horticultural Supply Chain	Potsdam, Germany	11-14 June 2023
	SLIM 2024- 11th Shelf Life International Meeting	Reggio Emilia, ITALY	20-24 May 2024
	International Joint Symposium: Agriculture and Food Security (2024)	School of Agro-Industry, Mae Fah Luang University, Thailand. (online)	07 Sept 2024
	FRUIT LOGISTICA 2025	Messe Berlin GmbH . Messedamm 22, Berlin, Germany.	05-07 Feb 2025
	CAMA 2025: XIV Annual International Controlled Atmosphere and Modified Atmosphere Research Conference	Washington State University, Wenatchee, WA, USA	18-22 May 2025
Shaghaf Kaukab	National seminar on "Progresive Agriculture-Viksit Bharat: Preparedness for Eastern Region (PAVER-2025)	ICAR-RCER, Patna in collaboration with Indian Society of Agronomy BAU Chapter, Sabour	21-23 Feb 2025

Name of the official	Title of the programme / Name of conference/ seminar/ symposia/ workshop/ meetings	Organised by	Date
	International Conference, Global Conference-2025 on, "Gender Transformative Approach for Sustainable Agri-food Systems (IIGASA–2025) during March 8 to 10. 2025.	ICAR-CIWA & RAGA	08-10 March 2025
	National Seminar, ICSSR Sponsored National Seminar on "Vision Viksit Bharat@2047: Fostering Inclusive Societal Development through Health and Wellness for All"	Department of Food and Nutrition, College of Community Science Punjab Agricultural University, Ludhiana	28 Feb 2025
	National Conference on "Food Innovations, Food Allergies & Traditional Foods" as FIFATF-2025	SLIET Longowal	11-12 Dec 2025
K Bembem	National Seminar on 'Futuristic Agriculture: Technology, Sustainability and beyond'	Society for Community Mobilization for Sustainable Development at Umiam, Meghalaya	22-24 May 2025
	Official Language Department Golden Jubilee Celebration	Department of Official Language, Ministry of Home Affairs at Bharat Mandapam Convention Centre, New Delhi.	26 June 2025
Renu Balakrishnan	National Seminar on 'Futuristic Agriculture: Technology, Sustainability and beyond'	Society for Community Mobilization for Sustainable Development at Umiam, Meghalaya	22-24 May 2025
Vikas Kumar	59 Annual Convention of Society of Agricultural Engineers (ISAE) on Engineering Innovations for Agriculture 5.0 & International Symposium on Mechatronics and Robotics in Pre and Post Production Agriculture	Indian Society of Agricultural Engineers (ISAE)	10-12 Nov 2025
	14th Asian Fisheries and Aquaculture Forum (14AFAF)	Asian Fisheries Society (AFS), Malaysia; ICAR, the Indian Council of Agricultural Research (ICAR), New Delhi; Department of Fisheries (DoF), Government of India; and the Asian Fisheries Society, Indian Branch (AFSIB), Mangalore, India	12-15 Feb 2025
Shilpa S Selvan	59th Annual Convention of Indian Society of Agricultural Engineers (ISAE) on "Engineering Innovations for Agriculture 5.0" & "International Symposium on Mechatronics and Robotics in Pre and Postproduction Agriculture" at ICAR-CIAE, Bhopal during November 10-12, 2025 & presented an oral paper on "Development of different cellulose extraction process through valorisation of rice straw and its characterization"	ICAR-CIAE, Bhopal	10-12 Nov 2025

Prioritization, Monitoring and Evaluation (PME) Cell

The Project Monitoring and Evaluation (PME) Cell plays a pivotal role in coordinating and supervising the research activities of the Institute. It organizes and facilitates meetings of the Institute Research Council, maintains comprehensive project records, and compiles periodic progress reports from scientists. Acting as a vital link between the Council and researchers, the PME Cell ensures effective communication and streamlined project execution. In addition, the Cell manages Parliament questions and other official matters related to the Institute's scientific programmes. It also operates the Project Information and Management System (PIMS) to digitally administer research project data, covering both ongoing and completed projects. This centralized platform supports unified priority setting, systematic monitoring of externally funded and in-house projects, and enhances overall efficiency in research project management.

Research Projects (2025)

