वार्षिक प्रतिवेदन
ANNUAL REPORT
2025

भाकृअनुप-केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान
बैरकपुर, कोलकाता - 700121, पश्चिम बंगाल

ICAR-CENTRAL RESEARCH INSTITUTE FOR JUTE AND ALLIED FIBRES
Barrackpore, Kolkata - 700121, West Bengal

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भा.कृ.अनु.प.- केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान

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Contents

Mandate

- Basic and strategic research on improvement of jute and allied fibre crops for biotic and abiotic stresses, yield and quality
- Development of economically viable and sustainable production technology, cropping systems and post-harvest technology
- Co-ordination and monitoring of applied research on national and regional issues to develop improved varieties and technologies
- Dissemination of technologies and capacity building

Preface

The Central Research Institute for Jute and Allied Fibres (CRIJAF) is a unique and premier institute under the National Agricultural Research System (NARS), spearheading research and development on jute and allied fibre crops since the pre-Independence era. Jute and allied fibre (JAF) crops provide eco-friendly, renewable, and biodegradable materials that support a wide range of industrial and livelihood applications. In the global transition toward a greener and more sustainable future, jute is emerging as a key natural fibre, with its biodegradable properties and growing export demand significantly enhancing its commercial and environmental relevance.

Over the years, CRIJAF has made substantial research advancements in the areas of crop improvement, crop production and crop protection, contributing to the sustainable growth of jute and allied fibre-based farming systems. The Annual Report 2025 of the Institute presents a comprehensive account of these research, development and extension achievements, in alignment with its mandate to enhance productivity, profitability, and sustainability of jute and allied fibre crops in India.

During the reporting period, the Institute continued to pursue excellence in basic, strategic and applied research through its three core thematic domains - Crop Improvement, Crop Production, and Crop Protection. These efforts were supported by effective technology validation and dissemination through the All India Network Project on Jute and Allied Fibres (AINP-JAF) and a wide range of extension and outreach programmes. The Institute's activities were closely aligned with national priorities such as climate resilience, efficient resource use, carbon-smart agriculture, enhancement of farmers' income, ecosystem services, value addition and value chain establishment.

In 2025, the Institute developed high-yielding jute varieties with resistance to premature flowering and suitability for intercropping. Two new varieties JRO-2024 of tossa jute and AMV-11 of mesta (roselle)were released, reflecting their superior performance over existing cultivars. These varieties are characterized by higher fibre yield, improved quality attributes and wider adaptability across diverse agro-ecological conditions. Advances in conventional and molecular breeding, genome editing, haploidy induction, and germplasm conservation further strengthened the genetic resource base of jute and allied fibre crops. The development of advanced molecular tools, including ILP marker resources and databases, has expanded the scope of genomics-assisted breeding in jute.

In crop production, ICAR-CRIJAF advanced soil health, water productivity and climate resilience of jute-based systems through long-term nutrient management experiments, precision irrigation, digital/sensor-based innovations, and carbon footprint assessments positioning jute as a climate-smart crop. Mechanization (seed drills, weeders), post-harvest innovations, and water-efficient retting technologies addressed labour shortages, fibre quality and environmental concerns. The flagship Jute-ICAREprogramme scaled these technologies across major jute-growing regions. Crop protection research delivered resistant germplasm, IPM modules, insecticide resistance insights, and climate-based pest forecasting models, significantly reducing yield losses and pesticide dependency while promoting sustainable plant protection. Technology dissemination through coordinated scientist-farmer-extension efforts generated measurable impacts on productivity, fibre quality, and farm profitability. CRIJAF interventions earned strong support from National Jute Board, Jute Corporation of India, and State Agriculture Departments. Capacity building empowered SHGs in jute handicrafts and value-added products, creating off-farm income opportunities. Scientists actively participated in national/international webinars, seminars and conferences, while high-impact journal publications reinforced the Institute's research leadership.

I extend my heartfelt gratitude to Dr. M. L. Jat, Secretary, DARE, Government of India and Director General, ICAR, for his dynamic leadership and invaluable guidance, which have been a driving force behind our efforts. I also sincerely thank Dr. D. K. Yadava, Deputy Director General (Crop Science), and Dr. P. K. Dash, Assistant Director General (Commercial Crops), ICAR, New Delhi, for their constant encouragement and support. Special recognition is due to the Chairman (RAC) and members of the Research Advisory Committee for their continued motivation and guidance.

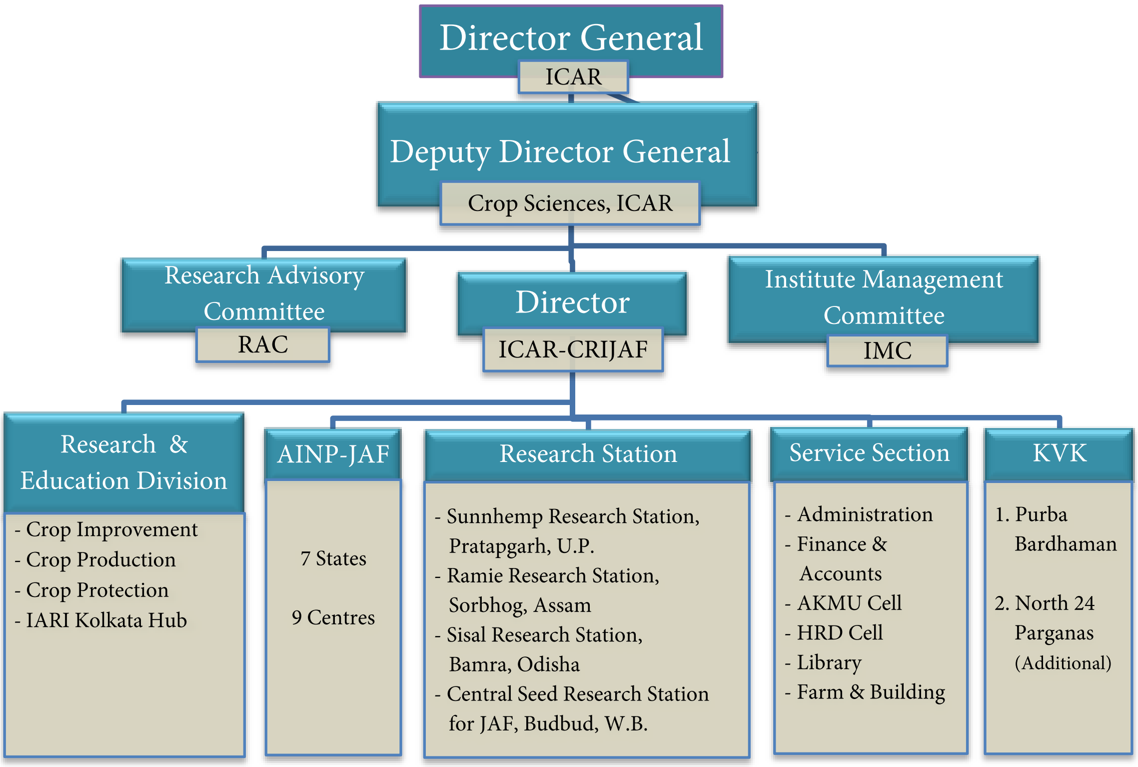
Finally, I appreciate editorial team for timely publication of this Annual Report.

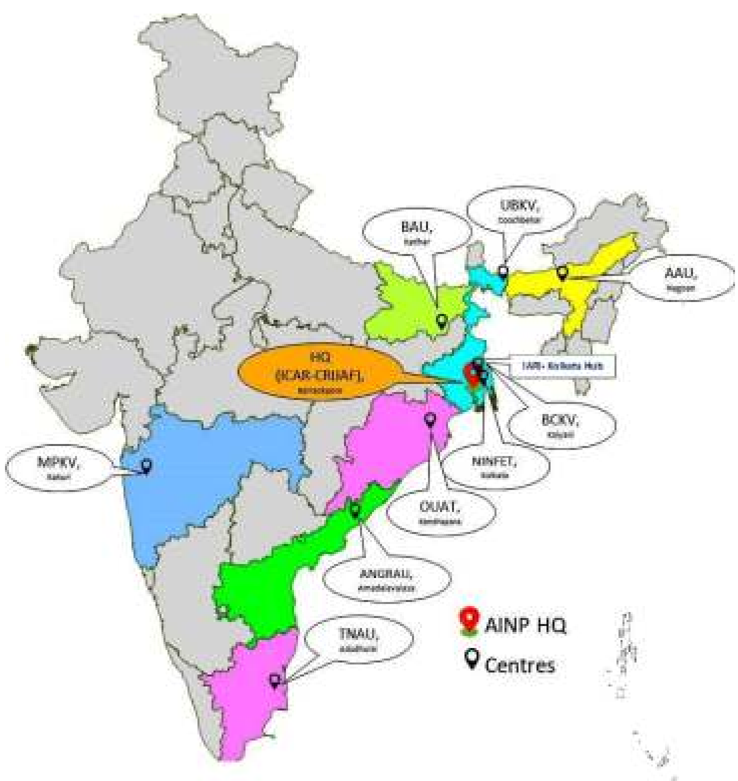
Place: Barrackpore
Date: 31-12-2025

(GourangaKar)
Director, ICAR-CRIJAF

Vision & Mission

ORGANOGRAM OF ICAR-CRIJAF





कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद – केंद्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान (ICAR-CRIJAF) का दायित्व भारत में पटसन एवं समवर्गीय रेशा फसलों के उत्पादन, उत्पादकता और दीर्घकालिक स्थिरता को सुदृढ़ करने हेतु मौलिक, रणनीतिक तथा अनुप्रयुक्त अनुसंधान को योजनाबद्ध, वैज्ञानिक एवं समन्वित ढंग से संपादित करना है।

संस्थान के अनुसंधान कार्यक्रम सुव्यवस्थित रूप से तीन प्रमुख विषयगत क्षेत्रों—फसल सुधार, फसल उत्पादन एवं फसल संरक्षण—पर आधारित हैं। संस्थान द्वारा विकसित उन्नत एवं नवीन प्रौद्योगिकियों का वैज्ञानिक सत्यापन अखिल भारतीय समन्वित अनुसंधान परियोजना (AINP-JAF) के अंतर्गत बहु-स्थलीय परीक्षणों के माध्यम से किया जाता है, जबकि सत्यापित प्रौद्योगिकियों का विस्तार, प्रसार तथा अंगीकरण सुदृढ़ विस्तार एवं जनसंपर्क तंत्र के माध्यम से लक्षित हितधारकों तक सुनिश्चित किया जाता है। वर्ष 2025 के दौरान संस्थान ने अनुसंधान एवं विकास के विविध क्षेत्रों में उल्लेखनीय प्रगति एवं महत्वपूर्ण उपलब्धियाँ प्राप्त कीं तथा सुनियोजित कार्यक्रमों के माध्यम से पटसन एवं समवर्गीय रेशा उत्पादक किसानों के समक्ष उन्नत प्रौद्योगिकियों का प्रदर्शन एवं प्रायोगिक मूल्यांकन किया। इस प्रतिवेदन का कार्यकारी सारांश निम्नवत् प्रस्तुत किया जा रहा है।

फसल सुधार

- तोसा पटसन (*Corchorus olitorius* L.) की एक नवीन एवं उन्नत किस्म 'JRO-2024' को सफलतापूर्वक जारी एवं अधिसूचित किया गया है। इस किस्म की औसत रेशा उपज 32 क्विंटल प्रति हेक्टेयर पाई गई है, जो प्रचलित मानक किस्मों की तुलना में लगभग 7.50 प्रतिशत अधिक है। 'JRO-2024' में प्रारंभिक पुष्पन के प्रति उच्च स्तर का प्रतिरोध विद्यमान है, जिसके फलस्वरूप इसकी उपज स्थिरता एवं उत्पादन क्षमता में उल्लेखनीय वृद्धि होती है। यह किस्म पटसन–मूंग आधारित अंतरफसली प्रणाली के लिए विशेष रूप से उपयुक्त है, जिससे किसानों को अतिरिक्त आय के साथ-साथ फसल विविधीकरण का अवसर प्राप्त होता है। इसके अतिरिक्त, अखिल भारतीय समन्वित अनुसंधान परियोजना–पटसन एवं समवर्गीय रेशा (AINP-JAF) के अंतर्गत संचालित समन्वित परीक्षणों (IVT, AVT) एवं अनुकूलन परीक्षण) के माध्यम से पटसन एवं समवर्गीय रेशा फसलों के कुल 33 जीनोटाइपों का बहु-स्थलीय एवं वैज्ञानिक मूल्यांकन किया जा रहा है, जिसका उद्देश्य उच्च उत्पादक, अनुकूलनशील एवं क्षेत्र-विशिष्ट किस्मों की पहचान एवं अनुशंसा करना है।
- समय से पूर्व पुष्पन (अकाल पुष्पन) के प्रति प्रतिरोधकता के आकलन हेतु 150 जर्मप्लाज्म अभिग्रहणों का व्यवस्थित मूल्यांकन किया गया, जिसमें से सात अभिग्रहणों को उच्च प्रतिरोधी के रूप में मान्यता दी गई। इसके अतिरिक्त, कोर संग्रह की बहु-स्थलीय और लक्षित छँटाई के परिणामस्वरूप चार जर्मप्लाज्म लाइनों में जलभराव (वॉटर-लॉगिंग) तनाव के प्रति सहनशीलता की पुष्टि हुई। इसके अतिरिक्त, नियंत्रित प्रयोगशाला परिस्थितियों में पटसन सेमीलूपर (*Semilooper*) की भक्षण वरीयता, लार्वा विकास अवधि तथा लार्वा उत्तरजीविता का मूल्यांकन करने हेतु 30 जंगली *Corchorus* जर्मप्लाज्म अभिग्रहणों पर अध्ययन किया गया, जिनमें *C. tridens, C. aestuans* और *C. pseudo-olitorius* के दस-दस अभिग्रहण शामिल थे। संवेदनशील नियंत्रण के रूप में संवर्धित पटसन किस्म *C. olitorius* (JRO-204) का उपयोग किया गया। अध्ययन के निष्कर्षों से यह स्पष्ट हुआ कि *C. tridens* और *C. aestuans* की दो-दो जीनोटाइपों में उच्च स्तर की सहनशीलता पाई गई, जबकि *C. pseudo-olitorius* का एक जीनोटाइप अत्यधिक संवेदनशील पाया गया। चिन्हित इन पाँच चयनित जर्मप्लाज्म लाइनों को आगे पंजीकरण प्रक्रिया हेतु संसाधित किया गया है।
- वर्तमान में भा.कृ.अ.प. – केंद्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान में पटसन एवं समवर्गीय रेशा फसलों के कुल 5,914 जर्मप्लाज्म अभिग्रहणों का दीर्घकालिक संरक्षण और प्रबंधन किया जा रहा है। साथ ही, नवंबर 2024 से अक्टूबर 2025 की अवधि के दौरान अनुसंधान एवं प्रजनन कार्यक्रमों को सुदृढ़ करने के लिए 2,529 पटसन एवं

समवर्गीय रेशा जर्मप्लाज्म अभिग्रहणों का वितरण संस्था के वैज्ञानिकों तथा अन्य अधिकृत शोधकर्ताओं/आवेदकों को किया गया।

- पटसन (*C. olitorius* cv. JRO-524) में रेशा लिग्निन की मात्रा कम करने और अल्प-दिवसीय पुष्पन (early flowering) को रोकने हेतु जीनोम संपादन का प्रयास किया गया। इसके तहत लिग्निन जैवसंश्लेषण मार्ग के प्रमुख जीन Coumarate-3-hydroxylase (C3H) को लक्षित किया गया, जबकि Flowering locus T (FT) जीन को पुष्पन समय नियंत्रण के लिए संपादन का लक्ष्य बनाया गया। दोनों जीनों के विभिन्न आइसोफॉर्म का सावधानीपूर्वक विश्लेषण करने के उपरांत, सटीक gRNA डिज़ाइन किया गया और उन्हें पादप जीनोम संपादन वेक्टर *pRGEB31* में क्लोन किया गया। रूपांतरण दक्षता का पूर्वानुमान करने के लिए *pCAMBIA1301* वेक्टर में GUS रिपोर्टर जीन संरचना का उपयोग किया गया। तीनों तैयार वेक्टर संरचनाओं को *Agrobacterium tumefaciens (GV3101)* स्ट्रेन में स्थानांतरित कर पादप रूपांतरण (plant transformation) में प्रयोग किया गया। इस प्रक्रिया के माध्यम से संपादित पौधों में लक्षित जीनों के नियोजित परिवर्तन और उनका प्रारंभिक मूल्यांकन संभव हुआ, जिससे रेशा गुणवत्ता सुधार और पुष्पन समय नियंत्रण के लिए संभावित संपादित लाइनें विकसित की जा सकें।

- पटसन में हैप्लॉयडी प्रेरण कार्यक्रम के अंतर्गत, एन्थेसिस के विभिन्न चरणों पर एकत्रित परागकोषों से माइक्रोस्पोर कल्चर के मानकीकरण हेतु विभिन्न माध्यम संयोजनों का मूल्यांकन किया गया। प्रारंभिक प्रयोगों में ज़ीटिन एवं NAA युक्त STTS माध्यम तथा BAP, NAA एवं STS युक्त माध्यम का उपयोग JRO-504, JRO-204 एवं JRC-212 में कैलस प्रेरण के लिए किया गया। BN-STS माध्यम ने JRO-204 एवं JRO-524 में सर्वाधिक प्रभावी प्रतिक्रिया प्रदर्शित की तथा इसे ठोस एवं निलंबन संस्कृतियों में माइक्रोकैलस प्रेरण हेतु अपनाया गया। JRO-524 एवं JRO-204 में लगभग 44 दिनों के पश्चात कैलस निर्माण प्रारंभ हुआ। 21 दिनों के अंतराल पर किए गए उप-संस्करण के उपरांत कुछ कैलसों में आकार वृद्धि देखी गई। लगभग 5–6 उप-संस्करणों के पश्चात हरे कैलस प्राप्त हुए, तथापि शूट पुनर्जनन नहीं हो सका। वर्तमान में, नियंत्रित पादप वृद्धि सुविधा में इन कैलसों से प्राप्त पौधों के सुदृढ़ीकरण (hardening) हेतु प्रयास प्रगति पर हैं।

- WCIN-183A (प्रतिरोधी) × OIN-456 (संवेदनशील) संकरण से प्राप्त 220 F_2 पौधों का जीनोटाइपिंग 30 बहुरूपी *Intron-Linked Polymorphic* (ILP) मार्करों द्वारा किया गया। दो विशिष्ट ILP प्राइमरों के उपयोग से लाइन 52, 64 एवं 66 में प्रतिरोधी अभिभावक के अनुरूप बैंडिंग पैटर्न प्राप्त हुआ। फेनोटाइपिक मूल्यांकन में भी इन रेखाओं ने *Macrophomina phaseolina* के विरुद्ध स्पष्ट प्रतिरोध प्रदर्शित किया।

- पटसन (*Corchorus spp.*) के लिए एक सुदृढ़ आणविक मार्कर संसाधन स्थापित करने हेतु ILP_Miner नामक GUI-आधारित सॉफ्टवेयर विकसित किया गया। जो जीनोम और एनोटेशन डेटा का उपयोग करके ILP (Intron Length Polymorphism) मार्कर की पहचान को स्वचालित करता है और प्रत्येक इंट्रॉन के लिए उपयुक्त प्राइमर युग्म का स्वतः निर्माण करता है। इस उपकरण के माध्यम से, *C. capsularis* में 1,23,568 तथा *C. olitorius* में 1,12,729 ILP मार्कर पहचाने गए, जो जीनोम में व्यापक इंट्रॉनिक विविधता का संकेत देते हैं। इनमें से चयनित 150 ILP मार्कर का संश्लेषण कर उनकी प्रवर्धन क्षमता (amplifiability) और बहुरूपता (polymorphism) का प्रयोगात्मक सत्यापन किया गया। दीर्घकालिक उपयोग और अनुसंधान के लिए 'पटसन ILP मार्कर डेटाबेस' विकसित किया गया, जिसमें प्रत्येक मार्कर की जीनोमिक स्थिति, प्राइमर अनुक्रम, एलील जानकारी और संबंधित एनोटेशन विवरण संचित हैं। यह डेटाबेस पटसन के लिए प्रथम बड़े पैमाने का ILP मार्कर भंडार है और जीनोमिक विविधता विश्लेषण, किस्म संवेदनशीलता, QTL मानचित्रण और प्रजनन कार्यक्रमों में अत्यंत उपयोगी साधन सिद्ध होगा।

- फ्लैक्स प्रजनन कार्यक्रम में , वंशावली विधि (pedigree method) द्वारा विकसित लाइनो का F_7 अवस्था में स्टेशन परीक्षण किया गया। परीक्षण के परिणामस्वरूप छह चयनित लाइनो में से JRFJ-2025-4, JRFJ-2025-1 और JRFJ-2025-5 को मानक नियंत्रण लाइन की तुलना में श्रेष्ठ पाया गया। इन तीन लाइनो को AINP-JAF IVT (रबी 2025-26) हेतु नामांकित किया गया। इसी प्रकार, उत्परिवर्तन प्रजनन से विकसित लाइनो का M_8 अवस्था में

मूल्यांकन किया गया। चयनित छह लाइनो में से JRFJ-M5, JRFJM2 और JRFJM4 को मानक लाइन JRF-2 से श्रेष्ठ पाया गया और इन्हें AINP-JAF IVT (रबी 2025-26) में नामांकित किया गया।

- SS-2 × JRO-524 संकरण से प्राप्त F_2 आबादी में पेक्टिन सामग्री का विश्लेषण किया गया, जिसमें यह पाया गया कि पेक्टिन प्रतिशत 0.5% से 3.5% तक विस्तृत और सतत रूप से वितरित था। यह वितरण इस लक्षण के मात्रात्मक (quantitative) और बहु-जीन (polygenic) नियंत्रित होने का संकेत देता है। अधिकांश पौधे 2.0–2.5% पेक्टिन के आसपास केंद्रित रहे, जो बहु-जीन लक्षणों की सामान्य वितरण प्रवृत्ति (normal distribution pattern) को दर्शाता है। यह अध्ययन F_2 आबादी में पेक्टिन सामग्री के बहु-जीन नियंत्रित, मात्रात्मक लक्षण स्वरूप को स्पष्ट करता है और ट्रांसग्रेसिव सेग्रीगेशन के माध्यम से उच्च और निम्न पेक्टिन वाले पौधों की संभावित चयन की दिशा सुझाता है, जो प्रजनन और उन्नत किस्म विकास के लिए उपयोगी होगी।
- वर्ष 2024-25 की खरीफ फसल के लिए 9.25 क्विंटल कुल मांग के सापेक्ष 14.37 क्विंटल पटसन, मेस्ता और सनई के प्रजनक बीज का उत्पादन किया गया, जिससे मांग की तुलना में अधिक आपूर्ति सुनिश्चित हुई। साथ ही, वर्ष 2024-25 की रबी फसल में 4.5 क्विंटल फ्लैक्स प्रजनक बीज का उत्पादन संपन्न हुआ। इसके अतिरिक्त, धान, सरसों, गेहूँ, पटसन, मूंग, सनई, ढैंचा और फ्लैक्स सहित विविध फसलों का लगभग 93 टन प्रमाणित एवं सत्यापित (TL) बीज उत्पादन किया गया, जो किसानों और अनुसंधान संस्थानों तक उच्च गुणवत्ता वाले बीज की उपलब्धता सुनिश्चित करता है।
- दो किस्में — JROB-2 (टॉसा पटसन) एवं JRCJ-11 (सफेद पटसन) —का पौधा किस्म संरक्षण एवं कृषक अधिकार प्राधिकरण (PPV&FRA) में पंजीकरण किया गया। इसके अतिरिक्त, JROBA-3 (टॉसा पटसन) एवं JRCP-5 (सफेद पटसन) की DUS परीक्षण की द्वितीय चक्र प्रक्रिया सफलतापूर्वक पूर्ण की गई।

फसल उत्पादन

मृदा एवं जल उत्पादकता, जलवायु-सहिष्णु पटसन-आधारित प्रणालियाँ, फसल एवं कटाई-पश्चात प्रबंधन तथा यंत्रीकरण के क्षेत्र में उल्लेखनीय प्रगति हुई, जिसमें एकीकृत पोषक तत्व प्रबंधन, जलवायु शमन तथा किसान-केन्द्रित प्रौद्योगिकियों पर विशेष बल दिया गया।

मृदा, जल एवं पोषक तत्व प्रबंधन

- पटसन–धान–गेहूँ फसल प्रणाली में किए गए दीर्घकालिक उर्वरक प्रयोगों से यह प्रमाणित हुआ कि एकीकृत पोषक तत्व प्रबंधन (100% NPK + FYM) उपचार ने सर्वोच्च प्रणाली उपज प्रदान की। इसके साथ ही, इस प्रबंधन पद्धति से मृदा जैविक कार्बन (SOC), उपलब्ध नाइट्रोजन, फास्फोरस एवं पोटाश (NPK) तथा मृदा जैविक क्रियाशीलता में उल्लेखनीय एवं सतत सुधार दर्ज किया गया।
- मृदा परीक्षण-आधारित लक्षित उपज पद्धति एवं दशक दीर्घ एकीकृत पोषक तत्व प्रबंधन (INM) के अनुप्रयोग से मृदा स्वास्थ्य सूचकांकों तथा लाभकारी सूक्ष्मजीवी समुदायों का सुदृढ़ीकरण हुआ। इन पद्धतियों की प्रभावशीलता मेस्ता, लहसुन एवं पटसन–धान–मसूर जैसी विविध फसल प्रणालियों में स्थायी एवं स्थिर उपज प्राप्त करने हेतु प्रमाणित हुई।

सूक्ष्मजीवी संघ (microbial consortia) एवं प्रभावी सूक्ष्मजीव (EM)-आधारित कम्पोस्टिंग तकनीकों के उपयोग से कम्पोस्टिंग अवधि लगभग 50% तक कम हुई तथा कम्पोस्ट की पोषक गुणवत्ता में उल्लेखनीय वृद्धि दर्ज की गई। इन तकनीकों से रासायनिक उर्वरकों के 50% तक प्रतिस्थापन की संभावना बनी, जबकि मृदा जैविक कार्बन में 20–24% वृद्धि तथा नाइट्रस ऑक्साइड (N_2O) एवं कार्बन उत्सर्जन में कमी देखी गई। परिणामस्वरूप, पटसन–फ्लैक्स आधारित प्रणालियों में पुनर्योजी (regenerative) एवं कार्बन-स्मार्ट कृषि मॉडल को प्रभावी रूप से सुदृढ़ किया जा सका।

जलवायु सहनशीलता एवं जल प्रबंधन

- स्प्रिंकलर आधारित सटीक सिंचाई (50% DASM पर) के

प्रयोग से पटसन उपज में 37–41% की उल्लेखनीय वृद्धि दर्ज की गई। इसके साथ ही जल उत्पादकता में सुधार, फसल जल पदचिह्न में लगभग 21% तक कमी तथा उपज-आधारित कार्बन पदचिह्न में लगभग 11% की कमी परिलक्षित हुई, जो जल एवं कार्बन संसाधनों के कुशल उपयोग को दर्शाती है।

❖ जलभराव पर किए गए अध्ययनों से यह स्पष्ट हुआ कि प्रारंभिक अवस्था (30 DAS) में जलभराव से सर्वाधिक उपज एवं रेशा गुणवत्ता हानि होती है। इसके विपरीत, JRCJ-11 जैसी सफेद पटसन किस्मों में उच्च एंटीऑक्सीडेटिव प्रतिक्रिया, उन्नत जड़ लक्षण तथा श्रेष्ठ रेशा गुणवत्ता पाई गई, जो उनकी जलभराव तनाव के प्रति अधिक सहनशीलता को रेखांकित करती है।

❖ Jute-ICARE परियोजना के तहत उन्नत प्रबंधन के अनुप्रयोग से कार्बन पदचिह्न में लगभग 25% की कमी, मृदा कार्बन भंडार में 11.5% की वृद्धि तथा कार्बन स्थिरता सूचकांक में उल्लेखनीय सुधार (1.41 से 2.14) दर्ज किया गया। इसके अतिरिक्त, इन से लगभग 1.58 टन CO_2 समतुल्य प्रति हेक्टेयर (अनुमानित US$80 प्रति हेक्टेयर) की कार्बन क्रेडिट क्षमता उत्पन्न होने की संभावना प्रदर्शित हुई।

डिजिटल, सेंसर एवं मॉडलिंग नवाचार

❖ पटसन एवं सरसों फसलों के लिए बहु-सेंसर, IoT-सक्षम स्मार्ट सिंचाई ढाँचे का विकास एवं परीक्षण किया गया, जिससे मृदा नमी एवं सूक्ष्म जलवायु मानकों की वास्तविक-समय निगरानी तथा स्वचालित, डेटा-आधारित सिंचाई निर्णय संभव हो सके। यह प्रणाली जल उपयोग दक्षता बढ़ाने और फसल-विशिष्ट सिंचाई प्रबंधन को सुदृढ़ करने में सहायक सिद्ध हुई।

❖ एडी-कोवेरिएंस (Eddy covariance) डेटा पर आधारित मृदा तापमान पूर्वानुमान मॉडलों के विश्लेषण से यह स्पष्ट हुआ कि दिवस अवधि में घातीय प्रतिगमन (exponential regression) तथा रात्रि अवधि में रैखिक प्रतिगमन (linear model) सर्वाधिक उपयुक्त हैं, जहाँ रात्रिकालीन मॉडल का निर्धारण गुणांक ®²) 0.98 तक प्राप्त हुआ। ये मॉडल पोषक तत्व खनिजीकरण प्रक्रियाओं, ग्रीनहाउस गैस (GHG) उत्सर्जन आकलन तथा भूमि-सतह तापमान मॉडलिंग के लिए उपयोगी आधार प्रदान करते हैं।

❖ Thiessen polygons आधारित स्थानिक विश्लेषण से यह सिद्ध हुआ कि सुव्यवस्थित ब्रॉडकास्ट बुवाई, लगभग समान वर्ग-जाल (square grid) दूरी का प्रभावी अनुकरण कर सकती है। इसके अतिरिक्त, 20 × 10 सेमी आयताकार पौध दूरी पर प्राप्त रेशा उपज, सघन ब्रॉडकास्ट बुवाई के समकक्ष पाई गई, जिससे बुवाई ज्यामिति के अनुकूलन द्वारा उपज स्थिरता एवं संसाधन उपयोग दक्षता में सुधार की संभावनाएँ स्पष्ट होती हैं।

फसल प्रबंधन, विविधीकरण एवं मूल्य संवर्धन

❖ प्रणाली उपज में एकीकृत (integrated) और अकार्बनिक (inorganic) प्रबंधन प्रणालियाँ जैविक/प्राकृतिक खेती की तुलना में अधिक उपज देती हैं। हालांकि, जैविक प्रबंधित पटसन–धान–मसूर क्रम में सर्वोच्च मृदा गुणवत्ता सूचकांक (Soil Quality Index) प्राप्त हुआ, जिससे स्पष्ट होता है कि जैविक और विविधीकृत फसल प्रणालियाँ मृदा स्वास्थ्य और सतत कृषि के लिए अधिक अनुकूल हैं।

❖ फाइबर फ्लैक्स में 50% NPK + FYM + Azotobacter (INM) अनुसूचियाँ 100% NPK के तुलनीय या श्रेष्ठ रेशा उपज प्रदान करती हैं। 120 दिन की फसल में अधिक कच्चा रेशा प्राप्त हुआ,100 दिन की फसल में अधिक महीन लाइन फाइबर तथा ओस-रेटिंग में उच्च गुणवत्ता वाला लाइन फाइबर प्राप्त हुआ। यह संकेत करता है कि फसल अवधि और पोषण प्रबंधन रेशा गुणवत्ता और उत्पादन पर महत्वपूर्ण प्रभाव डालते हैं।

❖ बड़े पैमाने पर पटसन Jute-ICARE गतिविधियों के माध्यम से 2.65 लाख हेक्टेयर क्षेत्र और 5.8 लाख किसान को कवर किया गया। गुणवत्तायुक्त बीज और उपकरण का वितरण ,CRIJAF Sona का प्रायोगिक उपयोग, फसल कटाई प्रयोग और प्रदर्शन, किसानों का प्रशिक्षण और मृदा स्वास्थ्य कार्ड निर्माण गतिविधियों से देश के पटसन उत्पादनकारी राज्यो में कृषि तकनीकी एवं बिस्तार अंतराल

में उल्लेखनीय कमी आई और पटसन एवं समवर्गीय रेशा फसलों के उत्पादन, गुणवत्ता और आर्थिक मूल्य संवर्धन में सुधार हुआ।

यंत्रीकरण एवं कटाई-पश्चात प्रौद्योगिकी

- ❖ संस्थान द्वारा विकसित CRIJAF बास्ट-फाइबर डेकोर्टिकेटर से रेटिंग हेतु आवश्यक जैव-द्रव्य मात्रा लगभग 60% तक कम होती है। यह डेकोर्टिकेटर 7.5–10 hp शक्ति स्रोत पर कुशल संचालन संभव बनाता है, जिससे समय और ऊर्जा की बचत होती है।
- ❖ यंत्रीकृत पटसन कटाई हेतु ट्रैक्टर-माउंटेड हार्वेस्टर का उपयोग किया गया, जिसमें सक्रिय क्षेत्र क्षमता ~0.16 हेक्टेयर/घंटा प्राप्त हुई। यह यंत्रीकरण कृषि कार्यों की उत्पादकता और दक्षता में उल्लेखनीय सुधार करता है।
- ❖ CRIJAF Sona एवं न्यूनतम-जल रेटिंग तकनीक के उपयोग से पेक्टिनोलिटिक एवं ज़ायलानोलिटिक गतिविधियाँ बढ़ती हैं, जिससे रेटिंग अवधि संक्षिप्त होती है और रेशा गुणवत्ता में सुधार होता है।

फसल संरक्षण

- ❖ पटसन जर्मप्लाज्म लाइनें OIJ-136, OEX-011, OIN-082, OIN-008 एवं OIN-016 को पीले माइट के विरुद्ध जनसंख्या घनत्व एवं क्षति सूचकांक के आधार पर सहनशील के रूप में अभिहित किया गया।
- ❖ जंगली जर्मप्लाज्म लाइनें WCIN-188, WCIN-092, WCIJ-123 एवं WCIN-009 में सेमीलूपर के विरुद्ध उच्च एंटीबायोसिस पाई गईं, जो इनमें कुल फिनॉल एवं पॉलीफेनॉल ऑक्सीडेज (PPO) की अधिक मात्रा से संबद्ध थी; अतः इन्हें संभावित प्रतिरोध स्रोत के रूप में चिन्हित किया गया।
- ❖ प्रतिरोधी (CIN-109) एवं संवेदनशील (JRC-412) जीनोटाइपों के जड़ स्रावों के प्रभाव के अध्ययन में यह स्पष्ट हुआ कि प्रतिरोधी जीनोटाइप के जड़ स्रावों ने तना सड़न रोगजनक के स्क्लेरोशिया अंकुरण को उल्लेखनीय रूप से अवरुद्ध किया।
- ❖ एकीकृत कीट प्रबंधन (IPM) मॉड्यूल [JROBA-3 + नीम खली 50 किग्रा/हे + बीज उपचार (कार्बेन्डाजिम 2 ग्रा + इमिडाक्लोप्रिड 4 मि.ली./किग्रा) + 30 DAS पर स्पायरोमीसीफेन 0.7 मि.ली./लीटर + आवश्यकता अनुसार । - सायहलोथ्रिन 0.6 मि.ली./लीटर + टेबुकोनाजोल 1.0 मि.ली./लीटर] के अनुप्रयोग से तना सड़न, माइट एवं हेरी कैटरपिलर में क्रमशः 83.7%, 79.3% एवं 85.4% की उल्लेखनीय कमी दर्ज की गई, साथ ही 6.9 क्विंटल/हे की अतिरिक्त उपज एवं 2.58 का लाभ-लागत (C:B) अनुपात प्राप्त हुआ।
- ❖ पटसन हेरी कैटरपिलर में प्रोफेनोफॉस के प्रति 10.63-गुना प्रतिरोध स्तर का आकलन किया गया, जो Carboxylesterase (*CarE*), Glutathione-S-transferase (*GST*) एवं Acetylcholinesterase (*AChE*) एंजाइम गतिविधियों में वृद्धि से सहसंबद्ध पाया गया।
- ❖ डिटैच्ड-लीफ बायोऐसे द्वारा डाइमाइड एवं नियोनिकोटिनॉइड की एकल एवं संयुक्त बीज-उपचार संरचनाओं की विषाक्तता 40 DAS तक प्रभावी पाई गई; Chlorantraniliprole 62.5 FS @ 9 मि.ली./किग्रा पर सर्वाधिक मृत्यु दर अभिलक्षित हुई।
- ❖ ताप-आश्रित विकास अध्ययन में लार्वा एवं प्यूपा अवस्थाओं के लिए क्रमशः 36.7 °C एवं 31.5 °C को इष्टतम तापमान निर्धारित किया गया, जो चरण-विशिष्ट ऊष्मीय संवेदनशीलता तथा जलवायु-आधारित कीट पूर्वानुमान मॉडलिंग के उपयोग को वैज्ञानिक आधार प्रदान करता है।

EXECUTIVE SUMMARY

ICAR- Central Research Institute for Jute and Allied Fibres (ICAR-CRIJAF) has the mandate to carry out basic, strategic and applied research aimed at enhancing production, productivity and sustainability of the jute and allied fibre crops in India. The research programmes of the institute are framed around three major theme areas: Crop Improvement, Crop Production and Crop Protection. The newly developed technologies and varieties are validated through the All India Network Project on Jute and Allied Fibres (AINP-JAF) and the validated technologies are scaled up among the stakeholders through extension and outreach programmes. During 2025, the institute made significant achievements in research and demonstrated the technologies to jute and allied fibre growing farmers through various programmes. The executive summary of the report is presented below.

Crop Improvement

- A variety of tossa jute (*C. olitorius*) 'JRO-2024' with average yield of 32 q/ha, yield advantage of 7.50% than checks, higher premature flowering resistance, suitable for jute-green gram intercropping facilitating additional income have been released and notified. In addition, a total of 33 genotypes of different jute and allied fibre crops are being evaluated under different trials (IVT, AVTs, Adaptive) of AINPJAF coordinated trials
- Out of 150 germpalsm evaluated for premature flowering resistance, seven germplasm accession lines have been identified to be resistant to premature flowering resistant. Four lines out of core collection have been found to be water-logging tolerant. Likewise, laboratory experiments pertaining to the study of feeding preference, larval duration and larval survival of jute semilooper on a total of 30 wild Corchorus germplasms with 10 each belonging to *C. tridens, C. aestuans* and *C. pseudo-olitorius* and the cultivated cultivar *C. olitorius* (JRO 204) that served as control were conducted. Two genotypes each from *C. tridens*, *C. aestuans* were found to be highly tolerant and one genotype from *C. pseudo-olitorius* was found to be highly susceptible to jute semilooper. These five germplasm lines have been processed for registration. However, a total of 5914 JAF germplasm conserved at ICAR-CRIJAF and a total of 2529 jute and allied fibres germplasm lines was distributed to ICAR-CRIJAF scientists and other indenters.
- Under genome editing programme, in jute (*C olitorius* cv. JRO 524), targeted editing of lignin biosynthetic pathway gene- Coumarate 3-hydroxylase (C3H) was attempted to reduce fiber lignin content, and editing of Flowering locus T (FT) gene was targeted to prevent short-day flowering. Guide RNAs (gRNAs) for both of these genes were designed after careful

analysis of different isoforms and were cloned into the plant genome editing vector pRGEB31 (Figure 1). Besides, a GUS gene construct in pCAMBIA1301 was also used to test the transformation efficiency. All three constructs were mobilized into the GV3101 strain of *Agrobacterium tumefaciens* and used for plant transformation.

- Under haploidy induction programme in jute, several medium combinations for standardization of microspore culture were tried with the anthers harvested at different stages after anthesis. Initially, two media containing zeatin and NAA with STTS supplementation; and another having BAP, NAA with STS were used for callus induction from the anthers of JRO504, JRO204, and JRC212. BN STS produced the best responses for JRO204 and JRO524 and were used for microcalli in solid medium as well as in suspension cultures. In the case of JRO524 and JRO204, callusing began after 44 days. After subculturing for 21 days, a small number of calli increased in size. After 5 to 6 subcultures, green calli were obtained without emerging shoots. Efforts are underway to establish anther generated plants in controlled plant growth facility for hardening.

- Genotyping of 220 individual F_2 plants from WCIN 183A (resistant) X OIN456 (susceptible) through screening random bulks using 30 polymorphic markers ILP based on previous parental polymorphism two distinct ILP primers, revealed bands for lines 52, 64, and 66 that corresponded to the resistant parent. During a phenotypic investigation, the same lines demonstrated resistance against, *Macrophomina phaseolina*.

- To establish a robust molecular marker resource for jute, a dedicated GUI-based software tool named ILP_Miner was designed, which automates the process of ILP marker discovery by utilizing genome and annotation datasets as input and generating optimal primer pairs for each intron as output. Using this tool, a total of 1,23,568 ILP markers in *C capsularis* and 1,12,729 ILP markers in *C olitorius* were identified, indicating wide intronic variation within jute genomes. From these, 150 ILP markers were synthesized and validated for their amplification and polymorphism across released varieties. To enable long-term access and use by breeders and researchers, a Jute ILP Marker Database was developed, which stored markers with details such as genomic position, primer sequences, and allele information. This serves as the first large-scale ILP marker repository for jute and strengthens the molecular toolkit available for crop improvement.

- In flax breeding programme, station trial evaluation of six lines at F_7 selected from pedigree method of breeding with check identified three lines performing better than check namely, JRFJ 2025-4, JRFJ 2025-1, JRFJ 2025-5. Being very superior promising genotypes those have been nominated to AINPJAF coordinated trial IVT 2025-26 Rabi. Similarly , a total of six lines at M8 selected in mutation breeding were evaluated in station trial and three mutant lines namely JRFJM 5, JRJFM 2, JRFJM 4 were found to be superior to check JRF 2 and thus be nominated to AINPJAF IVT trial of Rabi 2025-26.

- The pectin content analysis of the F_2 population derived from the cross SS-2 × JRO-

524 revealed a wide and continuous, 0.5% to 3.5% indicating pectin content is a quantitatively inherited trait governed by multiple genes. A large proportion of F_2 individuals clustered around the 2.0–2.5% range, suggesting a near-normal distribution typical of polygenic traits, with a slight skew towards lower values likely due to the contribution of recessive alleles from the low-pectin parent SS-2. The presence of both low-pectin plants resembling SS-2 and high-pectin plants exceeding the levels of JRO-524 indicates the occurrence of transgressive segregants.

- During 2024-25 kharif against the total indent (DAC and others) of 9.25 q, breeder seed of 14.37 q of jute, mesta, sunnhemp and during 2024-25 Rabi 4.5 q flax breeder seed were produced. Around 93 ton of certified and TL seed of rice, mustard, wheat, jute, mungbean sunnhemp, dhaincha and flax were produced.
- Two varieties namely, JROB2 (tossa jute) and JRCJ 11 (white jute) have been registered with Protection of Plant Variety and Farmers Right Authority and second cycle of DUS testing of two varieties of JROBA 3(*tossa* jute) and JRCP 5(white jute) have been completed.

Crop Production

Substantial progress in enhancing soil and water productivity, climate-resilient jute-based systems, crop and post-harvest management, and mechanization, with strong emphasis on integrated nutrient management, climate mitigation, and farmer-centric technologies have been made as follows

Soil, water and nutrient management

- Long-term fertilizer experiments in the jute–rice–wheat system confirmed the superiority of integrated nutrient management (100% NPK + FYM), which delivered the highest yields and markedly improved soil organic carbon, available NPK, and biological activity compared to imbalanced or unfertilized controls.
- Soil test–targeted yield approaches and decade-long INM under jute-based systems enhanced soil health indices and beneficial bacterial communities, validating ST-TY equations and INM as robust tools for sustaining yields of crops like mesta, garlic and jute–rice–lentil.
- Microbial consortia and EM-based composting technologies halved composting time, increased compost nutrient quality, allowed 50% substitution of synthetic fertilizers, raised soil organic carbon by 20–24%, and reduced nitrous oxide and carbon emissions, underpinning regenerative carbon-smart farming models in jute–flax systems.

Climate resilience and water management

- Precision irrigation using sprinkler systems at 50% DASM increased jute yield by 37–41%, improved water productivity, reduced crop water footprint by ~21%, and lowered yield-scaled carbon footprint by ~11%, enhancing the carbon sustainability index of jute-based systems.

- Waterlogging studies showed early-stage flooding (30 DAS) causes the greatest yield and fibre-quality loss, while white jute genotypes such as JRCJ 11 exhibits stronger antioxidative responses, better root traits and superior fibre quality, indicating their higher tolerance to excess water.
- Under Jute-ICARE programme improved package of practice reduced carbon footprints by about 25%, increased soil carbon stocks by 11.5%, improved carbon sustainability index (from 1.41 to 2.14), and created carbon credit potential of ~1.58 t CO_2 ha^{-1} (about US$80 ha^{-1}), demonstrating jute as a climate-smart crop for vulnerable regions.

Digital, sensor and modelling innovations

- A smart multi-sensor, IoT-enabled irrigation framework was developed and field-tested for jute and mustard, enabling real-time monitoring of soil moisture and microclimate and automating irrigation decisions to improve water-use efficiency and crop performance under a changing climate.
- Soil temperature prediction models for jute, rice and wheat using eddy-covariance datasets showed that exponential regressions best describe daytime relations, while linear models suffice at night, with high night-time R^2 values (up to 0.98), offering tools for nutrient mineralization, GHG and land-surface temperature modelling in Indo-Gangetic jute systems.
- Image-based spatial analysis of jute stands using Thiessen polygons demonstrated that well-managed broadcast sowing can mimic near-uniform square-grid spacing and that optimal rectangular spacing (20 cm × 10 cm) yields fibre comparable to suitably dense broadcast patterns.

Crop management, diversification and value addition

- Integrated and inorganic systems outperformed organic and natural farming for system yield, but organically managed jute–rice–lentil rotations achieved the highest soil quality indices, indicating that organic sequences are pivotal for long-term soil health in the eastern Indo-Gangetic plains.
- For fibre flax, INM schedules with 50% NPK + FYM + *Azotobacter* matched or exceeded 100% NPK for fibre yield, while experiments on harvest and retting duration showed that 120-day crops maximize raw fibre yield, 100-day crops give finer line fibre, and dew retting generally produces higher line fibre yields and strength.
- Large-scale Jute-ICARE activities covered 2.65 lakh ha and 5.8 lakh farmers, with extensive distribution of quality seed, implements, and CRIJAF Sona, along with hundreds of crop-cutting experiments, demonstrations, trainings, and soil health card generation, significantly narrowed down technology and extension gaps in major jute-growing states of India.

Mechanization and post-harvest technologies

- The CRIJAF bast fibre decorticator was developed for rapid ribbon extraction from jute and other bast crops, reducing biomass volume for retting by about 60% and operating efficiently on 7.5–10 hp power sources without requiring special skills.
- Mechanized jute harvesting with a tractor-mounted tall crop harvester achieved a field

capacity of ~0.16 ha hr^{-1}, cutting and aligning plants in a single pass and offering a viable option for large-scale, line-sown jute under suitable field conditions.

- Minimal-water retting technologies using CRIJAF Sona significantly enhanced pectinolytic and xylanolytic activities and related microbial populations in retting water, shortening retting duration and improving fibre release while avoiding cellulolytic damage, thereby supporting water-efficient and quality-oriented retting systems.

Crop Protection

- Jute germplasm lines, OIJ-136, OEX-011, OIN-082, OIN-008 and OIN-016 were identified to be tolerant against yellow mite on the basis of population density and damage grade. These lines were more consistent both in terms of less infestation and damage across the seasons.
- The wild germplasms of jute including WCIN 188, WCIN 092, WCIJ 123, and WCIN 009 were identified to be potential resistant source against jute semilooper showing high degree of antibiosis with higher concentration of total phenols and polyphenol oxidase. These valuable genetic resources can be used for breeding resistant varieties against *A. sabulifera* in jute improvement programs
- In host pathogen interaction, the effect of root exudates from resistant jute genotype (CIN109) and susceptible host (JRC412) on pathogen sclerotia germination was observed. Stem rot pathogen sclerotia germination in root exudates of resistant plants suppressed slcerotia germination of stem rot pathogen.
- IPM module consisting of moderately pest tolerant jute variety, JROBA 3 along with pre-sowing soil application of neem cake @ 50 kg/ha, seed treatment of of carbendazim @ 2 g + imidacloprid @ 4 ml/kg, foliar spray of spiromesifen 240 SC @ 0.7 ml/litre at 30 DAS, need based spray of λ-cyhalothrin 5 EC @ 0.6 ml/litre and tebuconazole 250 EC (25.9% w/w) spray @ 1.0 ml/litre caused ssignificant reduction in stem rot (83.7%) and mite (79.3%), hairy caterpillar(85.4%) with advantage of 6.9 q/ha and C:B ratio: 2.58.
- Jute hairy caterpillar showed 10.63-fold insecticide resistance against profenophos. The resistance manifestation was due to the elevation in enzyme titres of CarE, GST, and AchE. B type esterase isozymes are associated with carboxylesterase activity.
- Detached- leaf bioassay established the persistent toxicity of feed treating formulations of sole and combination product of dimide and neonicotinoid insecticides against early infesting lepiodopteran insects. The effect persisted upto 40 DAS and significantly highest mortality was in case of Chlorantraniliprole 62.5 FS @9ml/kg. There was no adverse effect of seed treatment on seed germination, seedling dry weight and seedling vigor of jute.
- Temperature-Dependent development of hairy caterpillar showed 36.7 °C optimum temperature for larvae and 31.5 °C for pupa indicating stage-specific thermal sensitivity. The results support the use of non-linear temperature-dependent models for phenology prediction and climate-based pest forecasting of jute hairy caterpillar.

ICAR-CRIJAF: at a Glance

ICAR-CRIJAF (Central Research Institute for Jute and Allied Fibres) is a premier research institute of Indian Council of Agriculture Research (ICAR) situated at Barrackpore, West Bengal (India). The institute mainly deals with six natural fibre crops viz**.,** jute, mesta, sunnhemp, sisal, ramie and flax. To carry out research on various aspects of jute and allied fibres (JAF) the institute has three divisions namely, Crop Improvement, Crop Production and Crop Protection. All India Network Projects (AINP) on Jute and Allied Fibres is also supporting Research, Development and Transfer of Technology. The Institute spread its sphere of Research activities to the length and breadth of the Nation by establishing its Research Stations in Uttar Pradesh (Sunnhemp Research Station, Pratapgarh), Assam (Ramie Research Station, Sorbhog), Odisha (Sisal Research Station, Bamra) and West Bengal (Central Seed Research Station for JAF, Budbud). Besides, the Institute has nine State Agricultural University (SAU) based and six ICAR institute based collaborating centres for multi-locational testing and validation of the technologies including varieties under AINP on JAF. It has two Krishi Vigyan Kendra (KVK) working for the farming community of Burdwan and North 24 Parganas districts of West Bengal.