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
List of In-house projects:					
1.	Techno-economic feasibility assessment and socio-economic impact analysis of selected post-harvest technologies	Dr. Renu Balakrishnan, Scientist (PI)	01.07.2021	30.06.2025	01.07.2021 30.06.2025
		Dr Sandeep Mann, Pr. Scientist (Co-PI)	01.07.2021	30.06.2025	
		Dr Reshma Gills, Scientist (Co-PI) - ICAR-CMFRI, Cochin	01.07.2021	30.06.2025	
		Ms. Soumya Mohapatra (Co-PI)	01.07.2024	30.06.2025	
2.	Biospeckle laser technique for post-harvest quality and safety evaluation of Agricultural produce	Er. Shaghaf Kaukab (PI)	01.07.2022	30.06.2025	01.07.2022 30.06.2025
		Dr. R. C. Kasana, (Co-PI)	01.07.2022	30.06.2025	
		Dr. Khwairakpam Bembem (Co-PI)	01.07.2022	30.06.2025	
3.	Real-time fruit quality monitoring using digital twins and machine learning during storage	Dr. Dhritiman Saha (PI).	01.08.2023	Till date	01.08.2023 31.07.2026
		Er. Thongam Sunita Devi (Co-PI)	01.08.2023	Till date	
		Dr. Ranjeet Singh (Co-PI)	01.08.2023	Till date	
4.	Metabolite profiling and sprouting inhibition of Onions for prolonged storage	Mahesh Kumar Samota (PI)	01.08.2023	Till date	01.08.2023 31.07.2026
		Dr. Poonam Choudhary (Co-PI)	01.08.2023	Till date	
		Dr Amit Nath (Co-PI)	01.08.2023	Till date	
5.	Development of functional coating for preservation of minimally processed fruits and vegetables	Dr. Ramesh Kumar (PI)	01.08.2023	Till date	01.08.2023 31.07.2026
		Dr. Amit Nath (Co-PI)	01.08.2023	Till date	
		Dr. Sandeep Raheja, Plant Pathologist, PAU, Abohar campus (Co-PI)	01.08.2023	Till date	
6.	Development and Evaluation of a Waterless Live Fish Transportation System for Freshwater Fish	Dr. Armaan U. Muzaddadi (PI)	01.08.2023	11.03.2024	01.08.2023 31.07.2026
		Dr. Vikas Kumar (Co-PI) & PI	01.08.2023 12.03.2023	11.03.2024 Till date	
		Dr. Ranjeet Singh (Co-PI)	01.07.2024	Till date	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
7.	Development of a PCM based energy-efficient vending cart for fruits and vegetables	Dr. Ravi Prakash (PI)	01.07.2024	Till date	01.07.2024 30.06.2026
		Dr. Sandeep Mann (Co-PI)	01.07.2024	Till date	
8.	Development of a Model Dairy Structure for Peri-Urban Areas	Dr. Ravi Prakash (PI)	01.07.2024	30.06.2025	01.07.2024 30.06.2025
9.	Development of self-cooling coating for sustainable environment control	Dr. Abhinav Dubey (PI)	01.07.2024	Till date	01.07.2024 30.06.2026
		Dr. Shrikrishna Nishani (Co-PI)	01.07.2024	Till date	
		Dr. Sandeep Mann (Co-PI)	01.07.2024	Till date	
10.	Development of Visible Light Induced Composite (C-Dot/TiO2) Photocatalytic Reactor for Ethylene Degradation	Dr. Shrikrishna Nishani (PI)	01.07.2024	Till date	01.07.2024 30.06.2027
		Dr. Abhinav Dubey (Co-PI)	01.07.2024	Till date	
11.	Identification of Aril browning and Blackening (Black Heart Disease) in Pomegranate using X-ray imaging	Er. Ritu Bharat Kukde (PI)	01.07.2024	Till date	01.07.2024 30.06.2026
		Er. Shaghaf Kaukab (Co-PI)	01.07.2024	Till date	
		Dr. Navnath Indore (Co-PI)	01.07.2024	Till date	
		Er. Thongam Sunita Devi (Co-PI)	01.07.2024	Till date	
		Dr. Pinki Raogond, Scientist, ICAR-NRCP, Solapur (Co-PI)	01.08.2024	Till date	
		Dr. Manjunath N., Scientist, ICAR-NRCP, Solapur (Co-PI)	01.08.2024	Till date	
12.	Development of a biosensor-based kit for quality detection of Aflatoxin B1 in maize	Er. Urhe Sumit Bhausaheb (PI)	01.07.2024	Till date	01.07.2024 30.06.2027
		Dr. Surya (Co-PI)	01.07.2024	Till date	
		Prof Sunil Bhand, BITS Pilani (Co-PI)	01.07.2024	Till date	
13.	Value chain management of tomato for minimization of post-production losses	Dr. Amit Nath (PI)	01.07.2024	30.06.2025	01.07.2024 30.06.2025
		Dr. Ramesh Kumar (Co-PI)	01.07.2024	30.06.2025	
14.	Assessing the Impact of Farmer Producer Organizations (FPOs) on Agro-Processing in Trans-Gangetic Plains of India	Dr. Soumya Mohapatra (PI)	01.07.2024	Till date	01.07.2024 30.06.2027
		Dr. Renu Balakrishnan (Co-PI)	01.07.2024	Till date	
		Dr. Rahul Kumar Anurag (Co-PI)	01.07.2024	Till date	
15.	Creation of online mass media based digital repository of selected CIPHET technologies and digital interface for stakeholders	Dr. Rahul Kumar Anurag (PI)	01.07.2024	Till date	01.07.2024 30.06.2026
		Dr. Ranjeet Singh (Co-PI)	01.07.2024	Till date	
		Dr. Sandeep Dawange (Co-PI)	01.07.2024	Till date	
		Dr. Vikas Kumar (Co-PI)	01.07.2025	Till date	
16.	Development of on-farm maize cob drying system for effective value chain	Dr. Pankaj Kumar (PI)	01.07.2024	30.06.2025	01.07.2024 30.06.2025
		Er. Shaghaf Kaukab (Co-PI)	01.07.2024	30.06.2025	
		Dr. Sumit Kumar Aggarwal, IIMR Ldh (Co-PI)	01.07.2024	30.06.2025	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
17.	Study on determination of storage losses for mustard oilseeds (Brassica juncea. L.) in bag and silo storage systems.	Dr. Abhinav Dubey (PI)	01.07.2025	Till date	01.07.2025 30.06.2027
		Dr. Poonam (Co-PI)	01.07.2025	Till date	
		Dr. Sandeep Mann (Co-PI)	01.07.2025	Till date	
18.	Development of rapid spectrophotometric method for monitoring quality of used frying oil	Dr. Swati Sethi (PI)	01.07.2025	Till date	01.07.2025 30.06.2026
19.	Design and Development of an FRP-Based Air Jet Mill for Milling Applications of Food Grains	Dr. Pankaj Kumar (PI)	01.07.2025	Till date	01.07.2025 30.06.2028
		Dr. Swati Sethi (Co-PI)	01.07.2025	Till date	
		Dr. Ranjeet Singh (Co-PI)	01.07.2025	Till date	
20.	Development of process and system for making flexibly packaged peanut butter slice.	Dr. Khwairakpam Bembem (PI)	01.07.2025	Till date	01.07.2025 30.06.2027
		Dr. Sandeep P Dawange (Co-PI)	01.07.2025	Till date	
		Dr Rahul Anurag (Co-PI)	01.07.2025	Till date	
21.	Rapid NIR screening of golden rice vs conventional rice	Dr. Maharishi Tomar (PI)	01.10.2025	Till date	01.10.2025 30.09.2026
		Dr. Manju Bala (Co-PI)	01.10.2025	Till date	
22.	Development of an imaging setup for authentication and adulteration detection in selected spices based on visual signatures	Dr. Leena Kumari (PI)	01.10.2025	Till date	01.10.2025 30.09.2027
		Dr. Deepika Goswami (Co-PI)	01.10.2025	Till date	
		Dr. Shaghaf Kaukab (Co-PI)	01.10.2025	Till date	
23.	Development of plant-based meat analogues using 3D printing technique	Dr. Deepika Goswami (PI)	01.10.2025	Till date	01.10.2025 30.09.2027
24.	Design and Development of Pilot-Scale Ultrasound - Assisted Extraction System for Enhanced Recovery of Bioactive Compounds from Biological Material.	Dr Rahul Subhash Yadav (PI)	01.10.2025	Till date	01.10.2025 30.09.2028
		Dr Manju Bala (Co-PI)	01.10.2025	Till date	
		Dr. Sumit Urhe (Co-PI)	01.10.2025	Till date	
25.	Waste-to-Wealth: Transforming Rice Husk Fly Ash into High-Purity Silica & Silicon for Strategic Industries	Dr. S. K. Tyagi, (PI)	01.10.2025	Till date	01.10.2025 30.09.2027
		Dr. Navnath Indore Sakharam (Co-PI)	01.10.2025	Till date	
		Er. Sumit Urhe (Co-PI)	01.10.2025	Till date	
26.	Development of mini millet mill	Dr. Chandan Solanki (PI)	01.10.2025	Till date	01.10.2025 30.09.2027
		Dr. Rahul Subhash Yadav (Co-PI)	01.10.2025	Till date	
27.	Development of nutritionally enriched Malt-Based value-added Products	Dr Sujata Sethy (PI)	01.10.2025	Till date	01.10.2025 30.09.2027

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
ICAR Funded Projects under National Agriculture Innovation Fund (NAIF): Component-I					
28.	Agri Business Incubation and ITMU	Dr. Ranjeet Singh (PI)	06.02.2024	Till Date	06.02.2024 31.09.2026
		Dr. Renu Balakrishnan (Co-PI)	06.02.2024	Till Date	
		Dr A Ahlawat	06.02.2024	Till Date	
		Dr Soumya Mohapatra	06.02.2024	Till Date	
ICAR-Funded Project - Under *Special Call for Project Proposals on Genome Editing-Mediated Avenues in Agriculture*					
29.	Genetic modification of yeast (*Saccharomyces cerevisiae*) for improving xylitol production from corn cob	Dr. R.C. Kasana (PI)	01.11.2023	Till date	01.11.2023 31.10.2026
		Dr. Poonam (Co-PI)	01.11.2023	Till date	
List of ICAR Funded Project under CRP on Secondary Agriculture (SA)					
30.	Reformation of Makhana processing and value-addition industry through mechanization and automation.	Dr. R.K. Vishwakarma (PI)	01.04.2021	31.03.2026	01.04.2021 31.03.2026
		Dr. Mridula D. (Co-PI)	01.04.2021	11.11.2022	
		Dr. Ranjeet Singh (Co-PI)	01.04.2021	31.03.2024	
		Dr. Kh. Bembem (Co-PI)	01.04.2021	31.03.2026	
		Dr. Guru P.N. (Co-PI)	01.09.2022	31.03.2026	
		Dr. Swati Sethi. (Co-PI)	01.04.2024	31.03.2026	
		Dr. Rahul Kumar Raut (Co-PI) ICAR-NRC for Makhana, Darbhanga)	01.04.2024	31.03.2026	
31.	Extraction of bioactive compounds and value addition of by-products of agri-produce	Dr. Manju Bala (Co-PI) & (PI)	01.09.2022 21.12.2022	20.12.2022 31.03.2026	01.04.2021 31.03.2026
		Dr. Mridula D. (PI)	01.04.2021	11.11.2022	
		Dr. Deepika Goswami (Co-PI)	01.04.2021	31.03.2026	
		Er. Akhoon Asrar Bashir (Co-PI)	01.04.2021	23.06.2022	
ICAR-Funded Project - Under CRP on Natural Fiber (NF), ICAR-CIRCOT, Mumbai					
32.	Development of building materials using natural fibers and other fibrous crops- Reinforcement of concrete bricks/blocks using fibre from crop residues under CRP on Natural Fiber (NF) CIRCOT, Mumbai	Dr. Sandeep Mann (CC-PI)	16.05.2024	Till date	16.05.2024 15.05.2027
		Dr. Thingujam Bidyalakshmi Devi (Co-CCPI)	16.05.2024	Till date	
		Dr. Abhinav Dubey (Co-CCPI)	16.05.2024	Till date	
ICAR Funded Projects 2023 under Farmer FIRST Programme (FFP)					
33.	Farmers First Project entitled “Processing and Value Addition of Agricultural Produce for Enhancing Farmers income and Employment in Production Catchment with revised mandate to cover whole State of Punjab	Dr. Sandeep Mann (PI)	01.04.2020	Till date	01.04.2020 30.09.2026
		Dr. A.K. Dixit, Pr. Scientist, ICAR-NDRI, Karnal (Co-PI continue)	01.04.2020	31.03.2024	
		Dr. Rahul Kumar Anurag (Co-PI)	01.04.2020	31.03.2024	
		Dr. Renu Balakrishnan (Co-PI)	01.04.2020	Till date	
		Dr. Soumya Mohapatra (Co-PI)	01.04.2024	Till Date	
		Dr. Rajiv Sharma (Co-PI)	01.04.2024	Till Date	
		Er. Yogesh Kalnar (Co-PI)	01.04.2020	28.10.2022	
		Dr. B.V.C Mahajan (Co-PI) Director & Prof., (PHPTC)	01.04.2020	Retired on 31.03.2023 Till Date	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
List of ICAR Funded Projects under ICAR-ATARI, Zone-I, Ludhiana					
34.	Agri Drone Project (ADP) under ICAR-ATARI, Zone-I, Ludhiana	Dr. Leena Kimari (PI)	08.07.2022	31.03.2026	08.07.2022 31.03.2026
		Dr. Mahesh Kumar Samota (Co-PI)	08.07.2022	31.03.2026	
ICAR Funded Projects under AICRP on PEASEM at HCP Division, Regional Station, ICAR-CIPHET, Abohar					
35.	Development and characterization of bioplastic using rice straw cellulose	Dr. Shilpa S. Selvan (PI)	01.04.2024	16.01.2025	01.04.2024 31.03.2025
		Dr. Mahesh Kumar Samota (Co-PI)	01.04.2024	31.03.2025	
		Dr. Amit Nath (Co-PI)	01.04.2024	31.03.2025	
36.	Development of a portable cool crates for horticultural crops	Dr. Shilpa S. Selvan (PI)	01.04.2025	16.01.2025	01.04.2025 31.03.2027
		Dr. Mahesh Kumar Samota (Co-PI)	01.04.2025	Till date	
List of Externally Funded Projects					
37.	Development of image (Visual and X-Ray) based mango sorting and grading system and sensor-based monitoring system with block chain technology for supply chain of banana *Co-operating Center under ICAR-Network Project on Precision Agriculture (NePPA)*	Dr. Nachiket Kotwaliwale, Director (Mentor)	08.09.2021	07.09.2025	08.09.2021 07.09.2025
		Dr. K. Narsaiah, Pr. Scientist & Acting Head, AS&EC Division (PI)	08.09.2021	28.10.2022	
		Er. Yogesh B. Kalnar, Scientist, A&ST Division (Co-PI)	08.09.2021	28.10.2022	
		Dr. Bhupendra M. Ghodki, Scientist, AS&EC Division (Co-PI)	08.09.2021	28.08.2023	
		Dr. Leena Kumari, Scientist, A&ST Division (Co-PI) & PI	08.09.2021 14.12.2022	13.12.2022 07.09.2025	
		Dr. Thingujam Bidyalakshmi Devi, Scientist, AS&EC Division (Co-PI)	08.09.2021	07.09.2025	
		Er. Thongam Sunita Devi, Scientist, A&ST Division (Co-PI)	08.09.2021	07.09.2025	
		Dr. P. Suresh Kumar, ICAR-NRC, Banana (CC-PI)	08.09.2021	07.09.2025	
		Dr. Dhritiman Saha Scientist (Co-PI)	08.05.2023	07.09.2025	
38.	Mechanized system for making Hawaijar - a traditional fermented food of North-East India	Dr. Thingujam Bidyalakshmi Devi (PI)	01.10.2021	30.06.2025	01.10.2021 30.06.2025
		Dr. Surya (Co-PI)	01.10.2021	30.06.2025	
		Dr. Khwairakpam Bembem	01.10.2021	30.06.2025	
		Dr. Ng. Joy Kumar (C0-PI from CoFT, CAU, Imphal)	01.10.2021	30.06.2025	
39.	Collaborative Contract research project entitled “Development of grain image processing software for rice and paddy”	Dr. Dhritiman Saha (PI)	09.06.2023	31.03.2026	09.06.2023 31.03.2026
		Dr. Ranjeet Singh (Co-PI)	09.06.2023	31.03.2026	
		Dr. Nachiket Kotwaliwale (Co-PI)	09.06.2023	31.03.2026	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
40.	ICAR-DOCA Project entitled "Study on Determining Storage Losses of pulses stored in Warehouses and to Recommend Norms for Loss/Gain during Long term Storage."	Dr. Nachiket Kotwaliwale (Coordinator)	14.09.2023	Till Date	14.09.2023 13.03.2027
		Dr. R. K. Vishwakarma (PI)	14.09.2023	Till Date	
		Dr. Guru P. N. (Co-PI)	14.09.2023	22.01.2026	
		Dr. Thingujam Bidyalakshmi Devi (Co-PI)	14.09.2023	Till Date	
		Dr. Sandeep P. Dawange (Co-PI	14.09.2023	Till Date	
		Er. Shaghaf Kaukab (Co-PI)	14.09.2023	Till Date	
		Dr. Navnath Indore Sakharam (Co-PI)	05.08.2024	Till Date	
41.	Collaborative project on "Research, Development & Capacity Building Activities on Processing & Value Addition of Forest Produce of Chhattisgarh State" between ICAR-CIPHET, Ludhiana as Nodal Agency and CGMFPFED	Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET (Mentor)	24.08.2023	Till Date	24.08.2023 23.08.2028
		Dr. R.K. Vishwakarma, Principal Scientist & PC PHET (Mentor)	24.08.2023	Till Date	
		Dr. Manju Bala (PI)	24.08.2023	Till Date	
		Dr. Sandeep Mann (Co-PI)	24.08.2023	Till Date	
		Ms. Surya (Co-PI)	24.08.2023	Till Date	
		Dr. Swati Sethi (Co-PI)	24.08.2023	Till Date	
		Dr. Chandan Solanki (Co-PI)	24.08.2023	Till Date	
		Dr. Pankaj Kumar (Co-PI)	24.08.2023	Till Date	
		Dr. Poonam (Co-PI)	24.08.2023	Till Date	
		Dr. Th Bidyalakshmi Devi (Co-PI)	24.08.2023	Till Date	
		Dr. Sandeep P. Dawange (Co-PI)	24.08.2023	Till Date	
		Dr. Guru P.N (Co-PI)	24.08.2023	22.01.2026	
42.	Establishment of millet processing facility and development of value-added products from millets.	Dr. Manju Bala – PI	15.03.2024	Till Date	15.03.2024 15.01.2027
		Dr. Deepika Goswami, - Co-PI	15.03.2024	Till Date	
		Dr. Swati Sethi, Co-PI	15.03.2024	Till Date	
		Dr. Chandan Solanki - Co-PI	15.03.2024	Till Date	
		Dr. Pankaj Kumar - Co-PI	15.03.2024	Till Date	
		Dr. Guru P.N. - Co-PI	15.03.2024	22.01.2026	
		Mrs. Surya - Co-PI	15.03.2024	Till Date	
		Er. Urhe Sumit Bhausaheb (Co-PI)	15.03.2024	Till Date	
43.	Collaborative research project entitled, "Development of Day-Night Solar Insect Trap"	Dr. Guru P.N. (PI)	22.03.2024	31.07.2025	22.03.2024 31.07.2025
		Er. Urhe Sumit Bhausaheb (Co-PI)	22.03.2024	31.07.2025	
44.	Up-scaling of chitosan and thymol based smart nano formulations to control fungal diseases and fall armyworm in maize crop	Dr. Poonam (PI)	26.04.2024	Till Date	26.04.2024 25.04.2027
		Dr. Sandeep Mann (Co-PI)	26.04.2024	Till Date	
		Dr. Shrikrishna Shrinivas Nishani (Co-PI)	26.04.2024	Till Date	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
45.	Sensitizing stakeholders to minimize food loss and waste through awareness programmes. *[Funded by CSR, Vardhman textiles limited, Chandigarh Road, Ludhiana.]*	Dr Manju Bala (PI)	01.10.2024	30.09.2025	01.10.2024 30.09.2025
		Dr Surya (Co-PI)	01.10.2024	30.09.2025	
		Dr. Chandan Solanki (Co-PI)	01.10.2024	30.09.2025	
		Sh. Lakhwinder Singh (Co-PI)	01.10.2024	30.09.2025	
46.	Assessment of Oilseeds and Pulse Production and Processing Potential for Economic Prosperity and Sustainable Development: A study of Punjab"	Dr. Gurdeep Singh, Deputy Director (T), KVK, Bhatinda (PI)	10.09.2024	09.12.2025	10.09.2024 09.12.2025
		Dr. Renu Balakrishnan (Co-PI)	10.09.2024	09.12.2025	
		Prof. Amandeep Singh Brar (Co-PI)	10.09.2024	09.12.2025	
		Prof. Bikramjit Singh (Co-PI)	10.09.2024	09.12.2025	
		Associate Prof. Sanjeev Kumar Katria (Co-PI)	10.09.2024	09.12.2025	
		Assistant Prof. Ramandeep Kaur (Co-PI)	10.09.2024	09.12.2025	
		Sh. Harinder Singh, AB Engineer (Co-PI)	10.09.2024	09.12.2025	
47.	Strategies for Reducing Post-harvest Losses in Selected Fruits and Vegetables, [Under The World Resources Institute's (WRI) Food Land and Water Program has awarded Indian Council of Agricultural Research (ICAR) ("Subrecipient") US $177,550 in support of a project for the adoption of appropriate on-farm technologies for reducing post-harvest losses of onions and other fruits and vegetables in Madhya Pradesh and Maharashtra, India.]	Dr. Nachiket Kotwaliwale (Mentor)	01.01.2025	31.08.2025	01.01.2025 31.08.2025
		Dr. Sandeep Mann (PI)	01.01.2025	31.08.2025	
		Dr. Shrikrishna Shrinivas Nishani (Co-PI)	21.04.2025	31.08.2025	
		Dr. Abhinav Dubey (Co-PI)	21.04.2025	31.08.2025	
		Dr. Ravi Prakash (Co-PI)	21.04.2025	31.08.2025	
48.	Consultancy Research Project entitled, "Validation of PICS (Purdue Improved Crop Storage) bags for storage of selected commodities"	Dr. Guru PN (PI)	12.02.2025	11.10.2025	12.02.2025 11.10.2025
		Dr. Swati Sethi (Co-PI)	12.02.2025	11.10.2025	