The multi-disciplinary scientific team of the Institute is dedicatedly working towards development of highly productive varieties with high quality fibre which can meet the need to make high value diversified products. Scientists work for resource management in farming for better energy efficiency and economic input allocation, developing suitable agronomic practices supported with farm implements for minimizing climatic change related risks, soil degradation, drudgery, etc. and for socio-economic upliftment of farming community by improvement in agriculture production and efficient utilization of natural resources. Emphasis is also on development of eco-friendly methods for crop management and enhancing livelihood security of farmers through reducing the crop yield losses by management of diseases and insect-pests. Findings of the research activities are instrumental in providing recommendations for developing policies, programmes, models and approaches for sustainable jute and allied fibre production. The main strength of the institute is excellent well trained human resources. Presently the Institute has a total strength of one hundred forty staff with forty Scientists sixty technical staff twenty eight Administrative staff and twelve supporting staff.

History

The Indian Central Jute Committee (ICJC) was formed in 1936 in view of the economic importance of jute in the country. Subsequently Jute Agricultural Research Laboratory (JARL) was established in 1938 at Dhaka of undivided Bengal. After partition (1947), Jute Research Institute was shifted to Chinsura and then to Barrackpore, West Bengal and finally established as Jute Agricultural Research Institute (JARI) at Nilganj, Barrackpore in 1953. In 1966, JARI was taken over by Indian Council of Agricultural Research (ICAR) and the Institute was renamed as Central Research Institute for Jute and Allied Fibres (CRIJAF) in 1990.

To carry out research on jute and allied fibres, the Institute established four research stations namely Central Seed Research Station for Jute and Allied Fibres at Budbud, West Bengal (1956), Ramie Research Station, at Sorbhog, Assam (1959) Sisal Research Station, at Bamra, Odisha (1962) and Sunnhemp Research, Station at Pratapgarh, Uttar Pradesh (1963). Besides, the Institute has nine SAU based and six ICAR institute based collaborating centres for multi-locational testing of varieties and validation of the CRIJAF technologies under All India Network Projects on Jute and Allied Fibres (AINP on JAF). Two KVKs under the administrative control of ICAR-CRIJAF was established in 2006 and 2017 at Burdwan and 24 Parganas (N) district of West Bengal, respectively.

Administration

The Institute is headed by the Director and supported by Divisional Heads, Sectional Incharges, Senior Administrative Officer and Finance & Accounts Officer for the execution and implementation of various research activities and other programmes. The Institute Management Committee (IMC) guides and supports the Director from time to time to review of programs. The Research Advisory Committee (RAC) and Institute Research Council (IRC) provide broad guidelines and assist in developing and implementing specific research programmes and projects.

Central Seed Research Station for JAF, BudBud (W.B.)

Sunnhemp Research Station, Pratapgarh (U.P.)

Sisal Research Station, Bamra (Odisha)

Ramie Research Station, Sorbhog (Assam)

Sub-stations of ICAR-CRIJAF

Research Areas

The selected areas of research in jute and allied fibre are- breaking yield barrier, bridging the yield gap and area expansion, improving fibre quality, ecosystem services like natural resource conservation, climate change mitigation, diversification, value addition, value chain, wealth from waste, profiling of immunity-boosting bioactive compounds for medicinal use of jute and allied fibres.

Research Laboratories and Facilities

- PCR based Genotyping
- Microscopy and Histology of plant samples
- Fibre fineness and strength testing
- Bio-Informatics using NGS
- Soil and plant Testing
- Biolog based bacterial identifications
- Virus Indexing of tissue culture raised plant
- Histo-Pathological studies of plant samples
- Neutron moisture meter
- Penitrologger based soil compactness study
- Photosynthesis rate measurement
- Virtual Library through CeRA platform
- Research farms for field experiments
- Agricultural Knowledge Management Unit
- Jute and Allied Fibre Museum
- Infrastructure (Auditorium, Guest House, Canteen, Clinic, Sports facilities)

Technology Evaluation & Dissemination

All India Network Project on Jute and Allied Fibres (AINPJAF): AINPJAF is being implemented by ICAR-CRIJAF since April, 1974. At present, this project has 14 centres including 8 SAU-based and 6 ICAR-institute based collaborative centres for multi-locational evaluation of the varieties, validation of production and protection technologies and quality evaluation of the fibres.

KrishiVigyan Kendra: KVK, Purba Bardhaman (2005) and KVK-Addl, North 24 Parganas (2016) are functioning under ICAR-CRIJAF for capacity building through training and other promotional extension activities in jute based farming system. Both KVKs are well equipped with facilities like trainee's hostel, soil testing laboratory, seed production unit and demonstration units.

Education

Regional Centre of National Agricultural Education Accreditation Board: On recommendation of the accreditation board of ICAR, this institute (ICAR-CRIJAF) has been selected as the nodal centre for eastern and north-eastern region for facilitating the submission of self-study reports (SSRs) of the agricultural universities, colleges and other modalities required for accreditation.

Human Resource Development Cell: The institute has been recognized for research work for M.Sc and Ph.D programmes by the Presidency University, Calcutta University, R.K.M. Vivekananda University and Adamas University. Besides, the cell also conducts short term summer training for M.Sc students of SAUs and general universities. HRD cell develop the year wise training schedule for all categories of staff and monitor training programmes IARI-Kolkata Education Hub.

Management Unit

Agricultural Knowledge Management Unit (AKMU): AKMU facilitates the infrastructure for e-governance, manages research information and provides a stable internet facility. The unit is responsible for maintenance and updating of the institute website, operating the e-extension, mobile advisory, agro-advisory services and other activities

Institute Technology Management Unit (ITMU): ITMU deals with protection of intellectual properties (IPs), their maintenance and commercialization of the technologies developed by the institute. It also looks after consultancy, contract research, patents, technology protection protocols, licensing etc.

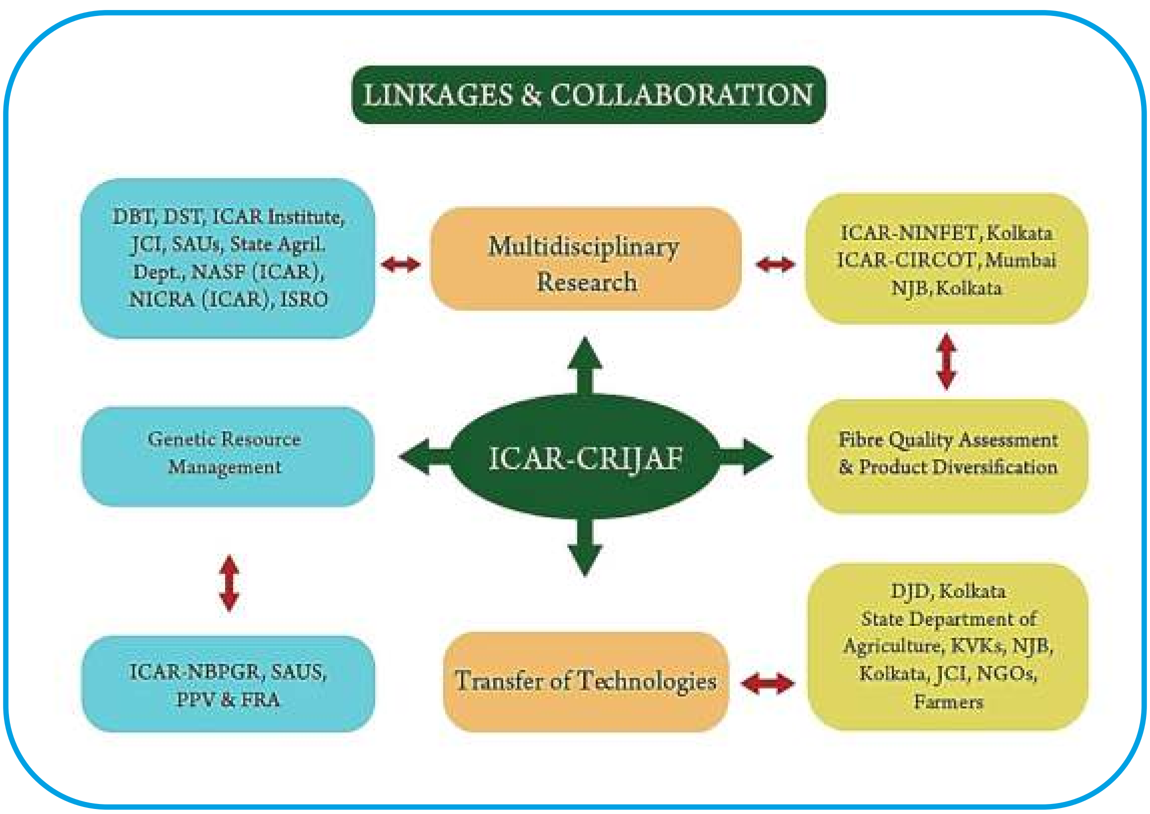
Management Cell

Prioritization, Monitoring and Evaluation (PME) Cell: PME of the Institute is working as "Single window" system for priority setting, research monitoring and evaluation, maintenance of databases related to projects, achievements, technologies developed, publication etc. PME cell coordinates in maintaining the information and documentation of all the in-house as well as externally funded projects.

Women Cell: The Internal committee addresses the issues related to grievances of women employees. This cell also organizes awareness programmes for the women for enhancing their income and the management of family and welfare of the society.

Linkages

The research programs are partly supported by grants-in-aid from the DBT, ISRO, NASF, SRD, NICRA, NJB, DST, and RKVY for extra-mural projects. Besides, collaborative programs are also conducted with SAUs, DJD, NINFET, JCI, NJB, PPV and FRA. The International organization like BJRI, Bangladesh is associated for R & D activities.



Unified Budget of ICAR-CRIJAF

Overal budget of ICAR-CRIJAF

(in Lakh)

S. No.	Sub-Head	BE 2025-26	RE 2025-26 (proposed)	Actual Expenditure (Apr-Dec 2025)
A)	**GRANT FOR CREATION OF CAPITAL ASSETS (CAPITAL)**			
1	Works - Office Building	0.00	0.00	0.00
2	Equipment	83.00	119.00	57.84
3	Information Technology	1.00	1.00	0.90
4	Furniture & Fixtures	0.00	0.00	0.00
5	Others	36.00	0.00	0.00
	Sub-Total (A)	**120.00**	**120.00**	**58.74**
A)	**GRANTS IN AIDS – SALARIES (REVENUE)**			
1	Establishment Expenses – Salaries	2760.00	2768.00	**2305.28**
	Sub-Total (B)	2760.00	2768.00	**2305.28**
A)	**GRANTS IN AIDS - GENERAL (REVENUE)**			
1	Pension & Other Retirement Benefits	350.00	385.00	265.14
2	Travelling Allowances	22.00	22.00	14.5
3	Research & Operational Expenses	246.00	246.00	203.09
4	Administrative Expenses	410.00	410.00	264.12
5	Miscellaneous Expenses (HRD & Others)	11.70	11.70	11.35
	Sub-Total (C)	**1039.70**	**1074.70**	**758.20**
A)	**TSP**			
1	Capital	0.00	0.00	0.00
2	Revenue	33.00	33.00	23.20
	Sub-Total (D)	**33.00**	**33.00**	**23.20**
A)	**NEH**			
1	Capital	0.00	0.00	0.00
2	Revenue	85.00	85.00	56.53
	Sub-Total (E)	**85.00**	**85.00**	**56.53**
A)	**SCSP**			
1	Capital	6.00	6.00	0.56
2	Revenue	68.00	68.00	48.93
	Sub-Total (F)	**74.00**	**74.00**	**49.49**
GRAND TOTAL (A+B+C+D+E+F)		**4111.70**	**4154.70**	**3251.44**

Financial Statement of AINPJAF and KVKs

Head	Target (B.E.) 2025-26	Achievement (Apr-Dec 2025)
AINPJAF	380.00	331.79
KVK, Purba Bardhaman	279.40	203.47
KVK, North 24 Parganas (Addl)	208.90	160.81

REVENUE Generated (upto 31-12-2025)

ICAR-CRIJAF Head Quarter, Barrackpore	CSRSJAF, Budbud	Ramie Research Station, Sorbhog	Sisal Research Station, Bamra	Sunnhemp Research Station, Pratapgarh	Total	Target
65.89	33.01	5.60	8.68	0.11	**113.29**	183.00

Staff Position

Position	Sanctioned	Filled	Vacant
Director (R.M.P.)	01	01	00
Head of Divisions	03	03	00
Principal Scientists	02	01	01
Senior Scientists	10	08	02
Scientists	40	27	13
Technical Officers / Technical Assistants	108	60	48
Sr. Administrative Officer	01	00	01
Sr. Finance and Accounts Officer	01	01 (FAO)	00
Administrative Officer	02	01	01
Assistant & Administrative Officer	07	07	00
Private Secretary	01	01 (PPS)	00
Personal Assistants	02	02 (PS)	00
Assistants	18	13	05
Upper Divisional Clerks (UDC)	04	03 (01 on Deputation)	01
Lower Divisional Clerks (LDC)	05	02	03
Skilled Support Staff	46	12	34
Grand Total	**251**	**142**	**109**

CROP IMPROVEMENT

Overview

Jute and allied fibres (JAF) are important commercial crops all over the world, particularly in India. Maintaining low lignin and fibre fineness is becoming increasingly crucial for crop improvement in the face of changing climate, abiotic stress, new pathogens, drought, and water logging conditions. Germplasm from various agro-ecological and diversity-rich areas of India and abroad has been introduced through national and international efforts. The Division of Crop Improvement is successfully utilising these germplasm in breeding programs to improve the yield and quality of these natural fibres. It also serves as India's National Active Germplasm Site (NAGS) for jute and allied fibre crops. To improve the efficiency of varietal development, the Division has been regularly improving its research programmes, keeping in mind new breakthroughs in crop breeding and biotechnology.

Priorities & Thrust Areas

- Collection, characterization, evaluation, conservation and utilization of JAF germplasm
- Development of new varieties of JAF crops with high yielding potential, improved fibre quality with biotic and abiotic stress resistance through advanced breeding strategies
- Genetic enhancement in traits of economic importance through pre-breeding and molecular breeding
- Increasing breeding efficiency through genomic and transcriptomic interventions
- Production of breeder and nucleus seed of all the released varieties of JAF crops for indenters

Research Highlights (2025)

- Release of tossa jute (*C. olitorius*) variety 'JRO-2024' with high yield , higher premature flowering resistance, suitable for jute-green gram intercropping facilitating additional income
- Identification of four lines water-logging tolerant out of core collection and two highly tolerant to jute semilooper genotypes each from C. *tridens, C. aestuans*
- Under genome editing programme, in jute (*C olitorius* cv. JRO 524), targeted editing of lignin biosynthetic pathway gene- Coumarate 3-hydroxylase (*C3H*) was attempted to reduce fiber lignin content, and editing of Flowering locus T (*FT*) gene was targeted to prevent short-day flowering.
- Genotyping of F_2 plants from WCIN 183A (resistant) X OIN456 (susceptible) through screening random bulks through ILP
- To establish a robust molecular marker resource for jute, a dedicated GUI-based software tool named ILP_Miner was designed, and a total of 1,23,568 ILP markers in *C capsularis* and 1,12,729 ILP markers in *C olitorius* were identified
- A total of 6 genotypes of flax fibre has been nominated to AINPJAF IVT trial of Rabi 2015-26

1.Biotechnological Intervention

1.1 Enhancing climate resilience and ensuring food security with genome editing tools

S. Datta, D. Saha, G. Kar and P. Satya

Project Code: ICAR-028/CI/IFX

Genome Editing of Jute (*Corchorus olitorius*) and Flax (*Linum usitatissimum)*

In jute (*Corchorus olitorius* cv. JRO 524), targeted editing of the lignin biosynthetic pathway gene coumarate 3-hydroxylase (*C3H*) was attempted to reduce fibre lignin content, and editing of the flowering locus T (*FT*) gene was targeted to prevent short-day flowering. Guide RNAs (gRNAs) for both genes were designed after careful analysis of different isoforms and were cloned into the plant genome editing vector pRGEB31 (Fig. 1). In addition, a GUS gene construct in pCAMBIA1301 was used to test transformation efficiency. All these constructs were mobilised into the GV3101 strain of *Agrobacterium tumefaciens* and used for plant transformation.

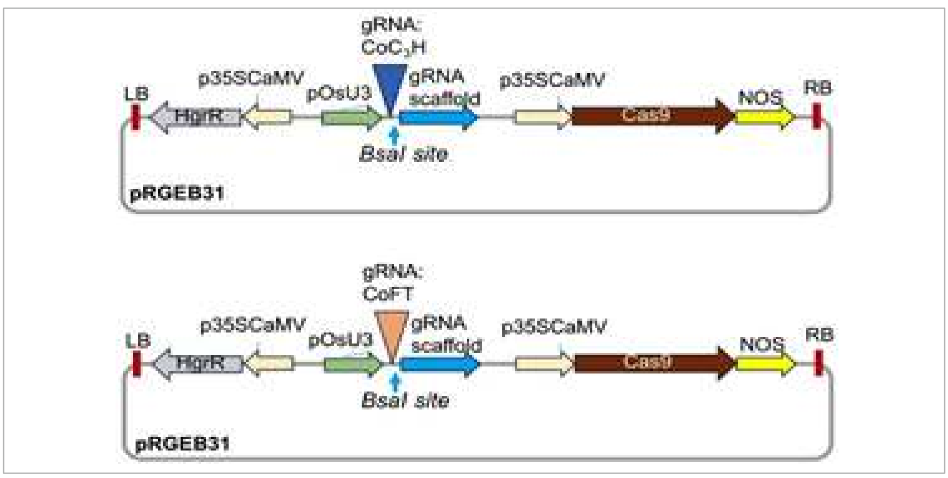


Fig. 1. Schematic maps of the pRGEB31 vector harbouring gRNAs of *C3H* and *FT* genes.

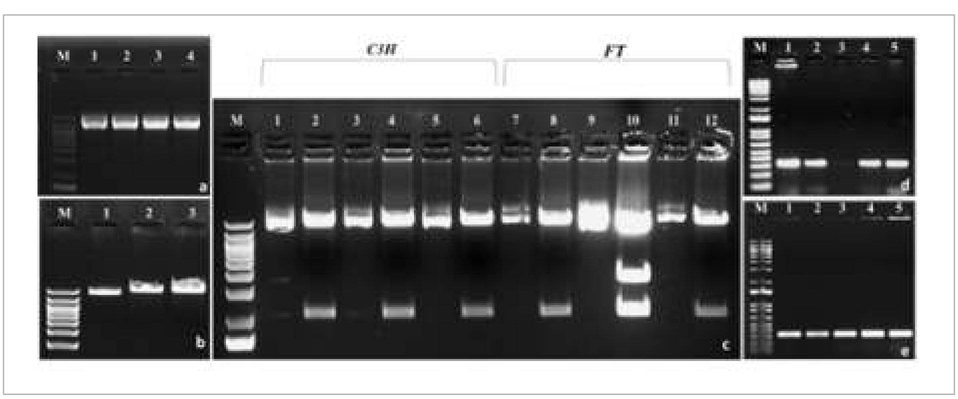


Fig. 2. Gel images representing the cloning procedure for *C3H* and *FT* genes (a) Isolated plasmid pRGEB31 (lane 1-4); (b) undigested pRGEB31 (lane 1), and digested pRGEB31 vector using *BsaI* (lane 2-3); (c) restriction analysis using *BsaI* and *SacI* double digestion for clone confirmation (lanes 1–6: constructs containing the *C3H* gene insert; lanes 7–12: constructs containing the *FT* gene). All positive clones exhibited the characteristic two-band pattern (~13 kb and ~2kb), confirming gRNA cloning. (d-e) Colony PCR product of transformed *A. tumefaciens* GV3101 showing the amplification of the *C3H* and *FT* genes, respectively.

The isolated pRGEB31 plasmid was linearised via restriction digestion with *BsaI,* followed by ligation of an oligo duplex of the respective gRNAs before transformation into the DH5α strain of *Escherichia coli*. Putatively transformed colonies were screened through double digestion using *SacI* and *BsaI,* and positive clones were transformed into *A. tumefaciens* strain GV3101. Putative transformants were confirmed again by colony PCR using *FT* and *CH3* gRNA-specific forward and M13 vector-specific reverse primers (Fig 2). Similarly, gRNA sequences targeting *LusCenH3* and *LusNAC03* genes of the flax cultivar JRF-2 were cloned and confirmed in the pRGEB31 vector. Agrobacterium cultures harbouring editing vectors with respective gRNAs were used to co-cultivate jute and flax hypocotyl explants for plant transformation.

The protocol for *Agrobacterium tumefaciens*-mediated genetic transformation has been standardised for tossa jute (*Corchorus olitorius* cv. JRO 524) (Fig. 3) and flax (*Linum usitatissimum* cv. JRF 2) (Figure 4). Agrobacterium strain GV3101 harbouring pCAMBIA1301 was used to infect freshly excised explants. In jute, two different types of explants were used: hypocotyl segments and cotyledonary attached petioles from aseptically grown seedlings. Varying concentrations of acetosyringone and co-cultivation durations were optimised accordingly. Multiple shoot regeneration from calli on hygromycin-containing media was achieved. A total of 720 explants were co-cultivated with the GUS construct, resulting in the induction of 201 calli and the regeneration of 209 shoots. Of these, 190 calli were subjected to hygromycin selection. The co-cultivated explants were also processed for GUS histochemical assays to evaluate transient gene expression and estimate transformation efficiency. For the *CoC3H* construct, 619 explants were co-cultivated, producing 88 calli and 148 regenerated shoots. Similarly, co-cultivation with the *CoFT* construct involved 320 explants, from which 70 calli and 76 regenerated shoots were obtained were obtained.

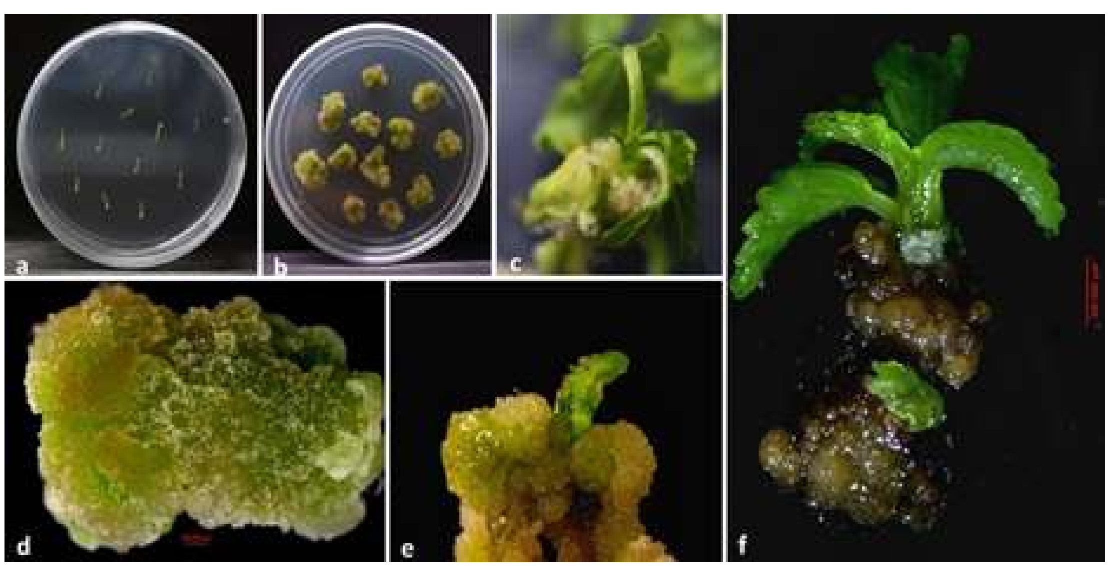


Fig. 3. Development of *Agrobacterium*-mediated genetic transformation protocol for tossa jute (*Corchorus olitorius* cv. JRO 524); a) 6 days old hypocotyl inoculated onto callus induction media post co-cultivation; b) Swelling of callus 25 DAI; c) Regeneration of shoot from callus; d-f) Stereo zoom microscope (0.63X) view of callus; shoot emergence from callus; callus-regenerated caulogenesis, respectively.

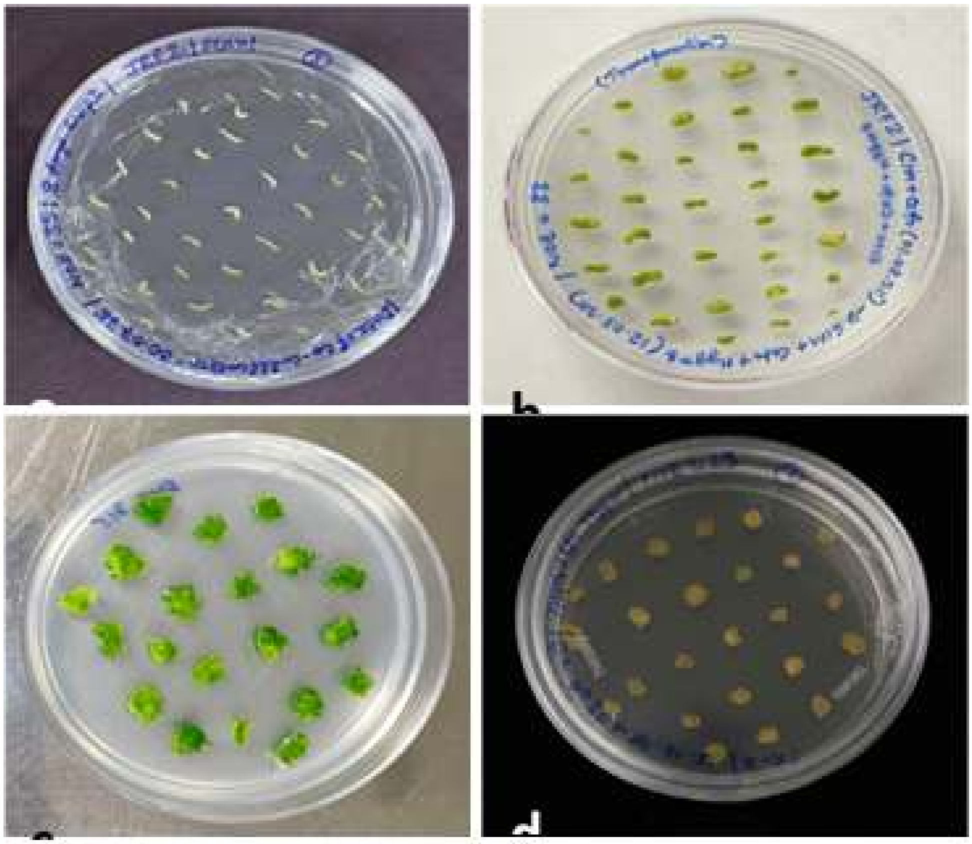


Fig. 4. Development of *Agrobacterium*-mediated genetic transformation protocol for flax (*Linum usitatissimum* cv. JRF 2); a) Inoculation of hypocotyls on the first day; b) Swelling of calli from the inoculated explants; c) Regenerated calli for hygromycin selection; d) Cessation of regeneration of calli upon exposure to hygromycin supplemented media.