Sr. No.	Project Name	Project Leader & Associates	Period of Association		Project period
			From	To	
49.	Study on Loss or Gain in Weight/Bulk Driage/Shrinkage or Absorption of Moisture in Millets during Storage" between Chhattisgarh State Minor Forest Produce (Training and Development) Co-operative Federation Limited (CGMFPFed), Raipur & ICAR-CIPHET, Ludhiana	Dr. Nachiket Kotwaliwale, Director, ICAR-CIPHET (Mentor)	25.04.2025	Till Date	25.04.2025 24.06.2026
		Dr. R.K. Vishwakarma, PC AICRP on PHET (Mentor)	25.04.2025	Till Date	
		Dr. Guru P.N (PI)	25.04.2025	22.01.2026	
		Dr. Manju Bala (Co-PI)	25.04.2025	Till Date	
		Dr. Sandeep Mann (Co-PI)	25.04.2025	Till Date	
		Dr. Chandan Solanki (Co-PI)	25.04.2025	Till Date	
50.	Development of Device for non-destructive estimation of tender coconut water volume	Dr. Abhinav Dubey (PI)	09.07.2025	Till Date	09.07.2025 08.07.2028
51.	Collaborative contract research project on "Development of protein recovery technology from cold-pressed and expeller-pressed sesame and groundnut meals". (Between ICAR-CIPHET, Ludhiana and M/s Steady Rootz, Dindigul, Tamil Nadu)	Dr. Surya (PI)	30.07.2025	Till Date	30.07.2025 29.07.2026
		Dr. Manju Bala (Co-PI)	30.07.2025	Till Date	
52.	International joint research collaborative project entitled, "Image based phenotyping and multi-omic prediction schemes for horticultural crop improvement" under QUAD AI ENGAGE initiative of Government of India	Dr. Dhritiman Saha, Collaborating Institute-PI (CIP)	01.10.2025	Till Date	01.10.2025 30.06.2028

Research & Administrative Meetings

27th Research Advisory Committee Meeting (RAC)

The SMD (Engg.), ICAR, KAB-II, Pusa, New Delhi vide File No. A. Engg. 05/02/2024 - (A.E) E-File No. 300590 dated 06.03.2024 constituted the Research Advisory Committee for ICAR- CIPHET, Ludhiana for a period of three years w.e.f. 20.02.2024 to 19.02.2027. The second meeting of the Research Advisory Committee (RAC) was held during February 13-15, 2025, at ICAR-CIPHET, Ludhiana. This meeting was conducted in a hybrid format, allowing for both online participation and physical presence of members. All Heads, Project Coordinators, and Scientists of the institute attended the meeting along with the Chairman and other RAC members.

Research Advisory Committee

Dr. R.C. Maheshwari Former Vice-Chancellor, Sardarkrushinager Dantiwada Agricultural University (SDAU), District Banaskantha- 385506 (Gujarat)	Chairman
Dr. Sirshendu De Professor, Chemical Engineering, IIT, Kharagpur	Member
Dr. R.K. Pal Former Director, ICAR-NRCP (Solapur)	Member
Dr. Kalpana Rayaguru Professor and Head Department of Agricultural Processing and Food Engineering CAET, OUAT, Bhubaneswar	Member
Dr. P.S. Rao Professor, Agricultural & Food Engineering Indian Institute of Technology (IIT), Kharagpur	Member
Dr. P.K. Nema Professor, Food Engineering NIFTEM, 97, Niftem Rd, Haryana 131028	Member
Dr. K. Narsaiah ADG (PE), Division of Agricultural Engineering, ICAR, KAB II, Pusa, New Delhi – 110 012	Member
Sh. Kuldip Singh Dhaliwal Flat No. 1, Gurukul Campus, Bathinda Road, Kotakpura -151 201 (Punjab)	Member
Dr. Jaipal Village Assan Khurd, Post Assan Kalan Panipat	Member
Dr. Nachiket Kotwaliwale Director, ICAR-CIPHET, Ludhiana - 141004	Member
Dr. Dhritiman Saha Sr. Scientist and OIC PME Cell, ICAR-CIPHET, Ludhiana	Member Secretary

Institute Research Council (IRC) Meeting

The 36th Institute Research Council Meeting of the ICAR-Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana, was convened on May 15-19, 2025 and mini IRC held on September 11, 2025 at the institute premises. Dr. Nachiket Kotwaliwale, Director of ICAR-CIPHET and Chairman of the Indian Research Council (IRC), presided over the meeting.

Institute Management Committee Meeting

The 39th Institute Management Committee meeting of ICAR-CIPHET, Ludhiana, was held on September 23, 2025, through online & offline mode under the chairmanship of Dr. Nachiket Kotwaliwale, Director of the institute. The meeting reviewed the action taken report of the previous committee meeting and expressed satisfaction with the institute's research achievements, infrastructure development, and financial progress. The committee thoroughly considered most of the proposed agenda items and made corresponding recommendations.

PERSONALIA

Appointment/ Recruitment/ New Joining

Name of the Official	Date of Joining	Designation
Dr. Shubham Rohila	07 July 2025	Scientist
Dr. Sawant Sanket Ramnath	07 July 2025	Scientist
Dr. Mahangade Priyanka Sharad	07 July 2025	Scientist
Dr. Bhawna Kaliraman	27 Oct 2025	Scientist

Superannuation

Name of the Official	Date of Retirement	Designation
Sh. Rajesh	30 Sept 2025	Assistant Chief Technical Officer

Transfer

Name of the Official	Date of Transfer	Designation
Sh. Harender Singh Dahiya	27 Nov 2025	SMS (Agronomy)

Institutional Staff – Ludhiana Campus

Scientific Staff

Name of the Official	Designation	Discipline
Dr. Nachiket Kotwaliwale	Director	Agricultural Structures & Process Engineering
Dr. Rajesh Kumar Vishwakarma	PC, PHET	Agricultural Structures & Process Engineering
Dr. Sandeep Mann	Head, AS&EC Division	Agricultural Structures & Process Engineering
Dr. Ranjeet Singh	Head, ToT Division	Agricultural Structures & Process Engineering
Dr. Rakesh Sharda	PC, PEASEM	Soil & Water Engineering
Dr. Sanjeev Kumar Tyagi	Head (Act.) FG&OP	Chemical Engineering
Dr. Dhritiman Saha	Head (Act.) AST	Agricultural Process Engineering
Dr. Manju Bala	Principal Scientist	Plant Biochemistry
Dr. Ramesh Chand Kasana	Principal Scientist	Agricultural Microbiology
Dr. Rahul Kumar Anurag	Senior Scientist	Food & Science Technology
Dr. Deepika Goswami	Senior Scientist	Food & Science Technology
Dr. (Smt.) Swati Sethi	Senior Scientist	Food Technology
Dr. (Smt.) Leena Kumari	Senior Scientist	Electronic Instrumental
Dr. Surya	Senior Scientist	Agricultural Microbiology
Dr. Chandan Solanki	Senior Scientist	Agricultural Process Engineering
Dr. Indore Navnath Sakharam	Senior Scientist	Agricultural Structures & Environment Engineering
Dr. Kalnar Yogesh	Senior Scientist	Agricultural Process Engineering
Dr. Khwairakpam Bembem	Senior Scientist	Home Science
Dr. Renu Balakrishnan	Senior Scientist	Agricultural Extension
Dr. Pankaj Kumar	Senior Scientist	Agricultural Process Engineering
Dr. Maharishi Tomar	Senior Scientist	Plant Biochemistry
Dr. Sujata Sethy	Senior Scientist	Home Science

Name of the Official	Designation	Discipline
Dr. Rahul Subhash Yadav	Senior Scientist	Agricultural Structures & Process Engineering
Dr. Yogesh Kumar	Senior Scientist	Livestock Products Technology
Dr. Akhoon Asrar Bashir	Scientist	Agricultural Structures & Environment Engineering
Dr. Vikas Kumar	Scientist	Fish Process Technology
Dr. (Smt.) Poonam	Scientist	Plant Biochemistry
Dr. Guru P.N.	Scientist	Agricultural Entomology
Dr. Dawange Sandeep Popatrao	Scientist	Agricultural Process Engineering
Dr. Thingujam Bidyalakshmi	Scientist	Agricultural Process Engineering
Er. Thongam Sunita Devi	Scientist	Agricultural Structures & Process Engineering
Dr. Shaghaf Kaukab	Scientist	Agricultural Structures & Process Engineering
Dr. Ravi Prakash	Scientist	Agricultural Structures & Process Engineering
Smt. Soumya Shubhashree Mohapatra	Scientist	Agricultural Economics
Dr. Urhe Sumit Bhausahib	Scientist	Agricultural Structures & Process Engineering
Dr. Shrikrishna Shrinivas Nishani	Scientist	Agricultural Structures & Process Engineering
Dr. Abhinav Dubey	Scientist	Agricultural Structures & Process Engineering
Smt. Ritu Bharat Kukde	Scientist	Agricultural Structures & Process Engineering
Dr. Sawant Sanket Ramnath	Scientist	Agricultural Structures & Process Engineering
Dr. Shubham Rohila	Scientist	Food Technology
Dr. Bhawna	Scientist	Electronics & Instrumentation