Agrobacterium tumefaciens strain GV3101 was used for the genetic transformation of flax *(L. usitatissimum cv.* JRF 2) with the pCAMBIA-GUS gene construct. Freshly excised hypocotyls from aseptically grown 8-day-old seedlings, used as explants, were infected with *Agrobacterium* suspension containing different concentrations of acetosyringone for 20-30 mins at 28 °C with gentle agitation. Explants were blot-dried on sterile tissue paper to remove excess bacteria and co-cultivated on MS medium supplemented with a combination of cytokinin (KIN) and auxin (2,4-D) in the dark. Following co-cultivation, explants were washed three times with autoclaved ddH_2O containing cefotaxime antibiotic to remove residual *Agrobacterium* and transferred to callus induction medium (CIM) supplemented with cefotaxime antibiotic for three weeks under a 16/8 h light/dark cycle to monitor the regeneration. A total of 120 explants were co-cultivated with the GUS construct, resulting in the formation of 47 calli in total. Among these, 33 calli were subjected to hygromycin selection and were subcultured for regeneration (Figure 4).

1.2 *In vitro* regeneration and haploidy induction in jute

S. Datta, K. Meena, K.N. Chaurasia and R. Bhowmik

Project Code: In-house project JBT 4.9

Microspore culture in jute

For the standardisation of microspore culture in jute, several medium combinations were tried with the anthers harvested at different stages after anthesis. Initially, two media containing zeatin and NAA with STTS supplementation and another containing BAP and NAA with STS were used for callus induction from the anthers of JRO504, JRO204, and JRC212. BN STS produced the best responses for JRO204 and JRO524 and were used for microcalli in solid medium as well as in suspension cultures. In the case of JRO524 and JRO204, callus formation began after 44 days. After subculturing for 21 days, a small number of calli increased in size were observed. After 5 to 6 subcultures, green calli were obtained, which will be used to regenerate haploid plants.

1.3 Comparative pan-genome analysis of Indian and global flax genepool

D. Saha

Project code: ANRF-funded (ANRF/IRG/2024/000305)

Chloroplast genome of flax cv. JRF-2

The genome sequence of flax (*Linum usitatissimum*) cv. JRF-2 was generated using Illumina paired-end reads, yielding a total of 10 GB of data. A complete circular chloroplast genome sequence was assembled for flax using a genome skimming approach.

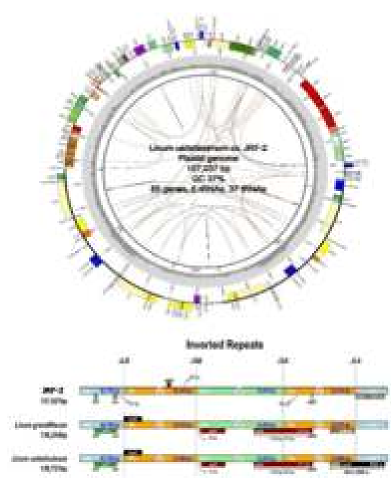


Fig. 5. Complete chloroplast genome map of *Linum usitatissimum* (flax) cv. JRF-2 and comparisons of the repeat junction region with the sequence differences.

The repetitive sequences, codon usage patterns, RNA editing sites, and nucleotide diversity patterns were similar to those of chloroplast genomes from other Linum species. A comparative analysis of the chloroplast genomes of the three *Linum* species revealed diverse sequences in the repeat junction regions. The chloroplast genome of flax cv. JRF-2 is characterised by a bipartite structure comprising large single copy (LSC) and small single copy (SSC) regions separated by two inverted repeat (IR) regions. The JRF-2 plastid genome was 157,037 bp long and had a GC content of 37%. The annotation of the JRF-2 plastid genome showed that it contained 85 protein-coding genes, 37 tRNA genes, and 8 rRNA genes (Fig. 5).

1.5 Development of molecular marker panel for DNA fingerprinting of Jute

Rakesh Bhowmick, Thribhuvan R.

Project code: In-house project JBT 5.1

Development of IPL marker

Intron Length Polymorphism (ILP) markers were developed in this project to establish a robust molecular marker resource for jute. A dedicated GUI-based software tool named ILP_Miner was designed to automate the process of ILP marker discovery by utilising genome and annotation datasets as input and generating optimal primer pairs for each intron as output. Using this tool, 1,23,568 ILP markers in *Corchorus capsularis* and 1,12,729 ILP markers in *Corchorus olitorius* were identified, indicating wide intronic variation within the jute genomes. From these, 150 ILP markers were synthesised and validated for their amplification and polymorphisms across the released varieties. To enable long-term access and use by breeders and researchers, a Jute ILP Marker Database was developed, which stores markers with details such as genomic position, primer sequences, and allele information. This serves as the first large-scale ILP marker repository for jute and strengthens the molecular toolkit available for crop improvement in jute.

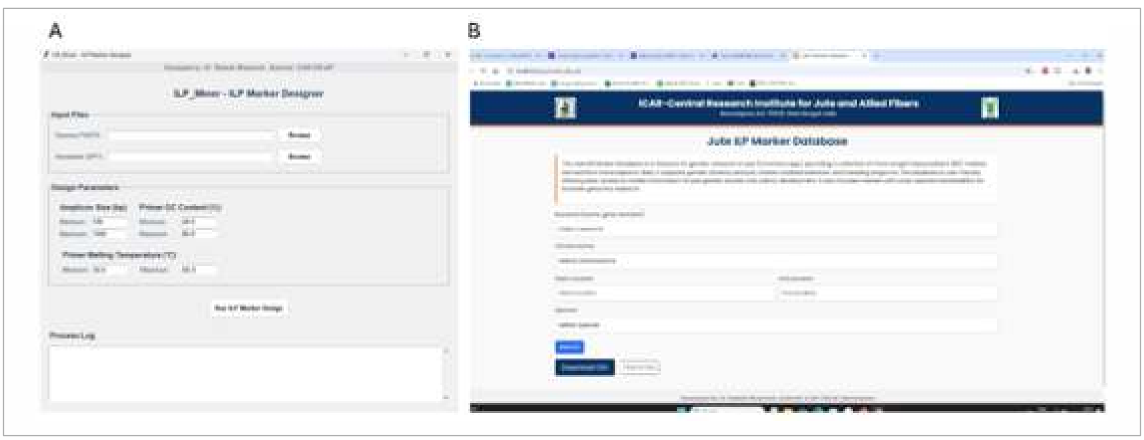


Fig. 6: A. Interface of ILP_Miner software which automates Intron Length Polymorphism marker discovery in the genome. B. Interface of Jute ILP marker database which stores genome wide distributed ILP markers in jute.

Development of SNP marker

Genotyping-by-Sequencing (GBS) was employed in this project to generate a high-density SNP marker resource for precise DNA fingerprinting of *Corchorus capsularis* varieties. GBS libraries were prepared by digesting genomic DNA with SphI and MluCI restriction enzymes to reduce genome complexity, followed by adaptor ligation, size selection and Illumina sequencing. The raw reads obtained were processed using the Ddocent pipeline, which includes quality filtering, de novo reference assembly, read alignment, and variant calling. Only SNPs that met stringent criteria (minor allele frequency [MAF] > 0.05, Phred quality score > Q30, and minimum allele read depth ≥ 10 ×) were retained for analysis. Through this workflow, a total of 16,321 high-quality SNPs were identified, representing one of the most comprehensive SNP datasets generated for this species to date. These SNP markers exhibited high polymorphism among jute varieties and were used to compute genetic distances, enabling hierarchical clustering and dendrogram construction, which clearly separated the released *C. capsularis* varieties into distinct groups. The strong discriminatory power demonstrated by the SNP dataset confirms its suitability for DNA fingerprinting, varietal purity testing, and IPR protection, while also creating opportunities for future studies in diversity analysis, trait mapping, and genomics-assisted breeding to improve fibre quality

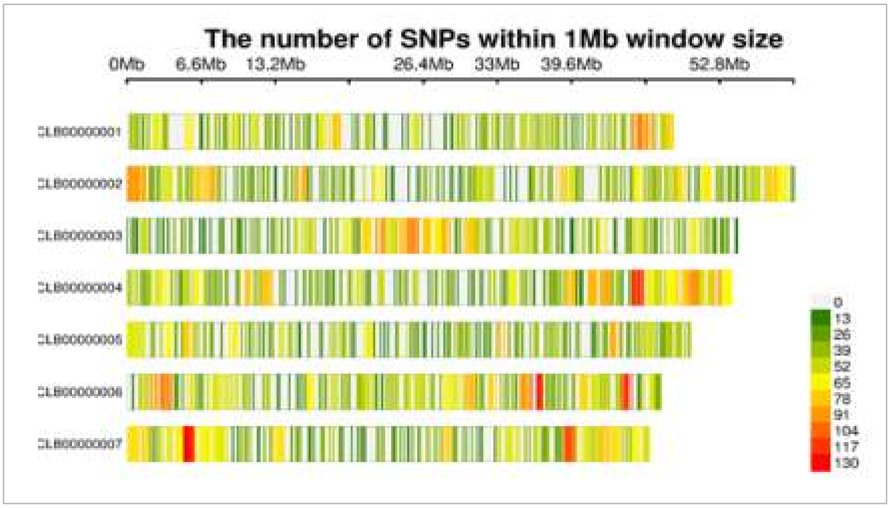


Fig 7: Distribution of 16321 high-quality SNP in seven *C. capsularis* genomes.

1.6 Molecular Mapping for Stem Rot Resistance in Jute (*Corchorus* sp.)

K. Meena, K. Mandal, S. Dutta and Thribhuvan R.

Project Code: In-house project JBT 5.0

Genotyping of F_2 plants

Stem rot disease is a major threat to jute cultivation, resulting in significant losses. Managing this disease under field conditions is difficult because of its complexity and ability to affect plants at any stage. In this study, genomic DNA was extracted from approximately 220 individual F_2 plants that descended from two different parents, P1 (resistant, WCIN 183A) and P2 (susceptible, OIN456). Random bulks were screened using 30 polymorphic markers (intron-linked polymorphic (ILP) based on previous parental polymorphism. The PCR amplification conditions were as follows: initial denaturation at 95 °C for 5 min; 35 cycles of denaturation at 95 °C for 45 s; annealing at 57 °C for 45 s; extension at 72 °C, and ten minutes of final extension at 72 °C. After separation on a 3% agarose gel containing ethidium bromide for 1.5 h in 1X TAE buffer, the amplified products were documented and analysed. As ILP markers are co-dominant, they can differentiate between both homo-and heterozygotes. Using two distinct ILP primers, genotyping the F_2 individuals revealed bands for lines 52, 64, and 66 that corresponded to the resistant parent. During phenotypic investigation, the same lines demonstrated resistance to *Macrophomina phaseolina*.

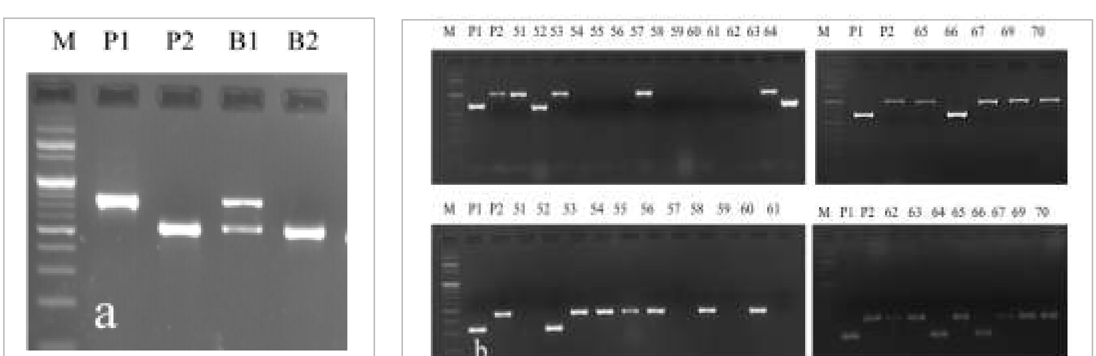


Fig 8: Representative image showing a) amplification of parental lines with different bulk samples; b) individual F_{2s} with ILP marker

2. Breeding for fibre yield, quality and other applications

2.1 Pre-breeding and breeding approaches for developing major biotic stress resistance in jute

J. K. Meena, K. N. Chourasia, K. Mandal and S. Satpathy

Project Code: In-house Project JB10.7

Screening for stem rot tolerance

The evaluation of jute genotypes based on lesion length revealed clear variability in disease response, allowing classification into distinct reaction groups. Genotypes exhibiting lesion lengths above 10 cm, such as Monalisa, CIN-021, JRC-412, UPC-94, CIN-014, CIN-019, CIN-022, and CIN-012, were identified as highly susceptible, while a large set of entries, including CIN-020, JRC-321, JRC-698, CIN-206, Padma, CIN-013, CIN-016, CIN-009, JRC-532, CIN-023 and several others showed lesion lengths between 8 and 10 cm and were categorised as susceptible. Genotypes with lesion lengths of 6–8 cm, including CIJ-150, JRC-212, CIJ-168, CIJ-151, CIN-36, CMU-55, CIN-347, and CIJ-148, were moderately susceptible, displaying intermediate but still substantial infection. In contrast, moderately resistant genotypes, such as CIN-001, CMU-43, CIJ-165, CIN-003, CMU-2, CIN-005, CMU-52, and CIN-002, exhibited lesion lengths of 4–6 cm, indicating improved pathogen restriction. The strongest resistance was observed in CMU-50, CIN-109, CMU-9, and CMU-49, which recorded lesion lengths below 4 cm and showed minimal lesion development. Overall, the results (Figure 9) highlight the presence of significant genetic variability in disease response among the evaluated materials and identify several promising genotypes that can serve as valuable resistance sources for future breeding and genetic improvement programs.

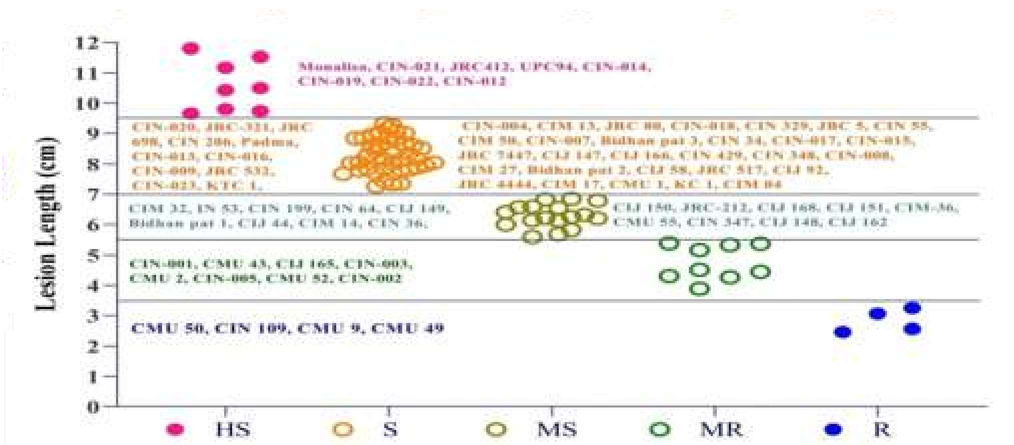


Fig 9: Grouping of genotypes of white jute based on lesion lengh for stem rot

Screening for yellow mite tolerance

A total of 100 jute germplasm lines were evaluated under field conditions following an augmented block design to identify potential sources of resistance against yellow mites. The assessment revealed considerable variation among the lines, with OIJ-136, OEX-011, OIN-082, OIN-008, and OIN-016 consistently exhibiting lower levels of mite infestation and reduced damage grades compared to the susceptible check JRO-204. These five genotypes demonstrated stable performance across seasons, indicating their reliability as resistance sources and potential usefulness in breeding programs aimed at developing yellow mite–tolerant jute varieties.

JRO-204

OIN-082

Fig 10. Yellow mite infestation in one resistant line (OIN 082) in comparion to suscestible JRO 204

2.2 Maximizing fibre productivity in Jute through genetic and agronomic approaches

Kumar Nishant Chourasia, J.K. Meena, J. Mitra, P. Satya, S. Sarkar, S. Mitra, Sourav Ghosh, R.K. De

Project Code : In-house Project JB 10.5

A Screening for waterlogging tolerance in jute

The screening for waterlogging tolerance was conducted to evaluate phenotypic performance under realistic stress conditions. As evidenced by the experimental visuals, genotypes were evaluated in Normal (N) control plots versus Waterlogged (W) treatment plots (Fig 1). To simulate severe flood scenarios and impose rigorous selection pressure, the field experiment followed a specific stress regime: a standing water depth of 30 cm was maintained starting from 55 days after sowing (DAS) and continuing until crop maturity.

Visual comparisons between normal and stressed plants revealed distinct adaptive mechanisms. While susceptible plants exhibited stunted growth and poor root development under these anaerobic field conditions, tolerant phenotypes demonstrated remarkable resilience, maintaining viable root systems and shoot vigor despite the long-duration water stagnation.

Fig 11: Waterlogging plot

Fig 12 : Control Plot

Quantitative Assessment: Tolerance Score Calculation

To quantify resilience objectively, a mathematical Tolerance Score was developed, modified from methodologies established by Sundgreen et al. (2018) and Xu et al. (2024). The assessment was based on seven key physiological parameters: Fresh Stem Biomass (FSB), Plant Height (PH), Basal Diameter (BD), Root Biomass (RB), Root Length (RL), Dry Stick Weight (DSW), and Dry Fibre Weight (DFW).

The calculation followed a two-step process:

1. **Percentage Reduction Calculation:** For every genotype and every parameter, the reduction caused by stress was calculated using the formula:

$$\textit{Percentage Reduction} = \frac{\textit{(Normal Value - Waterlogged Value)}}{\textit{Normal Value}} \times 100$$

2. **Tolerance Score Determination:** The Tolerance Score was defined as the arithmetic average of the percentage reductions across all seven parameters.

   This score represents the average percentage of performance loss. Consequently, a lower Tolerance Score indicates higher tolerance, reflecting a smaller biological impact from waterlogging stress.

Identification of Superior Genotypes

Based on the lowest calculated Tolerance Scores, the study successfully isolated the most resilient germplasm from the 92 evaluated lines. Selection B3-4/19 emerged as the top-performing genotype with a Tolerance Score of 13.45, indicating the highest stability across all traits. It was followed by WCIN-108 (14.59), OIN-0749 (14.84), and OMU-43 (15.96)(Figure).

A granular analysis of the top-performing genotype, Selection B3-4/19, reveals the specific physiological basis of its tolerance. While it experienced a 21.4% reduction in Dry Fibre Weight (DFW) and a 22.6% reduction in Dry Stick Weight (DSW), its Root Biomass (RB) remained virtually unaffected with a negligible reduction of only 0.1%. This suggests that the maintenance of root biomass is a critical mechanism for survival and recovery in waterlogged jute.

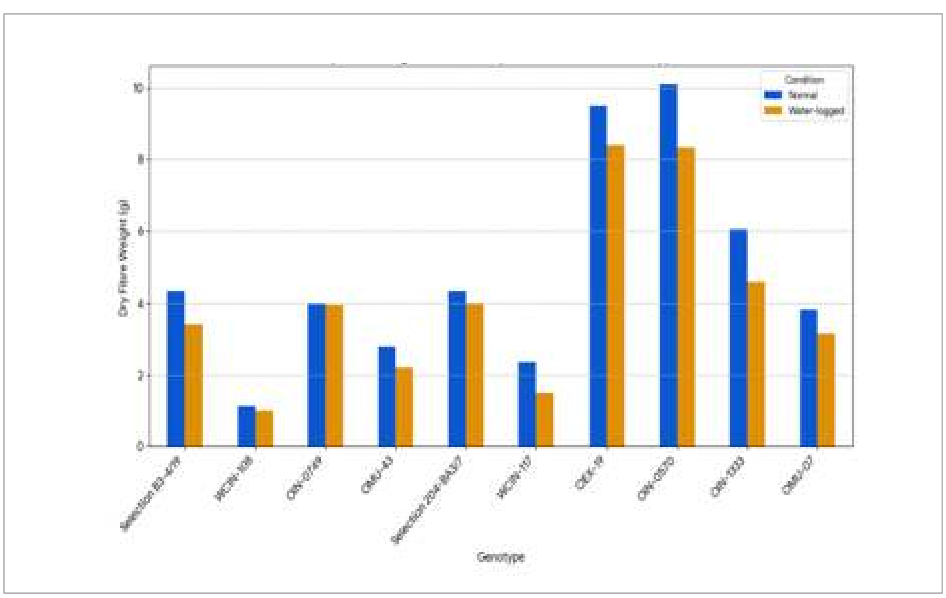


Fig 13. Dry fibre weight of tolerant jute genotypes

Multivariate Analysis (PCA) and Yield Performance

Principal Component Analysis (PCA) was utilized to understand the interrelationships between the reduction of different traits. The Biplot explains 73.26% of the total variance (PC1: 57.73%, PC2: 15.53%)(Fig.14).

- **Trait Correlation:** The analysis indicates that reductions in yield-related traits—Dry Fibre Weight (DFW), Dry Stick Weight (DSW), Fresh Stem Biomass (FSB), and Basal Diameter (BD)—are highly correlated and clustered together.
- **Distinct Mechanisms:** Interestingly, reductions in Root Length (RL) and Plant Height (PH) formed a distinct cluster, suggesting they represent a different dimension of sensitivity compared to root biomass.

Finally, a comprehensive comparison of Dry Fibre Weight (DFW) across all genotypes (Normal vs. Waterlogged) highlights the yield penalty associated with susceptibility. High-yielding varieties like JRO 204 exhibited severe yield crashes under stress (large gap between blue and orange bars). In contrast, the identified tolerant lines (e.g., Selection B3-4/19, WCIN-108) demonstrated yield stability, with minimized gaps between potential and actual yield under waterlogged conditions. This confirms that while some genotypes may have higher absolute yields under normal conditions, the identified tolerant lines offer superior reliability for flood-prone ecosystems.

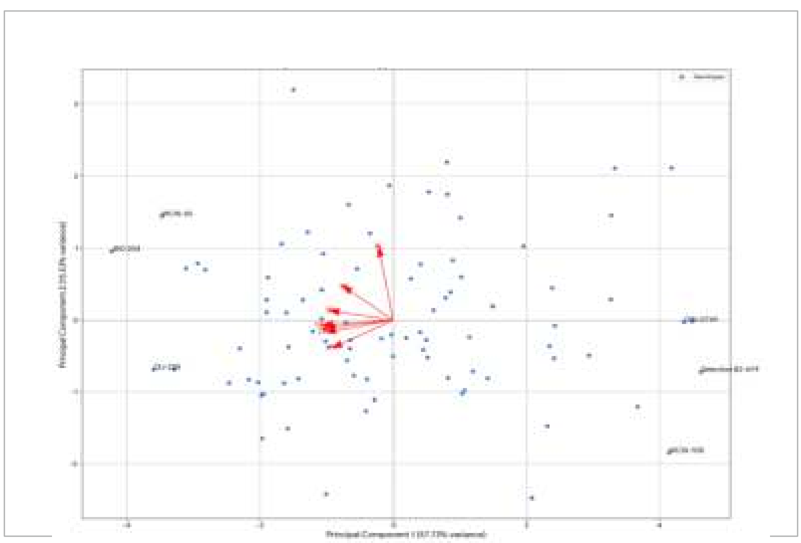


Fig 14. PCA Biplot of jute genotypes based on parameter reduction

B. Hybridization in Jute

Continuous hybridization in jute breeding is important task for incorporation of valuable gene in elite material and to create genetic variation. Selection JROKN-21/43, JROBA3, JROBA4 and JRO 524 were used to cross 5 promising F_5 family population and 3 high yielding germplasm (OIN 1155, OIN 0945, OIN 280). In total 53 crosses were attempted and among them 41 were successful. Similarly in white jute JRC 517, JRCP 6 and JRCP 7 were used to cross 5 promising F_5 family population.