Administrative Staff

Name	Designation
Sh. Parmod Sharma	Finance & Account Officer
Sh. Ram Chand	Principal Private Secretary
Ms. Anuradha	Administrative Officer
Sh. Kunwar Singh	Assistant Administrative Officer
Sh. Avtar Singh	Assistant Administrative Officer
Sh. Tarsem Singh Purba	Assistant Administrative Officer
Sh. Mohit Sikka	Assistant Finance & Account Officer
Sh. Pardeep Kulhari	Assistant Finance & Account Officer
Smt. Jasvir Kaur	Assistant
Sh. Gurdial Singh	Assistant
Sh. Ashwani Kumar	Assistant
Sh. Iqbal Singh	Assistant
Sh. Rajinder Kumar Raheja	Assistant
Sh. Anuj Chhabra	Assistant
Ms. Muskan	Assistant
Smt. Sunita Rana	Upper Division Clerk
Sh. Ram Khelawan Yadav	Upper Division Clerk
Sh. Sanjay Kumar Gaur	Upper Division Clerk
Sh. Ajay Kumar	Upper Division Clerk

Technical Staff

Name	Designation
Sh. Vishal Kumar	Senior Technical Officer (DEO)
Sh. Beant Singh	Technical Officer (Driver)
Dr. Rajiv Sharma	Technical Officer (Lab. Technician)
Sh. Lakhwinder Singh	Technical Officer (Fitter)
Sh. Jaswant Singh	Technical Officer (Welder)
Sh. Hardeep Singh	Technical Officer (Turner)
Smt. Sonia Rani	Technical Officer (DEO)
Sh. Jagtar Singh	Technical Officer (Electrician)
Sh. Pradip Kumar	Senior Technical Assistant (Field Assistant)
Sh. Yashpal Singh	Senior Technical Assistant (Field Assistant)
Sh. Sukhwinder Singh Sekhon	Senior Technical Assistant (Workshop)
Sh. Manoj Kumar	Technician (Lab. Technician)
Sh. Anupam Kumar Choudhary	Technician (T-1)
Sh. Gautam Kumar	Technician (T-1)

Supporting Staff

Name	Designation
Sh. Sukhbir	Skilled Support Staff

Institutional Staff – Abohar Campus

Scientific Staff

Name of the Official	Designation	Discipline
Dr. Amit Nath	Head	Food Science and Technology
Dr. Ramesh Kumar	Pr. Scientist	Horticulture
Sh. Mahesh Kumar Samota	Scientist	Plant Biochemistry
Dr. Shilpa Selvan	Scientist	Agricultural Structures & Process Engineering

Administrative Staff

Name	Designation
Sh. Mohan Lal	Assistant

Technical Staff

Name	Designation
Sh. Prithvi Raj	Assistant Chief Technical Officer (Field Farm.)
Sh. Ganpat Ram	Technical Officer (Driver)
Sh. Devinder Kumar	Technical Officer (Fitter)
Sh. Dalu Ram	Technical Officer (Fitter)
Sh. Pawan Kumar	Technical Officer (Electrician)

Supporting Staff

Name	Designation
Sh. Surinder Kumar	Skilled Support Staff

Institutional Staff – KVK Fazilka

Scientific Staff

Name of the Official	Designation	Discipline
Dr. Arvind Kumar Ahlawat	Senior Scientist-cum-Head	Agricultural Botany
Dr. Rupender Kaur	SMS (ACTO)	Home Science
Sh. Ramesh Chand Kantwa	SMS/T-6	Fruit Science
Sh. Prakash Chand Gurjar	SMS/T-6	Soil Science
Dr. Kishan Kumar Patel	SMS/T-6	Farm Machinery and Power

ICAR-CIPHET in News (few clips)

ਵੱਖ-ਵੱਖ ਥਾਵਾਂ 'ਤੇ ਕਿਸਾਨ ਜਾਗਰੂਕਤਾ ਕੈਂਪ ਲਗਾਏ ਗਏ

ਪਿੰਡਾਂ 'ਚ ਕਿਸਾਨ ਜਾਗਰੂਕਤਾ ਕੈਂਪ ਲਗਾਏ

ਵਿਕਸਿਤ ਕ੍ਰਿਸ਼ੀ ਸੰਕਲਪ ਅਭਿਆਨ ਤਹਿਤ ਪਿੰਡ ਚੜਿੱਕ ਵਿਖੇ ਲਾਇਆ ਜਾਗਰੂਕਤਾ ਕੈਂਪ

ਖੇਤੀਬਾੜੀ ਖੋਜ ਵਿਗਿਆਨ ਟੀਮ ਵੱਲੋਂ ਵਿਕਸਿਤ ਕ੍ਰਿਸ਼ੀ ਅਭਿਆਨ ਤਹਿਤ ਜਾਗਰੂਕਤ ਕੈਂਪਾਂ

ਪਿੰਡ ਚੂਹੜ ਚੱਕ, ਕੋਕਰੀ ਹੇਰਾਂ ਤੇ ਕੋਕਰੀ ਕਲਾਂ 'ਚ ਕਿਸਾਨ ਜਾਗਰੂਕਤਾ ਕੈਂਪ ਲਗਾਏ

ਹੱਕ ਸੱਚ ਦਾ ਪਹਿਰੇਦਾਰ

ਖੇਤੀਬਾੜੀ ਖੋਜ ਵਿੰਗ ਟੀਮ ਵੱਲੋਂ ਵਿਕਸਿਤ ਕ੍ਰਿਸ਼ੀ ਅਭਿਆਨ ਤਹਿਤ ਜਾਗਰੂਕਤ ਕੈਂਪਾਂ ਦਾ ਆਯੋਜਨ

ICAR- CIPHET, Ludhiana organised One-Day Awareness cum Training Programme

ਵਰਮੀਕੰਪੋਸਟ ਦੀ ਵਿਧੀ ਬਾਰੇ ਦੱਸਿਆ

From Harvest to Higher Income: ICAR-CIPHET trains 100 Farmers in 3 Days

ਪਰਾਲੀ ਪ੍ਰਬੰਧਨ ਪਰ ਜਾਗਰੂਕਤਾ ਕਾਰਯਕ੍ਰਮ ਕਰਵਾਯਾ

ਅਨੁਸੂਚਿਤ ਜਾਤਿ ਕੀ ਮਹਿਲਾਓਂ ਕੋ ਸਮ੍ਰੁਦ੍ਧ ਬਨ ਕੇ ਲਿਏ 5 ਦਿਵਸੀਯ ਪ੍ਰਸ਼ਿਕ੍ਸ਼ਣ ਕਾਰ੍ਯਕ੍ਰਮ ਕਰਵ

ਮੁਖ੍ਯ ਕ੍ਰਿਸ਼ਿ ਅਧਿਕਾਰੀ ਨੇ ਕਿਯਾ ਕ੍ਰਿਸ਼ਿ ਵਿਜ੍ਞਾਨ ਕੇਂਦ੍ਰ

सीफेट अबोहर में हर्षोल्लास के साथ मनाया स्वतंत्रता दिवस

ध्वजारोहण करते सीफेट कर्मचारी।

सवेरा न्यूज/कथूरिया

अबोहर, 16 अगस्त : क्षेत्रीय केन्द्र सीफेट अबोहर में विभिन्न कार्यक्रमों के साथ धूमधाम से स्वतंत्रता दिवस मनाया गया। इस अवसर पर डॉ अमित नाथ, प्रभागाध्य क्षेत्रीय केन्द्र सीफेट द्वारा ध्वजारोहण कर सभी अधिकारीयों एवम कर्मचारियों को स्वतंत्रता दिवस की बधाई दी। इस अवसर में विभिन्न खेल कूद प्रतियोगिता जैसे वॉलीबाल, बैटमिंटन, कुर्सी दौड़ और लेमन रेस इत्यादि का आयोजन किया गया। जिसमे सभी अधिकारियों कर्मचारियों एवं परिसर के बच्चों ने बढ़ चढ़ कर भाग लिया। इस उपलक्ष्य पर डॉ अरविंद अहलावत हैड कृषि विज्ञान केंद्र सीफेट अबोहर ने उपस्थित सभी अधिकारियों व कर्मचारियों का उत्साह वर्धन किया तथा डॉ महेश ने का धन्यवाद कि संचालन डॉ शि

दानक सवेरा टाइम्स

कृषि विज्ञान केंद्र सीफेट ने फसल दिवस

नी दिखाते हुए सीफेट अधिकारी।

ा न्यूज/कथूरिया अबोहर : केवीके व सीफेट द्वारा बहाव मूह अग्रिम पंक्ति परियोजना के तहत सरसों फसल पर लगाए ने के लिए फसल दिवस का आयोजन किया गया। इस न पृथ्वीराज द्वारा कृषि विज्ञान केंद्र के हेड डा. अरविंद कुम नदीप सिंह किसान के खेत में किया गया। इस किसान के य ी आरएच 725 लगवाई गई है जिसका प्रदर्शन अन्य कि ा गया तथा सभी किसानों ने इस किस्म की सराहना की। रविंद कुमार द्वारा कृषि विज्ञान केंद्र की गतिविधियों एवं किसानों को अवगत करवाया। पृथ्वीराज द्वारा इस परियो जगह लगाए गए प्रदर्शनों की जानकारी किसानों को दी।

कृषि में संरक्षित खेती के महत्व दिवसीय प्रशिक्षण कार्यक्रम कर

किसानों को प्रमाण पत्र देते अधिकारी।

सवेरा न्यूज/कथूरिया

अबोहर, 30 अगस्त : सीफेट अबोहर में ए.आई.सी.आर.पी. पर प्लास्टिक इंजीनियरिंग इन एग्रीकल्चर स्ट्रक्चर एंड एनवायरनमेंट मैनेजमेंट के तहत कृषि में संरक्षित खेती के महत्व पर तीन दिवसीय प्रशिक्षण कार्यक्रम आयोजित किया गया जिसमे फाजिल्का जिले के 20 किसानों ने उत्साहपूर्वक भाग लिया। इस पहल का नेतृत्व सम्मानित निदेशक डॉ. चंचिकेत कोतवाली वाले ने किया। जिन्होंने फाजिल्का के किसानों के बीच संरक्षित खेती के बारे में जागरूकता फैलाने में महत्वपूर्ण भूमिका निभाई। इस कार्यक्रम का संचालन प्लास्टिक इंजीनियरिंग इन एग्रीकल्चर स्ट्रक्चर एंड एनवायरनमेंट मैनेजमेंट की परियोजना प्रभारी और सीफेट की वैज्ञानिक डॉ. शिल्पा एस.सेल्वन ने किया। जिसमें सीफेट अबोहर के क्षेत्रीय केंद्र के प्रमुख व्याख्यान प्रस्तुत किए। इस कार्यक्रम को निर्यातित वातावरण में फल अनुकूलित करने के लिए आव व्यावहारिक कौशल प्रदान करना था के मुख्य कृषि अधिकारी डॉ.संदीप भाग लिया और किसानों के साथ ज्ञविज्ञान केंद्र फाजिल्का द्वारा समूह इसके अलावा दो विशेषज्ञ डॉ. रकॉलेज प्रबंधन समिति के सहयोग से प्रधान वैज्ञानिक, सब्जी प्रजनन (स्थानीय गुरु नानक खालसा कॉलेज हर्षवर्धन चौधरी वरिष्ठ वैज्ञानिकअबोहर में चलाया जा रहा पांच (खरबूजा) को दिल्ली से आमंत्रितदिवसीय कृषि प्रशिक्षण कार्यक्रम आज विषयों में पॉलीहाउस और ग्रीनहाउप्रभावी ढंग से संपन्न हो गया। प्रशिक्षण उपयोग, मल्चिंग के लाभ और तकनीकार्यक्रम के अंतिम दिन के मुख्य सिंचाई की प्रभावी पद्धतियां शामिलअतिथि डॉ.अरविन्द कुमार इस प्रकार तैयार किया गया था कि अहलावत ने बोलते हुए कहा कि संरक्षित खेती की विधियों के माध्य अच्छी खेती मध्यम व्यापार वाली गुणवत्ता, उपज और स्थिरता को पुरानी कहावत को पुनर्जीवित करने व्यापक समझ प्रदान कर सके। इस की सख्त जरूरत है। उन्होंने कृषि को कृषि समुदाय की सक्रिय भागीदारी समय के अनुरूप बनाने की सफल बनाया गया। वह पहल त आवश्यकता पर बल देते हुए कहा अबोहर की ग्रामीण किसानों के उत्

खेती क्षेत्र में लगातार घट रहे मुनाफे को बढ़ाया जा सकता है

सवेरा न्यूज/कथूरिया

अबोहर, 13 सितम्बर : कृषि विज्ञान केंद्र फाजिल्का द्वारा समूह के अलावा दो विशेषज्ञ डॉ. रकॉलेज प्रबंधन समिति के सहयोग से प्रधान वैज्ञानिक, सब्जी प्रजनन (स्थानीय गुरु नानक खालसा कॉलेज हर्षवर्धन चौधरी वरिष्ठ वैज्ञानिकअबोहर में चलाया जा रहा पांच (खरबूजा) को दिल्ली से आमंत्रितदिवसीय कृषि प्रशिक्षण कार्यक्रम आज विषयों में पॉलीहाउस और ग्रीनहाउप्रभावी ढंग से संपन्न हो गया। प्रशिक्षण उपयोग, मल्चिंग के लाभ और तकनीकार्यक्रम के अंतिम दिन के मुख्य सिंचाई की प्रभावी पद्धतियां शामिलअतिथि डॉ.अरविन्द कुमार इस प्रकार तैयार किया गया था कि अहलावत ने बोलते हुए कहा कि संरक्षित खेती की विधियों के माध्य अच्छी खेती मध्यम व्यापार वाली गुणवत्ता, उपज और स्थिरता को पुरानी कहावत को पुनर्जीवित करने व्यापक समझ प्रदान कर सके। इस की सख्त जरूरत है। उन्होंने कृषि को कृषि समुदाय की सक्रिय भागीदारी समय के अनुरूप बनाने की सफल बनाया गया। वह पहल त आवश्यकता पर बल देते हुए कहा अबोहर की ग्रामीण किसानों के उत्

दैनिक सवेरा टाइम्स

केवीके/सीफेट की ओर से फसल दिवस मनाया

सीफेट/केवीके के अधिकारी व किसान।

सवेरा न्यूज/धर्मवीर अबोहर : कृषि विज्ञान केंद्र सीफेट अबोहर द्वारा रायपुरा गांव में समूह अग्रिम पंक्ति परियोजना के तहत सरसों फसल पर लगाए गए प्रदर्शन दिखाने के लिए फसल दिवस का आयोजन किया गया। इस कार्यक्रम का संचालन पृथ्वीराज द्वारा कृषि विज्ञान केंद्र के हेड डा. अरविंद कुमार के निर्देशन में सुशील कुमार किसान के खेत में किया गया। किसान के यहां सरसों की वैरायटी आर एच 725 लगवाई गई है जिसका प्रदर्शन अन्य किसानों को भी दिखाया गया तथा सभी किसानों ने इस किस्म की सराहना की। इस मौके पर डा. अरविंद कुमार द्वारा कृषि विज्ञान केंद्र की गतिविधियों एवं कार्यक्रमों के बारे में किसानों को अवगत करवाया। पृथ्वीराज द्वारा इस परियोजना के तहत जगह-जगह पर लगाए गए प्रदर्शनों की जानकारी किसानों को दी। रूपेंद्र कौर द्वारा स्वास्थ्य सुरक्षा एवं पोषण के बारे में जानकारी दी गई। इस कार्यक्रम में कुल 42 किसानों ने भाग लेकर कार्यक्रम को सफल बनाया।