C. Evaluation of segregating generation

Tossa jute : In *C.olitorius,* 47 lines of F_5 from ten crosses were evaluated; Table 1 provides the mean, range, and CV for important fiber-related characteristics. Plants of F5 generation exhibited variation for fibre yield (Fig. 15). F5 progenies exhibited promising traits such as stem rot resistance, non-branching and non-flowering

Table 1. Morphological characters F_4 generation

Characters	Range	Mean	CV(%)
Plant height (cm)	168-495	412	19.5
Basal Diameter (mm)	11.4-22.3	15.4	16.2
Fibre yield/plant (gram)	23-42.8	33.36	20.13

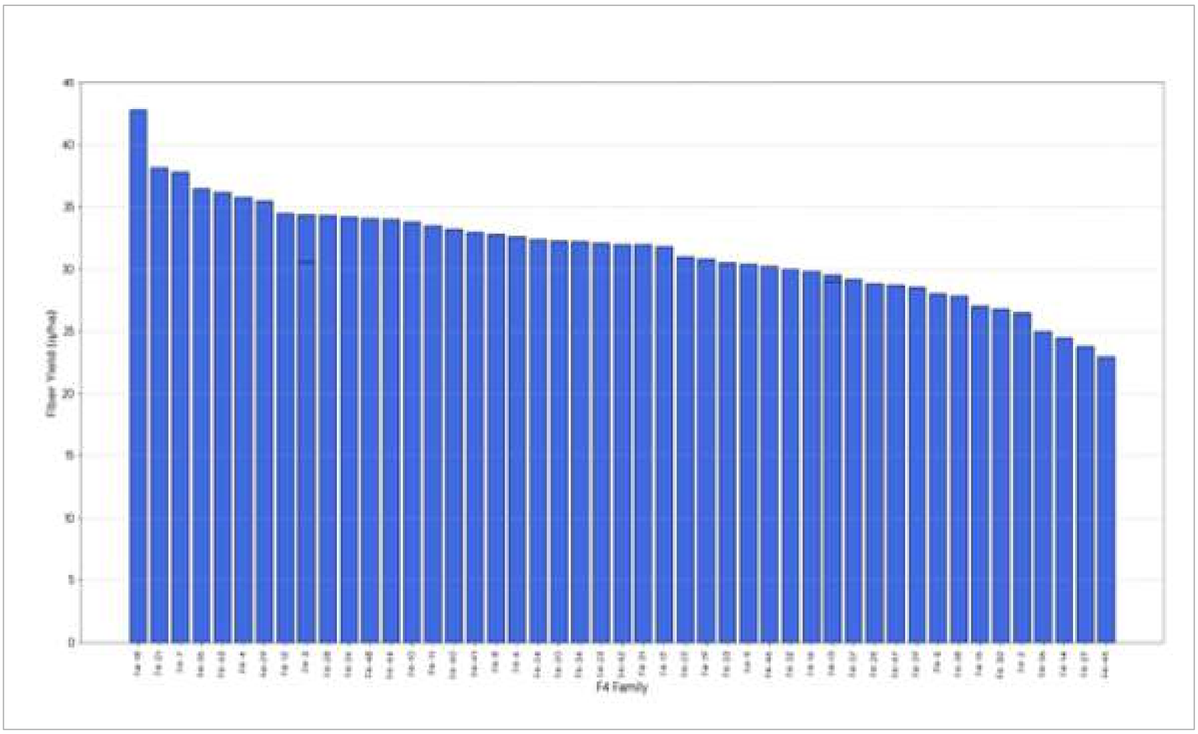


Fig 15. Fibre yield on tossa jute F_4 lines

White Jute : The study aimed to evaluate 45 F5 lines of white jute (*Corchorus capsularis* L.) for fiber yield and related traits to identify promising genotypes. Significant variability was observed among the genotypes for key traits, including plant height, basal diameter, green weight, stick yield, and fiber yield. Correlation analysis indicated a strong positive association between plant height and fiber yield. The results identified superior lines exhibiting high fiber yield potential, which can be advanced for further selection and breeding. Significant variation was observed among the 47 F5 lines for all traits ($p < 0.05$), indicating the presence of substantial genetic diversity. The highest fiber yield (37.5 kg/ha) was recorded in line F5-9, followed by F5-16 and F5-31, showing significant improvement over the check variety. Traits such as plant height and basal diameter were confirmed as indirect selection criteria due to their significant correlation with fiber yield. Superior lines identified in this study can serve as potential candidates for advanced trials and breeding programs.

2. 3 Development of a portable NIR-based approach for rapid assessment of chemical properties of fibre

R. Bandyopadhyay, P. Satya, D. Singh

Project code: Externally Funded Project NASF PA 10009

This study focused on establishing a rapid, non-destructive, and field-deployable method for assessing the key chemical components of jute fibre. Conventional laboratory-based estimation techniques are time-consuming, reagent-intensive, and impractical for large-scale or real-time monitoring applications. To address this challenge, the present study explored the use of portable near-infrared (NIR) spectroscopy in combination with chemometric analysis to estimate the major structural constituents of jute.

A large set of representative jute samples (n=120) was tested to capture the natural variability in fibre characteristics. Since the variability of lignin is narrow in jute cultivars, some samples were treated with delignification treatments to increase the range of variability. Cellulose and lignin contents were estimated using the Updegraff and acetyl bromide methods, respectively. Table 1 shows the statistics of the range of reference lignin and cellulose values. The samples were processed using standard laboratory protocols to obtain reference values for the important quality parameters. In parallel, spectral signatures were recorded using a portable NIR device that was designed and developed in-house. Basic preprocessing methods and multivariate statistical tools were employed to study trends, visualise sample grouping, and evaluate the potential of NIR-based predictions.

Table 2. Statistical analysis of lignin and cellulose content in jute samples (mg/g).

Quality attribute	Range	Mean	SD
Lignin	5.87-18.3	11.2475	3.94
Cellulose	33.96-80.35	58.30	8.76

The analysis demonstrated that the spectral information obtained from the jute fibres exhibited distinguishable patterns associated with their chemical composition. The spectral plot of the jute samples in the wavelength range of 950–1650 nm is presented in Fig. 16. Exploratory tools such as PCA and LDA showed meaningful grouping of samples, indicating that the NIR spectra are capable of capturing quality-related differences. Regression-based chemometric approaches were also investigated to establish predictive relationships. Initial results indicate that this technique holds strong promise for rapid screening and could significantly reduce dependence on conventional chemical analysis.

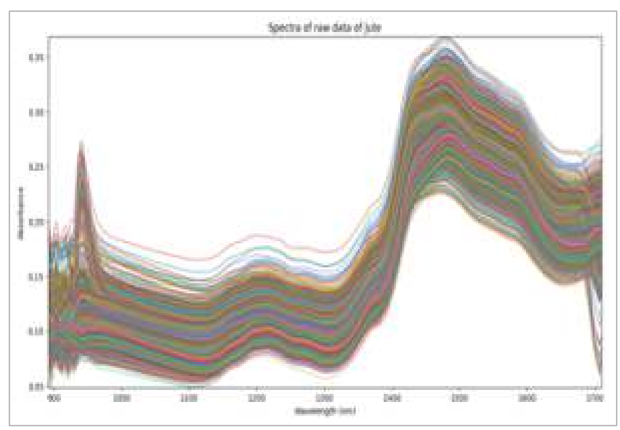


Fig. 16. Wavelength vs. absorbance plot of the original spectra of 120 samples

Calibration and prediction scatter plots of lignin content with the PLSR model using SNV preprocessing. Overall, this study highlights the feasibility and potential advantages of integrating portable spectroscopy with data-driven models for jute quality evaluation(Fig. 17). Further optimisation, validation with expanded datasets, and hardware–software integration will be the focus of future studies.

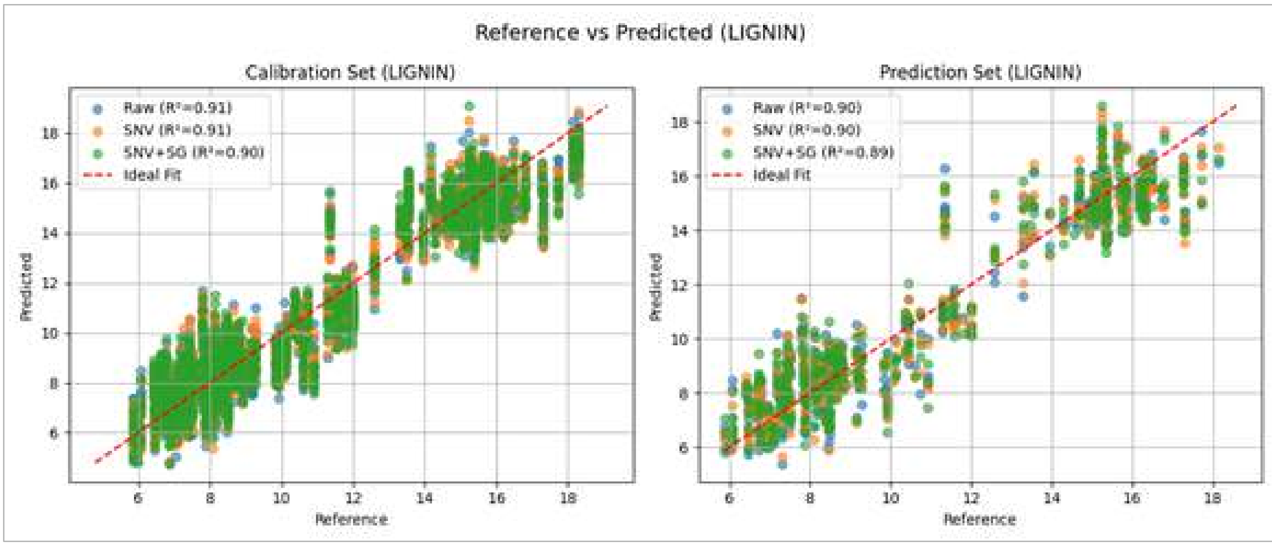


Fig. 17. Calibration and prediction scatter plots of lignin content with PLSR model using SNV preprocessing.

2.4 Development of pretreatment, saccharification and fermentation protocols for bioethanol production from jute and kenaf

P. Satya, L. Sharma, S. Roy, D. P. Ray and G. Kar

Project Code: Externally funded project NICRA

LF_S2, a strain of *Aspergillus fumigatus,* was isolated and characterised at the biochemical and molecular levels. The molecular identity of the isolate LF_S2 was determined by sequencing the internal transcribed spacer (ITS) region of the genome using universal primers ITS1 and ITS4. Nucleotide BLAST revealed that the 511 nt ITS sequence of LF_S2 shared 100% sequence identity with *A. fumigatus* accession KF020298.1. The genomic characterisation of this strain is currently in progress. Maximum reducing sugar production from alkali-pretreated jute biomass was achieved when saccharification was performed using a consortium of LF_S2 and MTCC 3192 at 25 °C with 2% biomass loading. Optimised Box-Behnken model ANOVA showed that all the linear components of the variables time, biomass load, and duration and the quadratic components of time and duration were significant. Microbial saccharification was found to be more effective than enzymatic saccharification using enzymes extracted from the same microbes, producing 20% higher reducing sugar than enzymatic saccharification. This increase in reducing sugar content is primarily attributed to higher cellulose digestion during the saccharification process. The optimisation of enzymatic saccharification resulted in the production of 21.7 g/L ethanol. Surfactant-assisted hot alkali pretreatments were developed for the rapid delignification of lignocellulosic biomass of jute, kenaf, and sugarcane. Triton X-100 was the most efficient surfactant, causing an average delignification of 74%. The time and surfactant concentration were crucial optimisation factors. Mass-balance analysis revealed that > 90% of the cellulose in the biomass could be recovered using this protocol, eliminating most of the lignin. To develop a safer and greener alternative to alkali pretreatment, organosolv pretreatment was conducted using reduced NaOH. Delignification of over 80% was achieved. The pretreatment optimisation method was standardised. Other ionic liquids and safer chemicals are being tested to refine this process. Fermentation protocol development using modified yeast strains is in progress.

Kenaf biomass pretreated with 2.5% NaOH showed maximum delignification (65%) and percent saccharification (85.2%) and high fermentable sugar (61.8 mg/ml). When NaOH pretreated biomass was exposed to laccase, 71.7% delignification was achieved. The addition of the mediator (HBT) to the enzyme further increased the delignification power to 73.1%. These findings highlight the potential of various green technologies for bioethanol production from fibre crops.

2.5: Genetic improvement of flax (*L. usitatissimum*) for higher fibre yield and productivity

J. Mitra, D. Saha and K. Mandal

Project code: In-house project JB 10.3

Evaluation of station trial in flax: Six lines at F_7 selected from the pedigree method of breeding were evaluated in a station trial with check JRF 2 following the RBD design with three replications (plot size: 6m X 6m). Fibre yield and its componential traits are presented in table.

Fig. 18 : Station trials of flax

Table3: Fibre yield and its componential traits in 6 lines selected from pedigree method in comparison to check JRF 2

Lines	Plant ht (cm)	Green wt/plot (kg)	Fibre yield/plot (kg)	Fibre yield (q /ha)
JRFJ 2025-1	116.78	64.32	5.57	15.45 II
JRFJ 2025-2	112.74	53.14	4.68	12.98
JRFJ 2025-3	105.55	55.02	5.08	14.08
JRFJ 2025-4	104.84	60.89	5.71	15.88 I
JRFJ 2025-5	110.74	60.00	5.40	15.00 III
JRFJ 2025-6	103.78	55.50	4.84	13.45
JRF 2(Check)	109.34	57.5	4.88	13.56
LSD	7.8	6.20	0.44	1.40

Three lines performed better than the check, namely JRFJ 2025-4, JRFJ 2025-1, JRFJ 2025-5, which are very superior promising genotypes that will be nominated for the AINPJAF coordinated trial IVT. Similarly, another station trial was conducted to evaluate six lines at M_8 (EMS-treated JRF 2) selected in mutation breeding through chemical mutagen separately following the RBD design with three replications (plot size: 6 m × 6 m). Fibre yield and its componential traits are given in table.

Table 4: Fibre yield and its component traits in 6 lines selected from mutation breeding in comparison to check JRF 2

Lines	Plant ht (cm)	Green wt/plot (kg)	Fibre yield/plot (kg)	Fibre yield (q/ha)
JRFJ M1	106.22	53.20	4.67	12.98
JRFJ M2	110.23	70.45	6.05	16.83 (II)
JRFJ M3	108.34	63.24	5.40	15.01
JRFJ M4	112.33	69.22	5.91	16.44 (III)
JRFJ M5	113.6	70.25	6.11	16.98 (I)
JRFJ M6	103,89	57.40	4.96	13.80
JRF 2(Check)	107.34	63.92	5.32	14.78
LSD	NS	6.07	0.59	1.50

Three mutant lines, namely JRFJM 5, JRJFM 2, and JRFJM 4, were found to be superior to the check JRF 2 and were thus nominated for the AINPJAF IVT trial.

Screening for wilt resistance

Ten flax accessions (FT-1006, FT-835 Purple, IC-96560, IC-96565, JRF-1, JRF-2, *L. africanaum*, *L. angustifolinum*, T-65 Blue, and T-66) were evaluated in a Rhizo *L. angustifolinum*, FT-1006 and *L. africanum* were observed to be comparatively resistant lines.

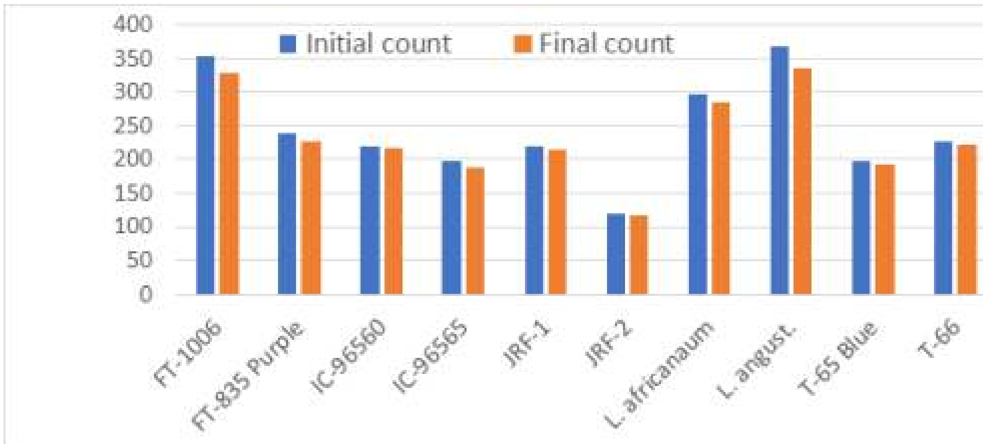


Fig. 19. Screening of flax accessions for milt rimifance

3. Genetic Resources and Crop Improvement

3.1 Introduction, maintenance, characterization and conservation of jute, mesta, sunnhemp, flax and ramie germplasm

J. Mitra, Thribhuvan R., S.K. Sarkar, A. Bera, R. Bhowmick and P. Divte

Project Code: In-house Project-JB 1.1

Breeders rely on broad genetic diversity to develop superior varieties with improved yields, fibre quality, and enhanced tolerance to biotic and abiotic stresses. The creation of such diversity cannot generally be achieved artificially, apart from limited gains through mutation breeding and genetic engineering. Instead, valuable genetic resources are developed over long periods through systematic exploration, collection, evaluation, characterisation, and conservation. As the designated National Active Germplasm Site (NAGS) for jute and allied fibre crops, ICAR-CRIJAF has continuously emphasised these core activities to strengthen and expand the germplasm base of JAF crops.

Conservation and maintenance

The medium-term storage facility at ICAR-CRIJAF, Barrackpore, currently maintains a total of 6030 accessions across major fibre crops, comprising 3434 jute, 1943 mesta, 284 sunnhemp, and 267 flax germplasm lines. The conserved collections are predominantly indigenous, with a smaller proportion of exotic accessions, representing the core native genetic variability available within the country. A substantial number of wild relatives, particularly within Corchorus, Hibiscus, Crotalaria, and Linum, also form an important component of the repository, enhancing opportunities for pre-breeding, trait diversification, and genetic enhancement programs.

In addition to medium-term storage collections, ramie (*Boehmeria spp.*) and sisal (*Agave spp.*) germplasms are conserved exclusively in field gene banks owing to their perennial nature. A total of 56 ramie and 46 sisal accessions are currently maintained in field gene banks located at the Ramie Research Station, Sorbhog (Assam) and Sisal Research Station, Bamra (Odisha). The species-wise distribution highlights the strong representation of *C. olitorius*, *C. capsularis*, *H. sabdariffa*, and *H. cannabinus*, whereas several wild and minor species remain limited in number, indicating priority areas for future exploration and collection efforts. The multi-panel graphical summary (Figure 20) presents the consolidated status of germplasm conservation of jute and allied fibre crops under the national mandate of the ICAR-CRIJAF.

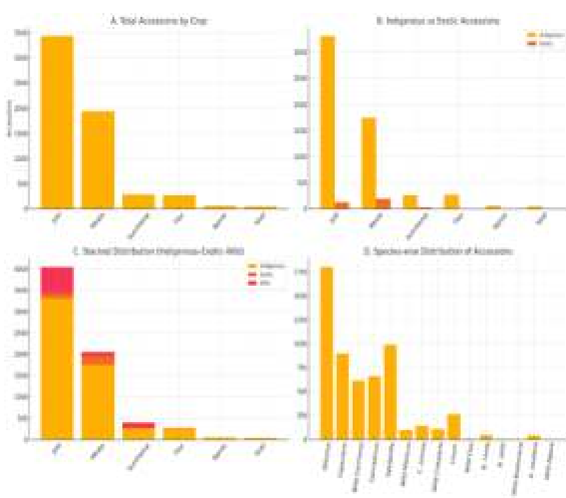


Fig 20: Overview of conserved germplasm diversity of jute and allied fibre crops at ICAR-CRIJAF. The figure summarises (A) total accessions by crop, (B) indigenous and exotic composition, (C) contribution of wild relatives, and (D) species-wise distribution across major fibre crops. Ramie and sisal germplasm are maintained in field gene banks at RRS, Sorbhog (Assam) and SRS, Bamra (Odisha).

Regeneration:

A total of 951 germplasm lines were regenerated in 2024–25. This included 19 early flowering accessions, 7 premature-flowering resistant accessions, 7 fine-fibre quality lines, 7 accessions for AINP entry, 123 olitorius core collection accessions, 45 exploratory collections, and 2 released varieties. In addition, material from NBPGR comprising 51 Crotalaria spp., 36 olitorius, 181 capsularis, 5 wild jute, 245 roselle, and 230 kenaf accessions was also regenerated. In the current year, the entire olitorius set was sown for regeneration.

Distribution:

A total of 3110 jute and kenaf germplasm lines were distributed to ICAR-CRIJAF and AINP-JAF scientists (Table 5).

Table 5. Species wise distribution status of JAF germplasm to indenters

Crop/Species	ICAR-CRIJAF	AINPJAF	Others/SAU
C. olitorius	2477	50	
C. capsularis	92	50	
Wild Corchorus spp.	20		
Roselle	106	57	10
Mesta	137	50	
Varieties	61		
Total	2893	207	10
Grand Total	3110		

Identification of trait-specific germplasm lines:

A four-year laboratory study on the larval development and feeding behavior of the jute semilooper Anomis sabulifera (Lepidoptera: Noctuidae) across ten wild germplasms of Corchorus tridens, C. pseudo-olitorius, C. aestuans, and cultivated jute (C. olitorius var. JRO 204) revealed significant variations in insect–host interactions.

- Wild germplasms WCIN 188 and WCIN 092 (C. tridens) and WCIJ 123 and WCIN 009 (C. aestuans) exhibited complete resistance, with 0% larval survival, weight gain, pupation, pupal weight, and adult emergence, indicating their status as least-preferred hosts.
- Conversely, WCIN 182 (C. pseudo-olitorius) was identified as the most susceptible germplasm, showing the highest larval survival (85.83 ± 1.72%), mean larval weight (193.64 ± 2.59 mg at 9

DAF), pupation (86.38 ± 0.82%), pupal weight (107.03 ± 2.46 mg), and adult emergence (82.4 ± 1.20%) rates.

- Biochemical analysis revealed a positive correlation between total protein content and larval survival, growth, pupation, and emergence, whereas total phenols and polyphenol oxidase showed a strong negative correlation, implicating their role in resistance through an antibiosis mechanism.

These findings highlight the potential of wild germplasms WCIN 188, WCIN 092, WCIJ 123, and WCIN 009 as valuable genetic resources for breeding resistance to A. sabulifera in jute improvement programs.

3.4 Protection of jute varieties and DUS testing

A. Bera and C. S. Kar

Project code: Externally funded project -PPVFRA

Ten varieties of two species of *Corchorus olitorius* (JROB-2, NJ-7005, NJ-7010, JRO-524, AAU-OJ-1, and REG/2022/0167) and *C. capsularis* (JRC-321, REG/2022/0166, RRPS-C-3, and Padma), were tested in the DUS trial during 2024-25 in the second-year testing cycle (Trial-I). Sowing was performed on 15.03.2024 at ICAR-CRIJAF, Barrackpore (Nodal centre) and on 17.03.2024 at ICAR-CSRSJAF, Bud Bud, West Bengal (Co-nodal centre). During the entire crop growth period, 17 DUS characteristics were recorded following the DUS test guidelines.

In both the *capsularis* and olitorius entries, plants were uniform with regard to the expression of traits. In the case of *capsularis* varieties (Trial-I 2nd year cycle), all four JRC-321, REG/2022/0166, RRPS-C-3, and Padma) were uniform in the expression of DUS characteristics. Most varieties can be distinguished based on stem colour (characteristic-6). The stem colour was coppery red in JRC-321 and Padma, red in RRPS-C-3, and purple in REG/2022/0166. These two varieties *viz.* JRC-321 and Padma could be distinguished with respect to seed size (extra-large 3.75 g in JRC-321 and large 3.39 g in Padma). The pigmentation of the calyx was green in RRPS-C-3 and red in JRC-321, REG/2022/0166, and Padma, although the RHS colour chart no. differed in REG/2022/0166. Pod pigmentation (characteristic-14) was green in RRPS-C-3 and red in JRC-321, REG/2022/0166, and Padma.

In the case of *olitorius* varieties, candidate variety REG/2022/0167 was tested along with five reference varieties (JROB-2, NJ-7005, NJ-7010, JRO-524, and AAU-OJ-1). Plant height (characteristic-8) was medium (301–400 cm) in REG/2022/0167, JRO-524, and AAU-OJ-1 and tall (> 400 cm) in JROB-2, NJ 7005 and NJ-7010. Fibre fineness (characteristic-9) was fine (2.81-3.22 tex) in NJ-7005 and NJ-7010 and very fine (<2.8 tex) in REG/2022/0167, JROB-2, JRO-524 and AAU-OJ-1 whereas fibre strength (characteristic-10) was fairly good (23.5-26.4 g/tex) in NJ-7005, average & weak (20.4 g/tex &below) in REG/2022/0167, fairly average (20.5-23.4 g/tex) in JROB-2, NJ-7010, JRO-524 and AAU-OJ-1 at both the centres. Most of these varieties were distinct from each other with respect to seed colour (characteristic-17) (JROB-2: black with red ridge and apex; NJ-7005: steel gray; REG/2022/0167: brownish gray (RHS: 200 A); NJ 7010: chocolate brown; JRO-524: black (203 A); AAU-OJ-1: steel gray.

In Trial II, the candidate variety JRCP-7 in 1st growing season could be distinguished from all other reference varieties based on their fibre strength, stipule colour, and pod pigmentation pattern. With respect to fibre strength, JRCP-7 had average and weak (17.9 g/tex and below) fibre, while JRC-532, JBC-5, and Bidhan Pat-3 had fairly average (18.0-20.9g/tex) fibre. JRCP-7 had stipules with red tips, while the reference varieties, viz. JRC-532, JBC-5, and Bidhan Pat-3 had green stipules. JRCP-7 showed light red pod pigmentation, JRC 532 had pods with light red grooves, JBC-5 had deep red grooves, and Bidhan Pat-3 had green pods. The leaf petiole colour was red in all varieties except Bidhan Pat-3.

The candidate variety JROP-4 (C. olitorius) in 1st year growing season could be distinguished from the reference varieties based on leaf vein colour, fibre strength, seed size, and seed coat colour. S19 and JRO-2407. The leaf vein colour was green in JROP-4, whereas it was red in S19 and JRO-2407. With respect to fibre strength, JROP-4 had fairly average (20.5-23.4g/tex) fibre, while S19 and JRO-2407 had fairly good (23.5-26.4 g/tex) fibre. Seed size was Medium (2-3 g 1000 seed weight) in JROP-4, while it was small (< 2 g 1000 seed weight) in both S19 and JRO-2407. The seed coat colours of JROP-4, S-19, and JRO 2407 were steel gray, black, and green, respectively.