पराली प्रबंधन पर प्रशिक्षण कार्यक्रम का समा

सवेरा न्यूज/कथूरिया अबोहर, 4 सितम्बर : कृषि विज्ञान केंद्र अबोहर द्वारा पराली प्रबंधन पर तीन दिवसीय प्रशिक्षण कार्यक्रम का आ किया गया। इस कार्यक्रम के तहत कृषि विज्ञान केंद्र के हेड डॉक्टर अ कुमार अहलावत द्वारा किसानों को पराली प्रबंधन करते हुए आसपा वातावरण एवं मानव स्वास्थ्य में सुधार के लिए आग्रह किया। कृषि वि केंद्र के वैज्ञानिकों द्वारा मृदा स्वास्थ्य, पराली सम्बन्धी मशीनरी पराली से वाली कंपोस्ट तथा विभिन्न सहायक उद्योगों के बारे में विस्तृत जानकारी साथ ही साथ किसानों को पराली से बनने वाली खाद के प्लांट का भ्रमण करवाया गया तथा पराली प्रबंधन करने के बाद खेत में होने वाली विभि समस्याओं के समाधान भी बताए गए। इस कार्यक्रम में 30 किसानों ने लेकर कार्यक्रम को सफल बनाया। सीफेट अबोहर के क्षेत्रीय केंद्र के डॉक्टर अमित नाथ द्वारा प्रतिभागियों को प्रमाण पत्र वितरित किए गये।

एमश्री केन्द्रीय विद्यालय के विद्यार्थियों ने किया सीफेट का भ्रमण

वेरा न्यूज/कथूरिया

बोहर, 7 अक्टूबर : एमश्री केंद्रीय विद्यालय बोहर के विद्यार्थी ने मृदा रीक्षण के लिए राष्ट्रीय कृषि अनुसंधान सीफेट बोहर का भ्रमण किया। स भ्रमण में कक्षा 10वीं क सभी विद्यार्थियों और कक्षा 11वीं और 12वीं के जीव विज्ञान के विद्यार्थियों ने भाग लिया। प्राचार्य करमजीत सिंह ने ने विद्यार्थियों को मृदा परीक्षण किट देकर विद्यालय से रवाना किया राष्ट्रीय कृषि अनुसंधान सीफेट अबोहर के प्रोफेसर डॉ. प्रकाश चं

कृषि विकास केंद्र का भ्रमण करते हुए छात्र।

दानक सवेरा टाइम्स

केवीके ने पराली प्रबंधन पर जागरूकता कार्यक्रम करवाया

कार्यक्रम में हिस्सा लेते हुए केवीके अधिकारी व किसान।

सवेरा न्यूज/कथूरिया

अबोहर, 4 नवंबर: केवीके द्वारा अरनीवाला ब्लॉक के ग्राम अलियाना में फसल अवशेष प्रबंधन पर एक दिवसीय ब्लॉक स्तरीय जागरूकता कार्यक्रम आयोजित किया गया।

इस कार्यक्रम संयोजन केवीके प्रमुख डॉ. अरविंद कुमार अहलावत के नेतृत्व में डॉ. किशन पटेल एसएमएस, डॉ. प्रकाश चंद गुर्जर एसएमएस व पृथ्वीराज एसीटीओ ने गांव के सरपंच महेंदर सिंह तथा गांव के समस्त किसानों के सहयोग से किया। कार्यक्रम के दौरान केवीके के अवशेष प्रबंधन के लिए तकनीकी जानकारी दी गई और किसानों से पराली जलाने से होने वाले खतरनाक दुष्प्रभावों को बताते हुए पराली न जलाने की अपील की गई।

कार्यक्रम में विशेषज्ञ के रूप में डॉ. जगदीश अरोरा ने किसानों को फसल अवशेष प्रबंधन के पश्चात होने वाले विभिन्न बीमारियों के बारे में बताते हुए पराली का उपयोग बागों में मल्च के रूप में करने की बात कही। इस कार्यक्रम में अरनीवाला ब्लॉक के 100 से अधिक किसानों

जालंधर, रविवार, 22 सितम्बर 2

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क खेती एक अभ्यास और प्रमाणीकरण पर 5 दिवसीय प्रशिक्षण कार्यक्रम

तभागी को सम्मानित करते हुए आयोजक।

वेरा न्यूज/कथूरिया

बोहर, 21 सितंबर : कृषि विज्ञान न्द्र अबोहर द्वारा जैविक खेती एक भ्यास और प्रमाणीकरण पर 5 दिवसीय प्रशिक्षण कार्यक्रम का समापन किया गया। यह प्रशिक्षण कार्यक्रम डॉ मित नाथ, प्रभारी सीफेट व डॉ रविंद कुमार अहलावत प्रभारी, कृषि

गुर्जर एवं हरेंद्र सिंह दहिया द्वारा किया गया। इस कार्यक्रम में डॉ रूपेंद्र कौर, राजेश कुमार, पृथ्वीराज, डॉ रमेश चंद कटवा, डॉ किशन कुमार पटेल, डॉ. नवदीप गोयल असिस्टेंट प्रोफेसर, वीरेंद्र सिंह, अमृतपाल कौर अन्य कर्मचारी भी उपस्थित रहे। इस कार्यक्रम में 75 विद्यार्थी प्रतिभागियों ने भाग लेकर। कार्यक्रम को सफल बनाया। इस

मशीनों की जांच करते अधिकारी।

केवीके ने किया कस्टम हायरिंग सैंटर्स का सर्वेक्षण

सवेरा न्यूज/कथूरिया

अबोहर, 31 अगस्त : कृषि विज्ञान केंद्र (केवीके) के डा. किशन पटेल एसएमएस (कृषि मशीनरी) और पृथ्वीराज के साथ मिलकर क्षेत्र में कस्टम हायरिंग सेंटर्स (कृषि मशीनों का किराया केंद्र) का सर्वेक्षण किया। सर्वेक्षण का उद्देश्य किसानों और ग्रामीण समुदायों के लिए कृषि मशीनों निजी फर्म आदि का दौरा किया और मालिकों और ग्राहकों के साथ बातचीत की। उन्होंने उपलब्ध कृषि मशीनों के प्रकार, किराया शुल्क, मशीनों से होने वाले लाभ-हानि और प्रदान की गई सेवाओं की गुणवत्ता के बारे में आंकड़े एकत्र किए। सर्वेक्षण के निष्कर्षों का उपयोग कस्टम हायरिंग सेंटर्स और स्व सहायता समूह आदि द्वारा प्रदान की

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लुधियाना–141004, पंजाब, भारत
ICAR-Central Institute of Post-Harvest Engineering and Technology
Ludhiana-141004, Punjab, India
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