For maintenance of reference collection of jute, thirty one varieties of tossa jute, viz., JRO 204, IRA, JRO 632, JRO 3690, JRO 66, JRO 524, JRO 7835, JRO 878, JRO 8432, S 19, JRO 128, JRO 620, JRO 36 E, Chinsurah Green, Sudan Green, Tanganyika 1, JRO 2345, KOM 62, TJ 40, CO 58, JRO 2407, Tarun, JBO 1, JROG 1, NJ7010, NJ 7050, NJ 7055, Bidhan Rupali, JROM 1, NJ 7005 and JROB 2 and twenty two varieties of white jute, viz., JRC 212, JRC 80, JRC 698, JRC 7447, JRC 4444, Padma, JRC 321, Monalisa, UPC 94, Bidhan Pat 1, Bidhan Pat 2, Bidhan Pat 3, KC 1, KTC 1, D 154, JRC 517, JRC 532 , JBC 5, JRCM 2, KJC 7, JRC 9057 and JRCJ 11 were sown through plant to progeny row method at both ICAR-CRIJAF, Barrackpore and ICAR-CSRSJAF, Bud Bud. A database of the reference collection was prepared after recording observations of 17 essential characters.

One tossa jute variety, JROB 2, has been registered for protection (date of grant of certificate-05.12.2024) after completion of DUS testing. Application for the registration of JRC 9 as an extant notified variety has been sent to the PPVFR authority and is currently under DUS trial during 2024-25.

Fig. 21. Difference in stem colour in capsularis varieties in 2nd cycle of testing

Fig. 22. Difference in seed colour in olitorius varieties in 2nd cycle of testing

Fig. 23 Difference in pod colour in capsularis varieties in 1st cycle of testing

Fig. 24 Difference in seed colour in olitorius varieties in 1st cycle of testing

3.5 Development of DUS test guideline in kenaf and roselle

A. Bera and C. S. Kar

Project code: Externally funded project -PPVFRA

During 2024-25, 22 characters (hypocotyl pigmentation, leaf lobing pattern, leaf vein colour, leaf petiole pigmentation, leaf collar colour, Leaf Pubescence, Stipule colour, stem colour, stem pubescence, presence of spine on stem, stem branching habit, plant height, fibre strength, fibre fineness, flower petal colour, flower eye zone colour, flower stigma colour, fruit colour, fruit pubescence, calyx length, seed coat colour, and thousand seed weight) were found to be stable and uniform in expression over the years. Based on these observations, the DUS test guidelines were prepared and published in the Plant Variety Journal of India (Vol.18 No. 12 December 2024). Subsequently, the mesta (kenaf and roselle) crop was notified in the Gazette of India, vide S.O. 1869(E) dated 22.04.2025 for the registration of varieties under the PPVFR Act, 2001. Seeds of all the reference varieties/lines were multiplied for maintenance. The project was concluded, and as a result, ICAR-CRIJAF, Barrackpore, was identified by PPVFRA as the Nodal Centre for DUS testing of mesta in the form of the project 'Protection of Mesta Varieties and DUS Testing'.

4. Seed Production

4.1 Quality Seed Production of Jute and Allied Fibres

C. S. Kar and A. Bera

Project code: Externally funded project AICRP on Seed (Crops)

Production and distribution of breeder seeds of all the national varieties of jute, mesta, and sunnhemp as per the indent and allotment of the Seed Division of the Department of Agriculture & Farmers Welfare (DAC), Ministry of Agriculture, Govt. of India is the key mandate for this project. Nucleus seeds for all the released varieties of jute and allied fibre crops are produced and maintained at the CSRSJAF, Budbud. Breeder seeds of jute and allied fibres are supplied to different indenting agencies in the country. The production of quality (certified and truthfully labelled) seeds of other crops such as paddy, wheat, mustard, and dhaincha and their direct supply to farmers is another major activity.

Breeder seed production of Jute, Mesta Sunnhemp, and flax: A total of 18.87 q breeder seeds of 14 varieties (eight olitorius and six capsularis) of jute, four varieties of mesta (Kenaf), three varieties of sunnhemp, and one variety of flax were produced as per an indent of 14.25 q. To fulfil the 7.45 q indent of the DA & FW (2025-26) 11.15 q of breeder seeds of indented varieties of jute, mesta, and sunnhemp were produced during Kharif 2024. To meet the demand of other agencies, 2.72 q of breeder seed of nine jute, 0.50 q of two mesta (kenaf), and 4.5 q of flax variety JRF-2 were produced against an indent of 1.30q, 0.50q, and 5 q, respectively. The variety-wise details are provided below.

Table 6: Breeder Seed Production of Jute & Allied Fibre crops against DA&FW indent 2025-26

Variety	Notification Year	DAC Indent (q)	Production(q)
Jute			
JBO 2003 -H	2008	0.05	0.05
JRC-212	1978	0.05	0.10
JRO 204	2007	1.15	1.20
JROMU -1	2020	0.10	0.10
JRCP-5	2023	1.00	1.50
	Total	**2.35**	2.95
Mesta			
JBMP 5	2023	1.00	1.10
JRHC-3	2020	0.10	2.00
	Total	**1.10**	**3.10**
Sunhemp			
SUN-3	2019	0.50	1.00
JRJ-610	2015	1.50	1.60
SUN-053	2009	2.00	2.50
	Total	**4.00**	**5.10**
Total	**DA&FW indent**	**7.45**	**11.15**

Table 7: Breeder Seed Production of Jute & Allied Fibre crops against Other Indents 2025-26

Variety	Notification Year	Other/State Indent	Production (q)
JUTE			
JRC -517	2009	0.10	0.17
JRC -532	2009	0.05	0.05
JRC -698	1999	0.10	0.10
JRCJ -11	2021	0.10	0.10
JRO -8432	1999	0.10	0.05
JROB -2*	2020	0.40	1.50
JROBA -3*	2023	0.20	0.25
JRO -524	1977	0.15	0.40
JROG -1	2014	0.10	0.10
	Total	**1.30**	**2.72**
Mesta			
JBMP -2	2016	0.20	0.20
HC -583	1967	0.30	0.30
Total		**0.50**	**0.50**
	Total Kharif	**9.25**	**14.37**
Flax			
JRF -2	2017	5.00	4.50
Total		**5.00**	**4.50**

*** Supply of Commercialized Varieties is restricted to agencies having MoU based License from ICAR-CRIJAF**

During 2025, the jute variety JROBA3 was commercialised and licenced to two private agencies. Balaji Seeds, Hyderabad, and Sri Krishna Seeds Kurnool through nonexclusive licencing for five years.

Grow Out Test:

grow-out test (GOT) was conducted to check the genetic purity of the breeder seeds of all the intended varieties of jute. The percentage of off-types present in the varieties was recorded by making critical observations of the important morphological parameters (*i.e.* leaf shape, leaf- or stem- pigmentation, flowering, capsule/pod, seed coat, *etc.*). GOT was performed from March to May 2025 before supplying the breeder seeds. The percentage of off-type present in each of the jute and allied fibre varieties was within the permissible limit.

Production and Maintenance of Nucleus Seeds:

Seeds harvested from selected individual true-to-type plants of a variety were used to raise progeny rows. Progeny rows found to be true to the type of varieties (jute, mesta, and sunnhemp) were bulked to constitute nucleus seeds. Off-type plants found in any progeny row of nucleus seed plots, entire progeny row was eliminated to obtain purest seeds. A total of 573.6 kg of nucleus seeds of the 59 released varieties of jute (253.60 kg), 33 varieties of mesta (115 kg), nine varieties of sunnhemp (157 kg) during kharif, and flax (50 kg of JRF-2) during rabi were produced and kept safely for breeder seed production in 2025.

Table 8: Nucleus seed production of jute 2024-25

S. No.	Variety	Production (kg)	S. No.	Variety	Production (kg)
Jute-*olitorius*			Jute-*capsularis*		
1.	JROBA-3	10.5	1.	JRCP-5	3
2.	JRO-204	4.5	2.	JBC-5	4
3.	JRO-524	2.0	3.	JRCJ-11	7.5
4.	JROG-1	1.5	4.	JRC9057	2
5.	JROB-2	12.0	5.	JRC517	9.5
6.	CO-58	3.0	6.	JRC532	3
7.	JBO-2003H	3.5	7.	JRC4444	6
8.	JRO-2407	3.5	8.	JRC7447	7.5
9.	JROP-4	3.0	9.	JRCP-2	7
10.	JROM-1	2.5	10.	JRCP-7	10
11.	JROMU-1	3.0	11.	JRC-321	7.5
12.	JROV-5	4.0	12.	JRC698	8
13.	S-19	6.0	13.	JRC212	6.5
14.	JRO-620	5.5	14.	JRC80	3.5
15	JRO-66	4.5	15	KC-1	2.5
16.	KOM-62	5.1	16.	UPC-94	1.6
17.	Tarun	1.5	17.	Monalisa	5.5
18.	Sudhan Green	5.5	18.	Bidhan Rupali	1.8
19.	JRO-128	6.5	19.	Bidhan Pat-1	1.2
20.	JBO-1	5.0	20.	Bidhan Pat-2	1.5
21.	JRO-632	5.5	21.	Bidhan Pat-3	1.8
22.	JRO-3690	6.0	22.	Padma	2.1
23.	JRO-2345	5.2	23.	KJC-7	1.8
24.	Tanganika-1	5.6	24.	D-154	2
25.	TJ-40	5.0	25.	KTC-1	1.6
26.	JRO-878	4.3	26.	AAUCJ-2	1.6
27.	JRO-7835	5.0	27.	BCCC-1	1.5
28.	Chinsura Green	5.0			
29.	NJ-7010	3.0			
30	BCCO-6	2.0			
31	KRO-4	1.7			
32	NJ-7005	1.2			
	Total	**142.10**		**Total**	**111.50**

Table 9: Nucleus seed production of Mesta 2024-25

S. No.	Variety	Production (kg)	S. No.	Variety	Production (kg)
Mesta-*Kenaf*			Mesta-*Roselle*		
1	JRHC-3	4	1	AMV-1	2.4
2	JBMP-6	5	2	AMV-2	1.3
3	JBMP-5	1.0	3	AMV-3	1.4
4	JRKM9-1	4.5	4	AMV-4	1.4
5	AMC108	2.5	5	AMV-5	1.3
6	MT150	3	6	AMV-7	1.6
7	HC583	5	7	AMV-8	1.3
8	JRM-3	3.7	8	AMV-9	3.6
9	JRM-5	3.3	9	AMV-10	2.3
10	JBMP-2	2.4	10	GR-27	3.8
11	JBMP-3	2.7	11	CRIJAF R-5	3.2
12	JBMP-4	2.8	12	CRIJAF R-8	1.1
13	JBM-71	2.5	13	JRR17	5.0
14	JBM-81	3.6	14	HSLC-1	8.0
15	JBMG-4	4	15	JRHS-1	3.5
16	JBM-2004(D)	1.3	16	HS4288	14.0
			17	HS7910	8.5
	Total	**51.3**		**Total**	**63.7**

Table 10: Nucleus seed production of Sunhemp and Flax 2024-25

S. No.	Variety	Production (kg)
Sunnhemp		
1	JRJ 610	16
2	SUN 03	24
3	SUIN 037	17
4	SUIN 053	12
5	SH 4	15
6	K 12 (Black)	18
7	K 12 (Yellow)	16
8	TYPE 6	11
9	SJ 67-42	28
	Total	157
Flax		
1	JRF -2	50

Quality Seed Production JAF and other Crops:

Seeds of different crops were produced under this project for distribution to farmers. TL seeds of the flax variety JRF-2 were also used. Approximately 924.85q of quality seeds were produced. A detailed list is provided below.

Table 11: Quality Seeds produced during 2024-25

SL	Crop	Variety	Seed class	Quantity (q)
1	Wheat	DBW-187	TL	25.95
2	Paddy	MTU-7029, IET-4786, MTU-1153	Certified	876.75
3	Mustard	B-9, PM-30	TL	5.01
4	Mungbean	Pusa 1431, Virat, Surya, Sona	TL	0.61
5	Jute	JRO 204, JROB-2, JROBA-3, JRO-524	Foundation	0.80
		JRO 204, JRC-517, JRC-698, JRCJ-11, JROBA-3, JRO-524, JROG-1	TL	1.12
6	Sunnhemp	SUN03, SUN053, JRJ610, SUN037, SH-4	TL	8.30
7	Dhaincha	Local Variety	TL	5.00
8	Flax	JRF-2	TL	1.31
			Total	**924.85**

5. Promotion of new varieties

Promoting newly released jute varieties in farmers' fields and exploring their seed production potential in West Bengal

S. Kumar, C. S. Kar, M. L. Roy, S. Ghosh and R. K. De

Project code : In house Projetct JEXA 6.4

Field demonstrations(28 nos.)of cv. JROB 2 were conducted during mid April at Surjapur (Barrackpore I Block), Ula and Kalsara (Barasat I Block) of North 24 Pargana district This variety is suitable for fibre as well as biomass production (paper-pulp industries). It is also resistant to the yellow mite, stem weevil and hairy catterpiller. JROB 2 produced 6.51-8.07 % more fibre (due to more height and longer basal diameter) than the commonly grown variety (JRO 524) by the farmers. Maximum fibre yield was obtained at Kalsara (Figure 25). Also, highest net return of Rs.1,22,257/ ha was achieved at Kalsara. The total cost of cultivation in demonstration plots varied from Rs. 1,09,215/ha - Rs.1,13,047/ha.

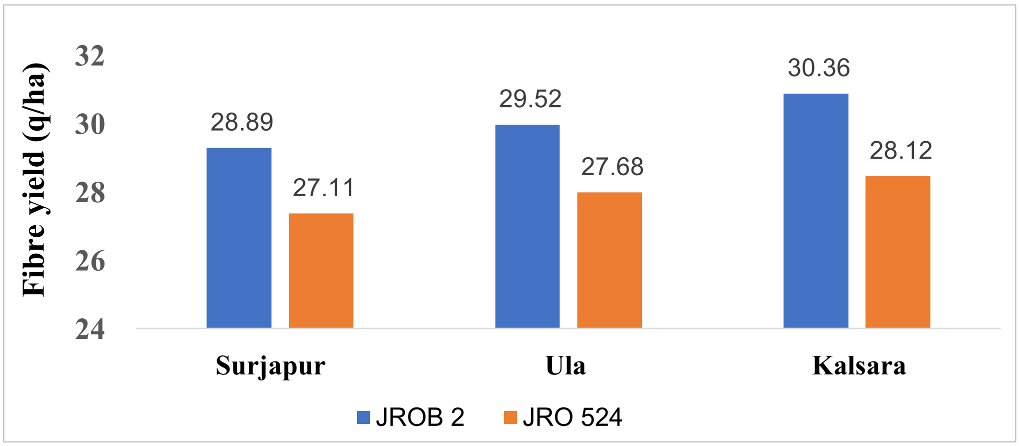


Fig.25: Fibre yield of JROB 2 in North 24 Parganas

Four field trials of jute seed production (cv. JRO 204) along with ICAR-CRIJAF experimental farm were initiated during mid September. Two places namely, Badshanagar (Naoda Block) Murshidabad and Taraberia (Amdanga Block) North 24 Parganas were selected for it. Participating farmers were explained about the details of the seed production process of jute. Accordingly, the isolation distance, timely roguing of off-types and management of weeds prior to seed formation were done in order to maintain the quality of jute seed. Appropriate prophylactic measures were also taken up to discourage the infection of seed borne pathogen.

Jute seed crop at Taraberia, (North 24 parganas)

Jute seed crop at Badshanagar (Murshidabad)

Jute seed crop at ICAR-CRIJAF, Barrackpore

Fig.26: Performance of jute seed crops

CROP PRODUCTION

Overview

JAF growing tracts of India are classified into nine agro-climatic zones comprising of the alluvial and red & lateritic soils and sandy loam to clay loam in texture. Alluvial soils are derived mainly from the deposition of the Ganges and the Brahmputra river systems and carry ample potash and phosphoric acid. They are, however, deficient in nitrogenous and organic compounds, resulting in low soil fertility and nitrogen use efficiency. JAF is predominantly grown as a rainfed crop by the marginal and small farmers. Drought, cyclone, insufficient quantity of retting water, and weed infestation are the most important issues in the changing climatic scenario, so, the Crop Production Division has been taken scientific research programmes aiming to develop economically viable and sustainable JAF production system.

Priorities & Thrust Areas

- Maintenance of soil health, recycling of organic wastes, and improvement in fertilizer use efficiency
- Microbial formulation for improved retting resulting in fibre quality to meet industrial requirement
- The carbon sequestration research for sustainable management of soil resources
- Integrated weed management, conservation agriculture, tillage and nutrient interactions
- Crop simulation, energy efficient farming, economising cost of cultivation & drudgery reduction

Research Highlights of 2025

- Long-term studies at CRIJAF have demonstrated the effectiveness of integrated nutrient management strategies for bast fibre crop production systems. The treatment of 100% NPK + FYM proved most effective in the jute-rice-wheat rotation for optimizing crop yields and maintenance of soil quality.
- Combining 50% NPK fertilizer with 50% compost substantially increased carbon pool management index and soil organic carbon sequestration rates in jute, flax, and ramie cultivation.
- Efficient irrigation practices like sprinkler irrigation at 50% DASM optimized water and energy usage while maximizing system productivity in jute by 37-41%.
- Capsularis jute variety JRC J11 showing better tolerance to early waterlogging becouse of better root traits and antioxidative response.
- In sisal, combining large suckers with high fertilizer doses yielded maximum fibre. INM treatments in flax boosted yields by 85-110%.
- Eddy covariance analysis confirmed jute's role as an effective net carbon sink crop.
- Bioethanol production using lignocellulosic feedstocks from jute and kenaf impressively reduced GHG emissions by 78-81%.
- Free-flowing retting with CRIJAF Sona in proved to be efficient & quality oriented retting system.
- The Jute-ICARE project reached 2.65 lakh hectares benefiting 5.8 lakh farmers, with yield gaps bridged by 43-74% using CRIJAF technologies.
- Mechanization efforts led to the development of efficient machines like a power-operated jute ribboner, modified nail weeder, battery-operated weeder, and multi-crop seed drill for bast fibre crop production.

1. Soil and Water Productivity

1.1 Changes in soil quality and crop productivity under long term fertilizer experiment

B. Majumdar, S.P. Mazumdar, S. Saha, R. Saha, K. Mandal and D. Datta

Project Code: External Funded Project - AICRP-LTFE

The long-term fertilizer experiment, initiated in 1971, aimed to evaluate the effects of continuous fertilizer applications on crop productivity, nutrient uptake, and soil health in a jute-rice-wheat cropping system. The 100% NPK + FYM treatment recorded the highest yields of jute (37.0 q/ha), and rice (47.8 q/ha) during 2025 among all the treatments and recorded 35.80 q/ha of wheat (2024-25) reaffirming the superiority of integrated nutrient management in sustaining productivity (Fig 1 & 2). This was closely followed by the 150% NPK treatment which was at par with 100% NPK + FYM for jute (35.2 q/ha) and wheat (36.7 q/ha) yields but significantly lower yield of rice (42.8 q/ha). The recommended dose (100% NPK) recorded moderate yields of wheat (32.20 q/ha), jute (31.4 q/ha), and rice (36.3 q/ha). In contrast, imbalanced nutrient applications viz. 100% NP and 100% N resulted in noticeably reduced productivity of crops and the control plot (no fertilizer) recorded the lowest yields for all crops- 6.40 q/ha (wheat), 11.50 q/ha (jute) and 10.80 q/ha (rice) highlighting the critical dependence of the system on nutrient inputs. Interestingly, the 100% NPK + Zn treatment did not offer any additional yield benefit over 100% NPK alone, indicating limited micronutrient response under the prevailing soil conditions.

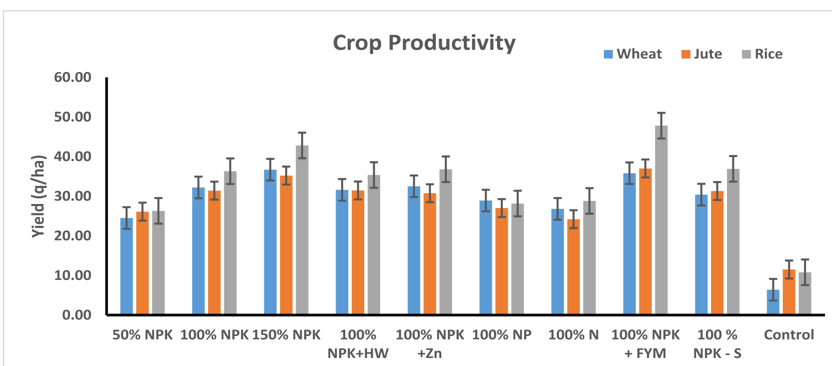


Fig. 1. Effect of different fertilizer treatments on crop productivity of wheat, jute and rice

In terms of soil health, 100% NPK + FYM treatment (Fig 2) recorded the highest organic carbon content (0.90 g/kg), significantly improving soil fertility. This treatment also recorded the highest soil available nitrogen (357.5 kg/ha), while the 150% NPK treatment recorded the maximum levels of available phosphorus (77.2 kg/ha) and potassium (252.70 kg/ha). However, phosphorus depletion was observed in treatments like 100% N and the control.

Fig. 2. Field view of control and 100% NPK + FYM treated rice plots

Soil biological activity varied significantly across fertilizer treatments, and 100% NPK + FYM (Fig. 3) recorded the maximum FDA (35.50 µg fluorescein /g/h), DHA(17.39 µg TPF/g/h), acid phosphatase (282.17 µg pNP/ g /h), alkaline phosphatase (567.33 µg pNP /g/h), and SMBC (426.20 mg/kg), closely followed by 150% NPK. Balanced fertilization (100% NPK) maintained moderate enzymatic activity while imbalanced nutrient treatments such as 100% NP and 100% N showed reduced microbial activity. The control consistently exhibited the lowest values across all parameters, confirming the essential role of nutrient inputs in sustaining soil biological health.

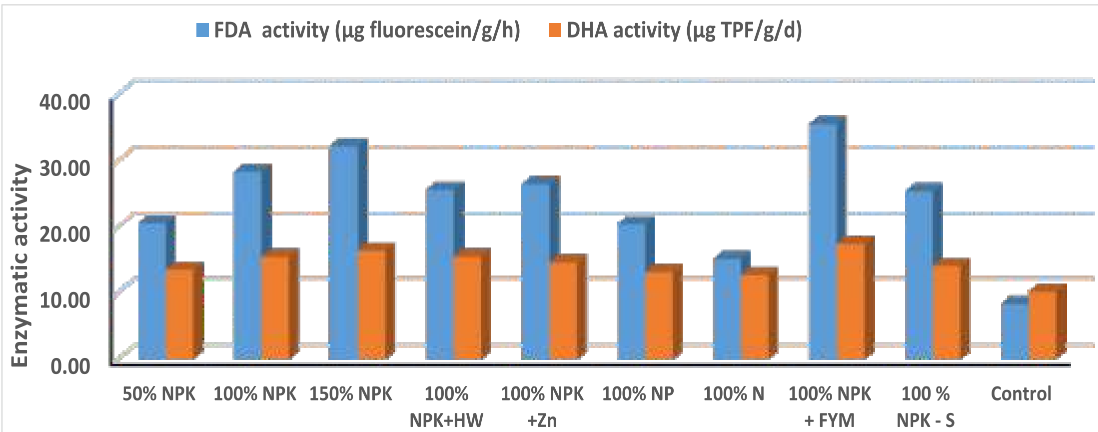


Fig. 3. Long-term effect of manure and fertilizer use on biological properties of soil.

1.2 Soil test and resource based integrated plant nutrient management

S.P. Mazumdar, B. Majumdar, N.M. Alam, S. Ghosh, and S. Sarkar

Project Code: External Funded Project- AICRP-STCR

Soil test based targeted yield (ST-TY) equation for mesta was developed (Fig 4) by taking into account the nutrient requirement and contribution of N, P and K from various nutrient sources (soil, fertilizer and FYM). During the 2024-25 season, the verification trial for garlic was conducted at Balagarh, Hooghly district. The verification trials of garlic (Fig 5) achieved the targeted yield of garlic (70 q/ha) with the application of inorganic fertilizer on the basis of ST-TY with and without FYM. These findings showed the efficacy of the proposed equations and highlight the potential for integrated fertilizer strategies in optimizing garlic yields in the region.

Fig.4. Field experiment conducted to develop soil test based targeted yield equation for mesta

Fig.5. Verification Trial for garlic at Balagarh, Hooghly

A long-term study revealed that ten years of ST-TY based integrated nutrient management (INM) enhanced soil health and bacterial community structure and composition, leading to sustainable crop yields in jute-rice-lentil cropping system. Notably, the bacterial community analysis identified key phyla, including *Proteobacteria*, *Planctomycetota Chloroflexi, Bacteroidota, Actinobacteriota, Acidobacteriota, Firmicutes, Myxococcota* and Verrucomicrobia, (Fig 6a) many of which play critical roles in nutrient cycling and plant growth promotion. The biological soil health index (BSHI) was highest in the INM treatment, with average contributions from *Azotobacter* (22.7%), *Bacteroidota* (12.1%), *Actinobacteriota* (21.9%), very labile organic carbon (23.1%), and labile organic carbon (20.2%) to BSHI (Fig 6b). Structural equation modelling contributes to the assessment of factors related to biological soil health, and it reveals the relationship between biological soil health and soil biological indicators influencing it and *Planctomycetota (Pln), Bacteroidota (Bct), and Myxococcota (Myx),* are the most related to biological soil health, but other variables also contribute.

Fig.6 (a) Relative abundances of ten dominant bacteria at the phylum level under different nutrient management treatments - control, inorganic, and integrated treatment in rice-lentil-jute cropping system

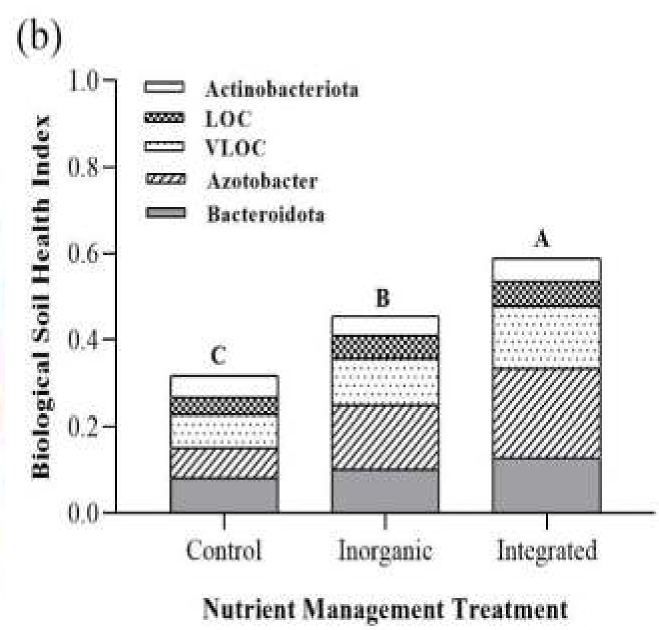


Fig. 6 (b) Effect of different treatments on biological soil health index (BSHI) and individual contribution of the indicators to the overall index value

1.3 Comparative efficiency of P- and K- solubilizing rhizobacteria and nitrogen fixers on jute seed germination and seedling growth under *In-vitro* condition

Lavanya A. K., Sanjoy Saha, S. Datta, S. K. Sarkar and D. Datta

Project code: In-house project-JA 8.7

To study the comparative efficiency of seed inoculation with rhizobacterial isolates, *Corchorus olitorius* jute variety, JRO-204 was used. The seeds were surface sterilized before rhizobacterial treatment with 1% H_2O_2 for 1 minute, followed by 75% ethanol for 1 minute, and then rinsed 5–6 times with sterile distilled water. The five potential rhizobacterial isolates of phosphate solubilizers were JRPS – 123, JRPS – 335, JRPS – 60, JRPS – 97 and JRPS – 347, potassium solubilizers were JRKS – 287, JRKS – 231, JRKS – 240, JRKS – 169 and JRKS – 361and nitrogen fixers were JRNF – 3, JRNF – 5, JRNF – 8, JRNF – 11, JRNF – 16. The inoculated seeds were treated with nutrient broth containing 48 hr old bacterial cultures, whereas uninoculated seeds were treated with sterile nutrient broth. Fifteen rhizobacteria treated seeds were placed on germination paper under aseptic conditions and incubated at 37°C in a BOD incubator in the dark for 24–48 hours. The effect of seed treatment with rhizobacteria on seed germination (%), fresh and dry weight of seedlings and radicle and plumule length were studied. The findings indicated that the seed inoculation with bacterial isolates improved seed germination and seedling growth as compared to un-inoculated control (Fig. 7 and Fig. 8 A, B, C, D, E and F).

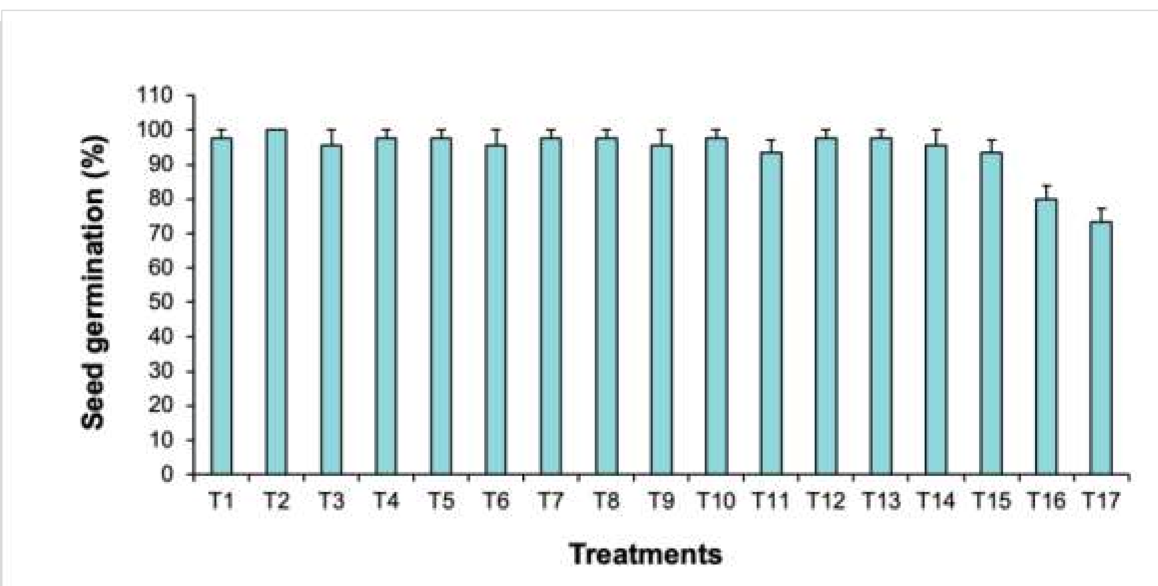


Fig. 7. Effect of seed treatment with rhizobacteria on jute seed germination percentage. T1 – T5: JRPS isolates; T6 – T10: JRKS isolates; T11 – T15: JRNF isolates; T16: Control (nutrient broth); T17: Control (distilled water).

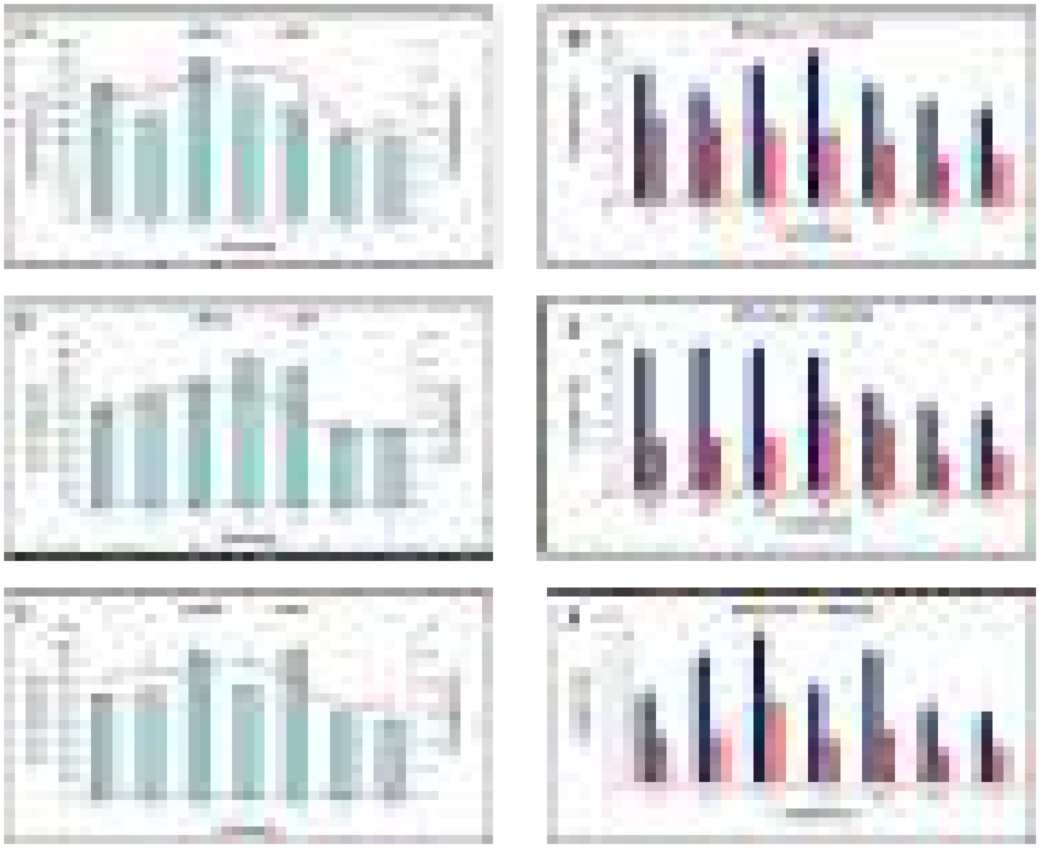


Fig. 8. Effect of seed treatment with rhizobacteria on jute seedling fresh weight, dry weight, plumule and radicle length. (A and D) T1 – T5: JRPS isolates; (B and E) T1 – T5: JRKS isolates; (C and F) T1 – T5: Nitrogen fixing bacterial isolates; T6: Control (nutrient broth) and T7: Control (distilled water) in fig. A, B, C, D, E and F.

1.3 Integrated microbial and organic compost technologies for regenerative carbon-smart farming

A. K. Singh, S. Mitra, B. Majumdar, S.K. Sarkar, S. Satpathy, M.L. Roy and G. Kar

Project Code: In-house Project – JA8.1

A microbial consortium primarily composed of *Bacillus* strains, which significantly accelerates the composting of leaf litter (Fig 9) was used for compost making. The process time is reduced by nearly 50%, achieving thorough decomposition in as short as 50 days. The consortium enhances cellulose degradation by 45%, resulting in a finished compost that is rich in nutrients containing up to 24% organic carbon, 3.28% nitrogen, 1.5-2% potassium and phosphorus, and essential micronutrients. Such improvements not only expedite the recycling of crop residues but also produce superior compost that supports soil fertility and plant health. Strategic pairing of sunnhemp green manure with Rhizobium inoculation increases the green manure biomass by approximately 44% during the critical window of 30–50 days after emergence. The enhanced biomass translates into effective biological nitrogen fixation, providing an amount equivalent to 40–50% of the subsequent crop's nitrogen needs. Thus, green manuring fosters both soil organic matter enrichment and sustainable nutrient supply while reducing dependency on synthetic fertilizers.

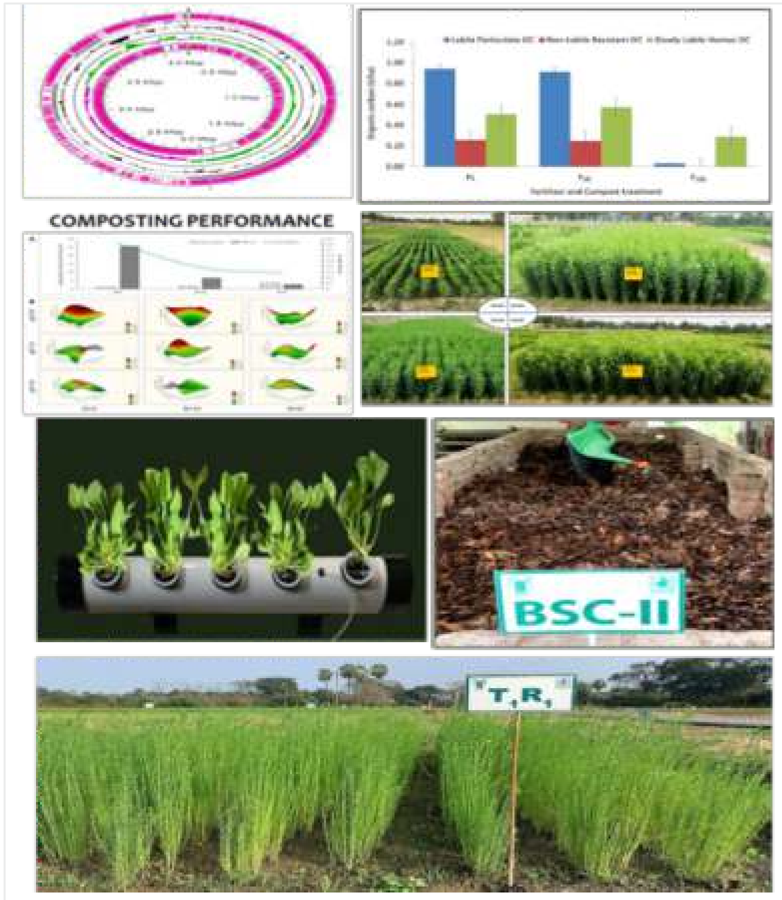


Fig. 9. Integrated organic compost technologies for regenerative carbon-smart farming in jute-flax cropping system

Applications of leaf litter compost replaces up to 50% of conventional synthetic fertilizers without compromising crop yields. This substitution protocol leads to an increase in soil organic carbon by 20–24%, strengthening soil structure and fertility. Simultaneously, compost application demonstrates a significant reduction in nitrous oxide emissions associated with fertilizer use making it a vital tool for climate mitigation in agriculture. Carbon Mitigation Tech integrating EM-based (Effective Microorganisms) composting methods with sunnhemp cover cropping enables the sequestration of up to 0.5 tonnes of carbon per hectare per year and reduces overall field emissions by 310 kg CO_2-eq per hectare. The dual action of increased carbon capture and lowered emissions enhances both soil and atmospheric health across production landscapes. An innovative liquid bio-nutrient, derived from leaf litter compost formulated for hydroponic crop systems, which helped to increase the leafy vegetables productivity by 20–35% compared to the commercial synthetic nutrient solutions. Beyond yield gains, the use of compost-based nutrients supports a closed-loop waste-to-resource system and improves nutrient uptake efficiency in hydroponic applications. Collectively, these microbial and organic advances underpin scalable models for regenerative, carbon-smart farming and provide farmers with robust pathways to restore soil health, support crop productivity, and address climate change.

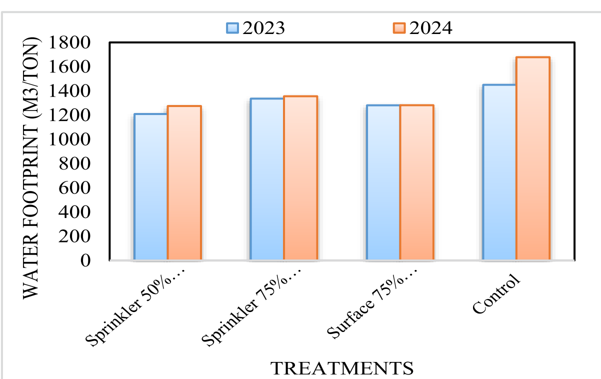
1.4 Precision irrigation scheduling for augmenting yield, resource-use efficiency and water productivity in Jute based cropping systems

Sourav Ghosh, G. Kar, S.Mitra, A.K. Singh, T. Samajdar, R.K. Naik* and *D. Barman

Project Code: In-house Project JA 8.8

Sprinkler irrigation at 50% DASM consistently remained the most efficient regime (Fig 12), recording 37–41% higher jute yield over the control and about 10% higher water productivity compared to surface irrigation at 75% DASM. Data analysis revealed that sprinkler irrigation at 50% DASM reduced the crop water footprint by 18–21% in jute (pooled ~1250 m^3/t) and by about 11% in flax (pooled ~1318 m^3/t). The lowest total water footprint (~1800 m^3/t), representing nearly a 19% reduction, was also achieved under the 50% DASM sprinkler regime. These results reaffirm the advantage of optimized sprinkler scheduling in achieving superior water savings while sustaining fibre yield in the jute–flax system (Fig 10).

Carbon budgeting conducted using life cycle assessment highlighted the strong environmental gains associated with advanced irrigation strategies. Carbon footprint analysis showed an 11% reduction in yield-scaled carbon footprint under sprinkler irrigation at 50% DASM. Carbon sustainability index improved by ~16.5%, demonstrating improved carbon efficiency due to lower emissions per unit fibre and better system performance. Overall, the findings provide strong evidence that integrating sprinkler irrigation with scientifically calibrated DASM-based scheduling substantially enhances water, energy, and carbon efficiencies in the jute-based cropping system (Fig 11).



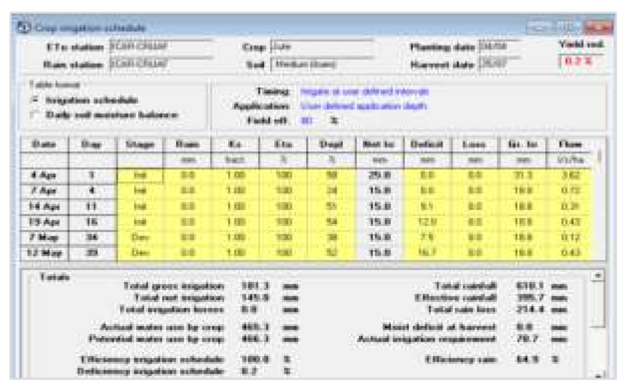
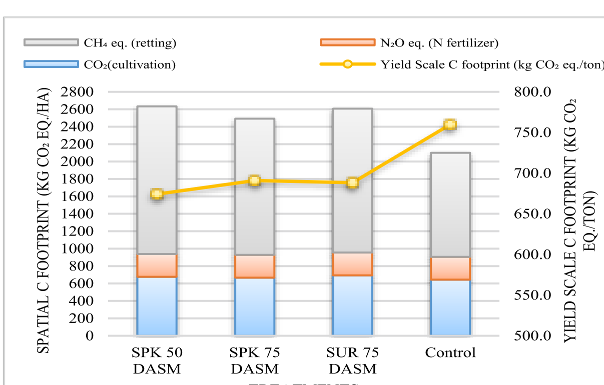


Fig. 10. Water footprint of Jute (pooled) under different irrigation schedules (a) and CROPWAT-generated irrigation schedule for computing actual evapotranspiration and soil moisture balance (b)



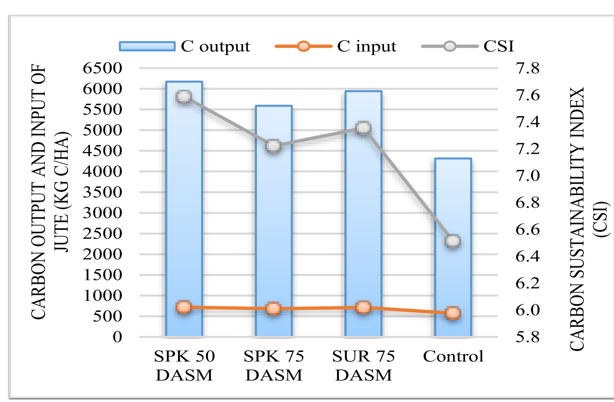


Fig. 11. Carbon footprint, carbon input–output, and carbon sustainability index (CSI) of jute under different irrigation schedules

Fig. 12. Sprinkler irrigated jute-Rice cropping system.

1.4 Water management strategies for profitable and sustainable jute cultivation under rainfed and irrigated ecosystems

Debarati Datta, G. Kar, A. K. Singh, D. Barman, N. M. Alam and R. K. Naik

Project Code: In-house Project JA 8.5

The study evaluated waterlogging-induced stress responses in jute (*Corchorus* spp.) to compare the tolerance of *C. olitorius* and *C. capsularis* under waterlogging imposed at 30, 45, and 60 DAS. Early-stage waterlogging (30 DAS) caused the greatest damage, reducing SPAD value (chlorophyll) by ~19%, LAI by ~26%, and fibre yield by 47-52%. Mid-stage stress (45 DAS) resulted in moderate losses (25-27%), while late-stage stress (60 DAS) caused minimal reductions (9-11%), indicating better recovery at advanced growth stages. Biochemically, both species enhanced catalase activity by 24-35%, reflecting strong antioxidative defence. Adventitious root dry weight and volume were higher in JRCJ 11 compared to JRO 204. JRCJ 11 exhibited nearly double the root volume, highlighting its stronger root development potential under waterlogged conditions (Fig 13). Waterlogging also degraded fibre quality: 15-day stress at 30 DAS reduced fibre strength by ~29% in JRO 204 and ~18% in JRCJ 11, and increased coarseness by 21–27% (Fig 14). Quality deterioration was linked to disrupted vascular differentiation, poor lignification, and inadequate cellulose deposition under anaerobic conditions. Overall, early waterlogging caused 15–30% loss in strength, reduced lustre and colour, and significantly lowered market grade. Variety JRCJ 11 (*C. capsularis*) outperformed JRO 204 (*C. olitorius*), showing higher physiological resilience and superior fibre quality under waterlogged condition (Fig 15).

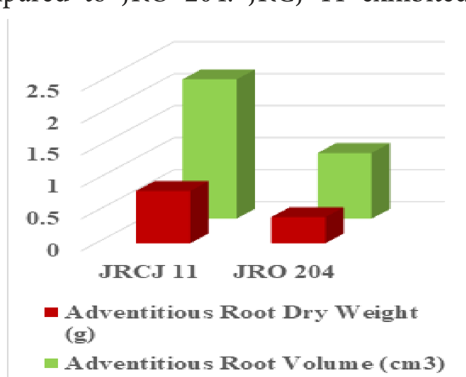


Fig. 13. Adventitious root dry weight and root dry volume under waterlogging stress in JRCJ 11 and JRO 204. Root structural modifications a. Waterlogged condition b. Non waterlogged condition

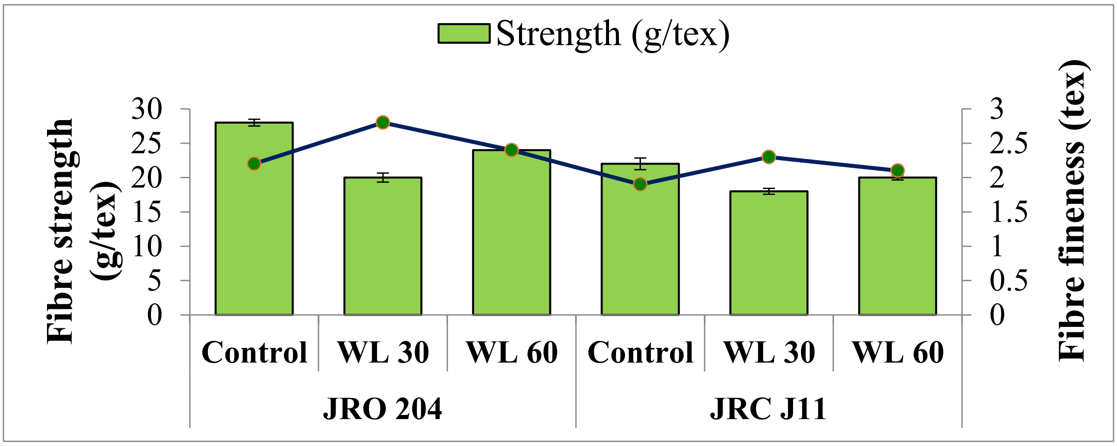


Fig. 14. Fibre strength and fibre fineness under different waterlogging treatments

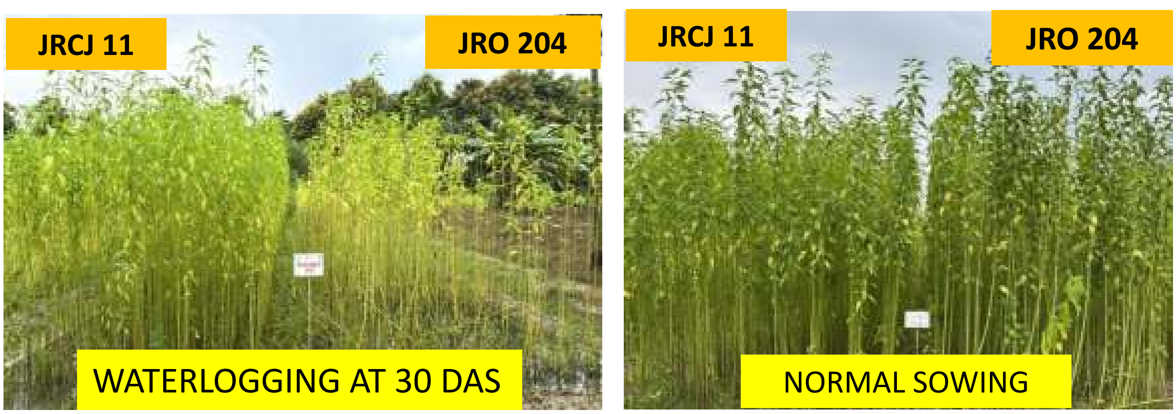


Fig. 15. Jute crop at Harvest under two conditions a. Waterlogging imposed at 30 DAS for 15 days b. Normal sowing condition

1.6 Effect of jute phenological stage on waterlogging tolerance and quality of leaf based by products

P. R. Dvite, G. Kar, S. Saha, S. P. Mazumdar and K. N. Chourasia

Project Code: In-house Project Code: JA 8.9

A study was conducted to investigate the antioxidant responses of two tossa jute varieties (JRO 204 and JRO BA3) and two white jute varieties (JRC J11 and JRC 212) under waterlogging stress. Forty five (45) days old pot-grown plants were exposed to waterlogging stress by maintaining a 15 cm water level for 5, 10, and 15 days of waterlogging (DWL). Results showed that superoxide radicals increased by 32.3-115.3% across all durations of waterlogging (Figure. 16A). This accumulation was considerably higher in tossa jute (76-115.3%) compared to white jute (32.3-43%). Furthermore, the activities of key antioxidant enzymes such as superoxide dismutase (SOD), catalase, and peroxidases rose by 4.9-71.2%, 2.8-48.3%, and 1.3-103.9%, respectively, under all waterlogging treatments relative to the controls (Fig 16 B). Notably, these enzyme activities were consistently higher in white jute varieties. On the other hand, the elevated SOD activity in white jute was associated with lower superoxide radical accumulation, whereas reduced SOD activity in tossa jute corresponded with greater superoxide build-up under stress (Figure. 16 A & C). Overall, the findings suggest that the stronger antioxidant enzyme response in white jute helps limit ROS accumulation, contributing to better tolerance to waterlogging stress.

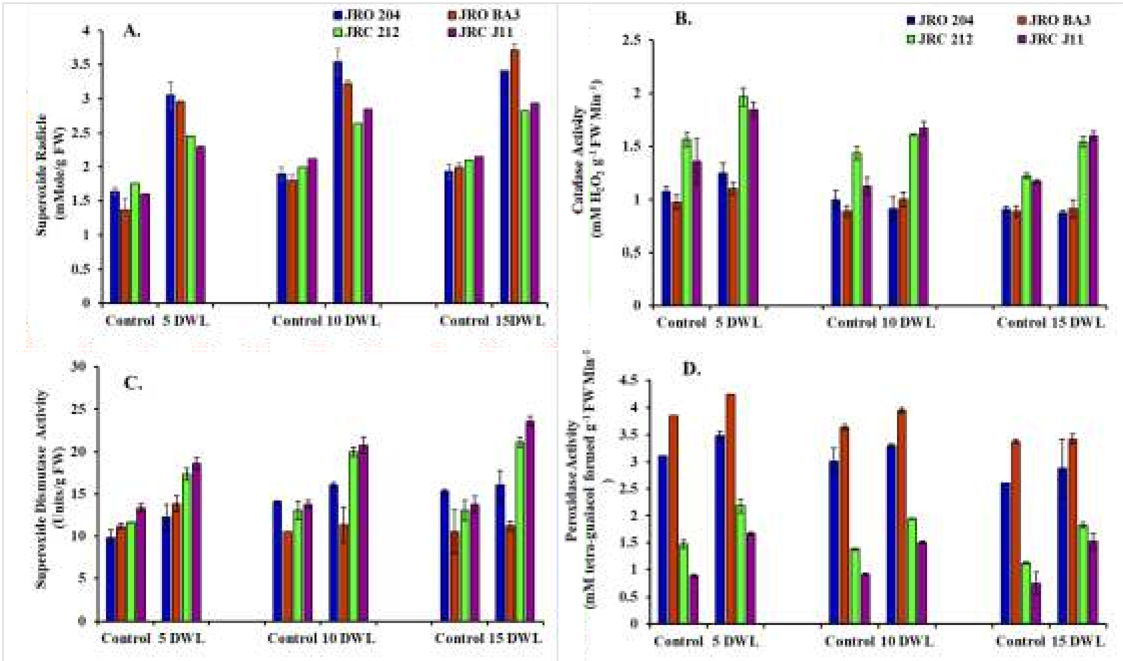


Fig.16. A. Superoxide radicle levels and activities of B. Catalase, C. Superoxide Dismutase (SOD), D. Peroxidase in four jute genotypes subjected to 5, 10, and 15 days of waterlogging (DWL) stress.

1.Climate Change and Resilient agriculture

2.1 Assessment of climate-soil-water-related ecosystem services on jute productivity

A. K. Singh, B. Majumdar, S. K. Jha and G. Kar

Project Code: External Funded Project - Jute-ICARE

The assessment of climate-soil-water-related ecosystem services on jute productivity under the Jute-ICARE Project highlights transformative impacts and addresses crucial environmental challenges in jute cultivation regions (Fig 17). Imbalanced fertilizer use remains a major threat to long-term soil fertility. Traditional farmer practices often result in excessive or poorly timed fertilizer applications, which degrade soil structure, reduce organic carbon stocks, and diminish overall land productivity over time. These practices can also cause nutrient runoff and increase greenhouse gas emissions, undermining both environmental health and crop yield potential in marginal agro-ecosystems. Adoption of the Improved Practice (IP) protocol developed by ICAR-CRIJAF has provided notable environmental and economic benefits. Compared to standard farmer practices, IP reduced carbon footprints by 25%, demonstrating significant mitigation of on-farm greenhouse gas emissions. Moreover, IP improved soil health, delivering an 11.5% increase in soil carbon stock. This is linked to better nutrient utilization, reduced chemical fertilizer dependence, and a more resilient soil ecosystem. Enhanced soil carbon not only boosts crop yields but also fortifies soil against erosive forces and climate-induced stresses.

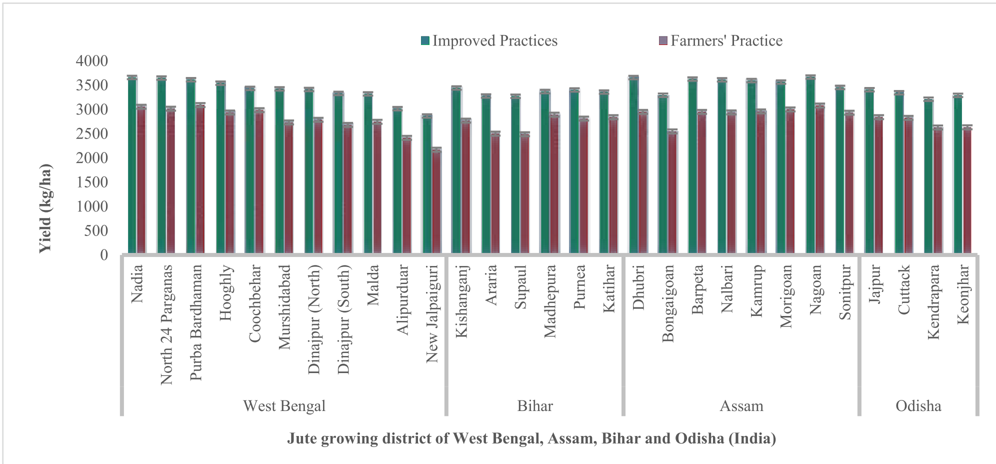


Fig. 17. Changes in jute fibre yield under Farmers' practice and improved practices of ICAR-CRIJAF in Jute growing states of India

The environmental advantages of IP are further evidenced by an increase in the carbon sustainability index (CSI) from 1.41 under farmer practice to 2.14 under IP. Annual carbon sequestration rates reached up to 533 kg CO_2eq per hectare, contributing significantly to local and global carbon budgets. These achievements underpin the economic viability of IP for smallholder farmers, with carbon credit potential reaching as high as 1.58 t CO_2 per hectare valued at approximately US$80 per hectare under current market conditions. Such credits offer new income streams and incentives for climate-smart farming. Jute cultivated using the IP framework emerges as a model climate-smart crop. Its cultivation restores soil fertility, supports rural livelihoods through increased income and job creation, and integrates carbon mitigation and market access opportunities. The sustainable intensification promoted by IP ensures these benefits are realized without degrading local ecosystems, making jute farming more resilient and adaptable to climate variability. In summary, the adoption of improved agronomic and ecological practices not only enhances crop productivity and farmer income but also delivers measurable soil, water, and climate benefits in vulnerable regions providing a replicable pathway towards sustainable intensification in Indian jute agriculture.

2.2. In-season smart sensor enabled advanced technological interventions for real time water management of jute based cropping system under changing climate scenario

A. K. Singh, S. K. Shome, D. Datta and G. Kar

Project Code: External Funded Project – DST-SEED

The DST-SEED research project, initiated in 2023-24 in collaboration with CSIR-CMERI, focuses on innovative technological solutions for real-time water management in jute cultivation under evolving climate challenges. This initiative is designed to enhance adaptation capacity at the farmer's field level through advanced sensor hardware and integrated IoT frameworks. At the core of the project is the development of smart multi-sensor hardware. This sophisticated, low-power prototype incorporates sensors for soil moisture, temperature, humidity, and ambient light, enabling precise monitoring of critical agro-climatic variables. The hardware is specifically designed and fabricated for field deployment, with rigorous testing underway to ensure accuracy, reliability, and suitability for diverse farm environments. A key innovation is the IoT-Based real-time irrigation framework (Fig 18). The system leverages an ESP32-based microcontroller platform, supporting wireless connectivity and seamless integration with cloud data services. This architecture enables live data capture, visualization, and analytics, giving farmers and agronomists access to actionable information for irrigation scheduling. The cloud platform processes incoming sensor data and automates irrigation decision-making, which helps reduce water use, optimize application timing, and adapt rapidly to fluctuations in weather and crop water demand.

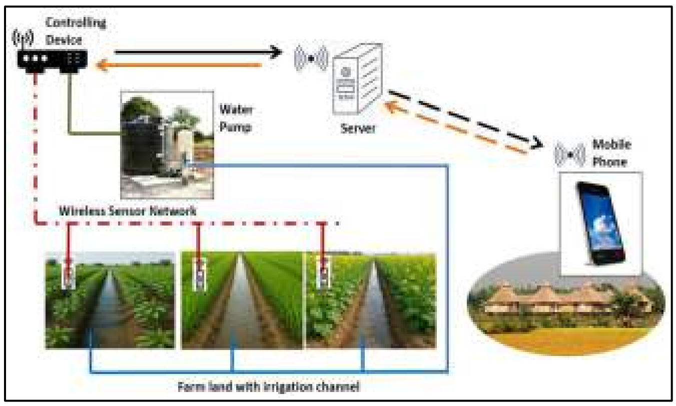


Fig. 18. Smart crop irrigation system using IoT

Field trials on jute and mustard crops confirm that these technological interventions empower farmers to transition towards climate-resilient jute production. The combined use of sensor-enabled hardware and IoT-driven management systems results in significant improvements in water use efficiency, crop health, and productivity, while reducing manual intervention and uncertainty due to changing environmental conditions. In summary, the DST-SEED project demonstrates how cross-disciplinary research and advanced technology can meaningfully address water management and adaptation needs in jute agriculture offering scalable solutions for sustainable intensification under climate variability.

2.3 Prediction of soil temperature from air temperature under jute-rice-wheat cropping system in the Indo-Gangetic plain

D. Barman, A. Chakraborty, B. Majumdar and G. Kar

Project Code: External Funded Project – ISRO National Carbon Project

The availability of soil temperature data especially of cultivated soils is very limited worldwide. Therefore, models were developed to predict soil temperatures under jute, rice and wheat crops from air temperatures data for understanding the soil bio-geochemical processes. Soil temperature at 5 cm depth and air temperature at 2.5 m above the ground were recorded at half-hourly interval in 2018 to 2024 by an eddy flux tower from jute-rice-wheat cropping sequence in the Indo-Gangetic plain. The soil and air temperature were classified according to the phenological stages of each crops. For jute, the five growth stages were germination (1-6 DAS, days after sowing), seedling (7-36 DAS), active vegetative (37-66 DAS), fiber development (67-96 DAS), and maturity (97-111 DAS); for rice the six phenological stages were vegetative (1-16 DAS), tillering to panicle initiation (17-36 DAS), reproductive stage (37-49 DAS), flowering (50-68 DAS), ripening (70-80 DAS), and maturity (81-95 DAS); and for wheat the nine different phenological stages were seedling (1-21 DAS), tillering (22-35 DAS), stem elongation (36-45 DAS), booting (46-60 DAS) heading (61-75 DAS), flowering (76-90 DAS), milking (91-97 DAS), dough (98-104 DAS) and ripening (105-118 DAS) stages.

Notably, soil temperatures were higher than the respective air temperatures during the night time in all cropping seasons for both 2018 and 2024. However, in daytime its' reverse trend was found. Regression models were developed to predict soil temperatures at 5 cm depth from air temperatures for all the three crops (jute, rice and wheat) and their respective phenological stages both for daytime and night time. Regardless of the crops, it was observed that the exponential regression models were best fitted models for predicting soil temperatures at 5 cm depth at the half-hourly interval from the respective air temperatures data during the daytime (7:00 am to 6:00 pm), while linear regression models were best fitted models for night time soil temperature prediction (6:30 pm to next day 6:30 am) (Fig 19). Analysis of both the years' data revealed that the coefficient of determination (R^2) values during daytime varied from 0.44 to 0.74 in jute, 0.59 to 0.62 in rice and 0.48 to 0.77 in wheat. However, the R^2 values in night time ranged from 0.79 to 0.97 for jute, 0.91 to 0.98 for rice and 0.48 to 0.99 for wheat, respectively. The best-fitted models for different crop physiological stages may be used for various locations under similar cropping sequence after finer adjustment by local calibration and validation. These models will be helpful for studies on nutrient mineralization, greenhouse gas emission from soils, land surface temperature modelling and other spatial modelling using remote sensing and GIS technologies.

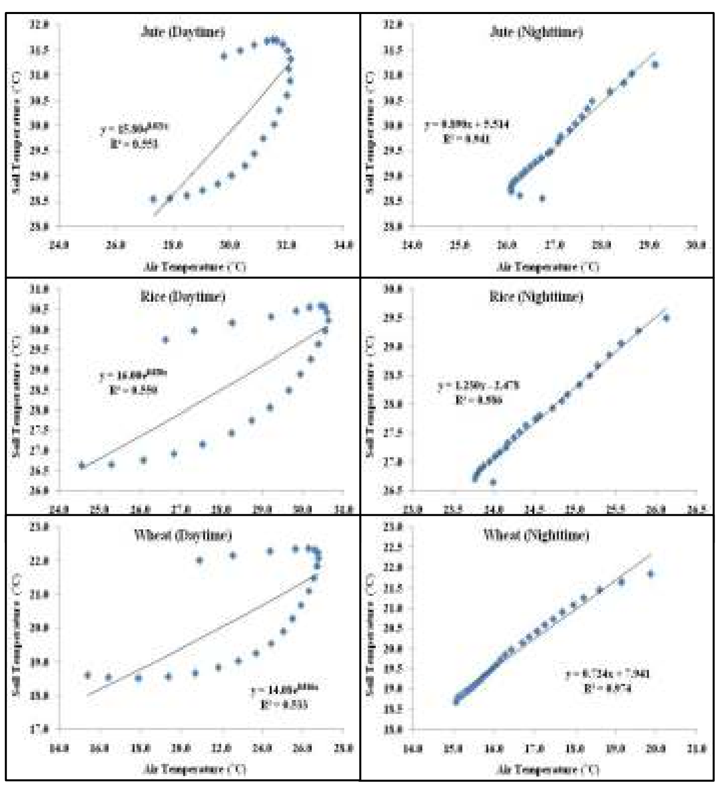


Fig. 19. Soil temperature prediction models at 5 cm depth of soils under jute, rice and wheat crops

3 Crop Management

3.1 Standardization of organic & natural agriculture practices for jute based agro-ecosystem

S.P. Mazumdar, G. Kar, S. Satpathy, S. Ghosh, B. Majumdar, S.K. Jha, R. Saha and S. Saha

Project Code: In house project- JA 8.6

The present research was carried out at ICAR-CRIJAF Research Farm to study the effects of low-cost natural farming, organic farming, conventional and integrated agricultural practices on system productivity (Fig 20). The experimental data revealed that integrated nutrient management being at par with inorganic nutrient management recorded significantly higher mean system yield as compared to organic and natural farming. Among the cropping systems, Jute+ Mungbean - Rice – Flax + methi resulted in significantly higher mean system yield, followed by jute-rice-lentil and jute-rice-mustard.

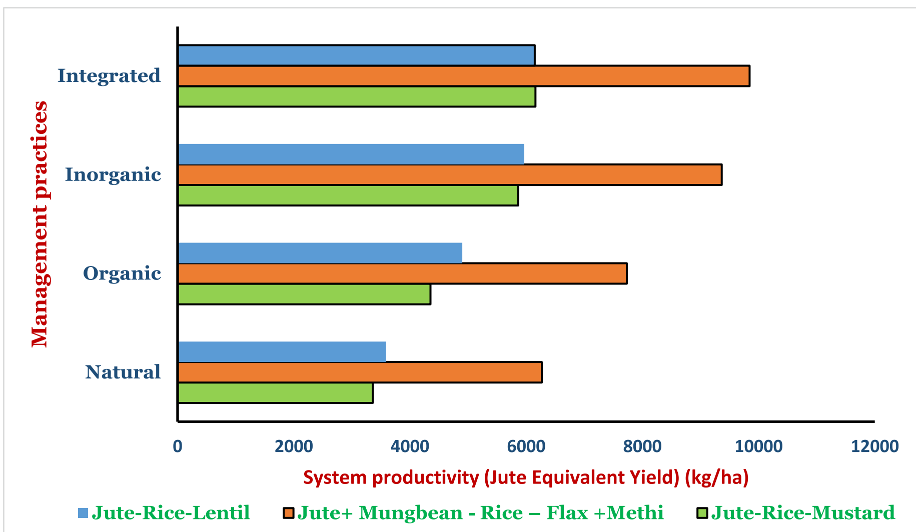


Fig. 20. Effect of natural, organic, conventional and integrated agricultural practices on system productivity

Research was also conducted to identify the best jute based cropping system that would help in enhancing soil health to sustain agricultural production. The result of the present study revealed that jute based cropping systems have significant effect on soil quality index at both the surface and sub-surface soils. Among the systems, the SQI ranged from 0.15 to 0.96 in 0-15 cm and 0.27 to 0.80 in 15-30 cm. For the surface soil, SQI was in the order of rice-lentil-jute (OM) (0.96), rice-mustard-jute (OM) (0.72), rice-potato-jute (OM) (0.59), rice-lentil-jute (CM) (0.5), rice-mustard-jute (CM) (0.31), rice-potato-jute (CM) (0.15) and at 15-30 cm rice-lentil-jute (OM) (0.80), rice-mustard-jute (OM) (0.69), rice-potato-jute (OM) (0.59), rice-lentil-jute (CM) (0.58), rice-mustard-jute (CM) (0.39), rice-potato-jute (CM) (0.27). Soil quality index was good in organically managed cropping systems as compared to conventional systems. The present findings suggest that adopting organically managed jute- rice-lentil system is pivotal for maintaining soil health and promoting agricultural sustainability in jute based cropping systems and is highly recommended for Eastern Indo-Gangetic plains

3.2 Expansion of flax area in pilot scale with improved technologies

S. Mitra, J. Mitra, C. S. Kar, S. Sarkar, S. K. Jha, S. K. Pandey, R. K. Naik, K. Das and S. P. Mazumdar

Project Code: In house project- JA. 8.4

The project was conducted for identification of suitable areas for flax cultivation in country and to conduct demonstrations on improved flax cultivation and also to fine tune the improved production technologies for fibre flax production. Initiatives were taken to create linkage between farmers and industry and research. The project also aimed at developing location specific production technologies for achieving higher fibre yield of flax in the country. Field experiments were conducted at ICAR-CRIJAF, Barrackpore to develop integrated nutrient management schedule for achieving higher fibre yield of flax and also to determine ideal harvesting and retting durations to obtain superior quality fibre of flax under south Bengal conditions.

The INM trial was conducted with 07 treatments comprising - T_1: control; T_2: 50% NPK; T_3: 50% NPK + FYM @ 5 t/ha; T_4: 50% NPK + FYM @ 10 t/ha; T_5: 50% NPK + FYM @ 5 t/ha + *Azotobacter*; T_6: 50% NPK + FYM @ 10 t/ha + *Azotobacter* and T_7: 100% NPK, respectively, and the treatments were replicated thrice. The experimental results revealed that all the fertilizer treatments recorded significantly higher plant height, basal diameter and fibre yield over the control treatment. The INM treatments T_4, T_5 and T_6 recorded raw (unclean) fibre yield of flax which were statistically at par with that of T_7 treatment (100% NPK) while maximum raw fibre yield was recorded with T_6 treatment (22.45 q/ha). The treatments T_6 and T_7 were also statistically at par with respect to plant height of flax. No significant variation in basal diameter of flax plants was observed among the fertilizer treatments (Fig 21)

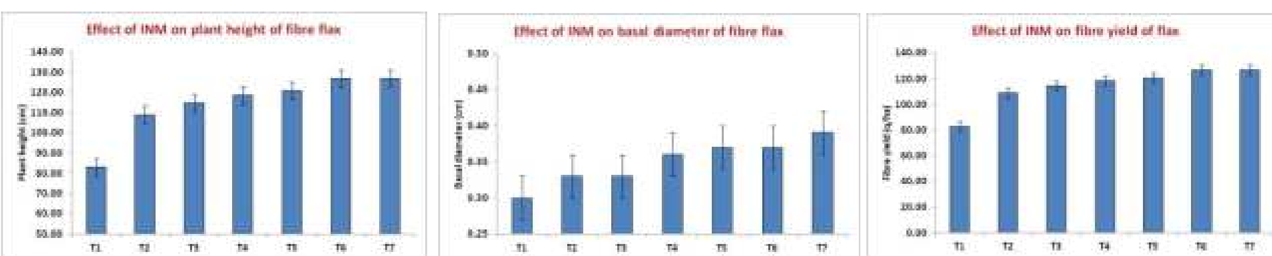


Fig.21. Effect of INM on plant height, basal diameter and fibre yield of flax at Barrackpore

A trial conducted in 2024-25 on determining the ideal harvest and retting duration for fibre flax, three time of harvests (H_1: 100 days, H_2: 110 days and H_3:120 days) and four retting durations (R_1: dew retting, R_2: 18 hr water retting, R_3: 24 hr water retting and R_4: 48 hr water retting) were tested in a factorial RBD design with four replications. The experimental data revealed that the green weight and dry stick weight of flax increased significantly from 100 days to 120 days duration with the maximum values of both the parameters recorded with harvesting at 120 days (168.92 & 67.89 q/ha, respectively) while the effect of retting duration was non-significant on both the parameters at Barrackpore (Fig. 22). The effect of harvest time and retting durations were significant on both raw scutched fibre and line (clean) fibre of flax. Maximum raw fibre yield was recorded with 120 days crop (21.59 q/ha) followed by 110 days crop (20.76 q/ha) and the difference between two treatments was statistically non-significant. In case of line fibre, maximum flax fibre was recorded at lowest harvest duration 100 days (4.25 q/ha) and it decreased with crop age up to 120 days. Significantly higher raw fibre yield were recorded with dew retting (23.72 q/ha) followed by 24 hour water retting. In case of line fibre also, dew retting recorded highest fibre yield (4.66 q/ha) followed by water retting treatments (Fig. 23). The bundle strength and fineness of line fibre of flax were significantly influenced by both harvest duration and retting methods. The bundle strength value increased with crop age up to 110 days (25.06 g/tex) and decreased slightly at 120 days (harvest duration) (24.94 g/tex) but the fibre was finer at 100 days age (1.51 tex) and became progressively coarser with increased harvest duration. Higher bundle strength were recorded with dew retting or with under water retting for 18 to 24 hours and it decreased significantly with 48 hours retting (21.37 g/tex). The dew retting produced coarser fibre while finest fibre was recorded with 48 hours under water retting in flax (Fig. 24).

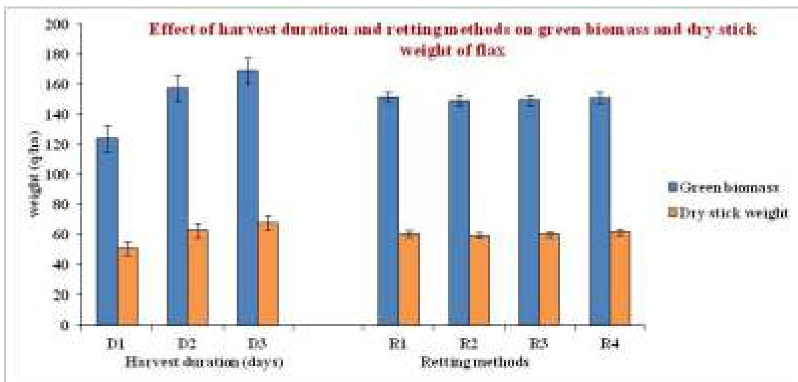


Fig. 22. Effect of harvest duration and retting methods on green biomass and dry stick weight of fibre flax

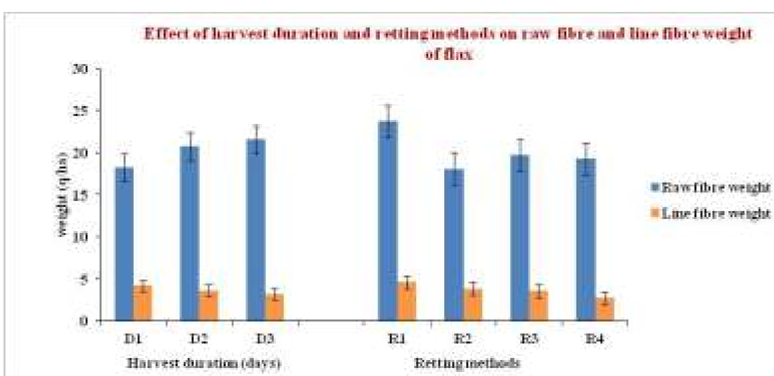


Fig. 23. Effect of harvest duration and retting methods on raw fibre weight and line fibre weight of flax

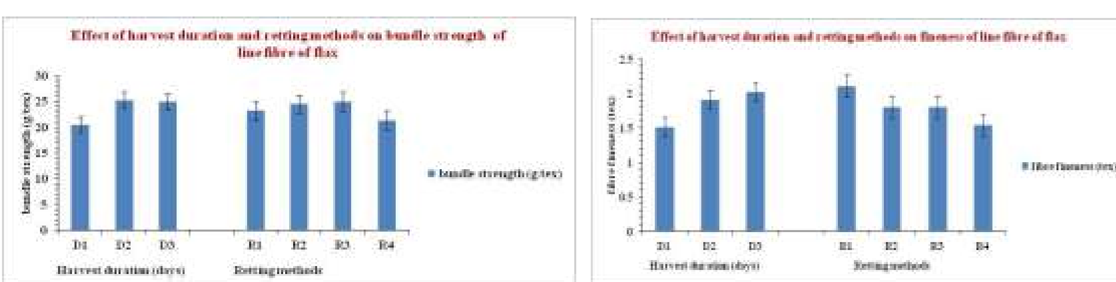


Fig. 24. Effect of harvest duration and retting methods on bundle strength and fineness of line fibre of flax

To create an effective linkage between farmers and industry and research, a MoU was signed on 02.01.2025 between ICAR-CRIJAF, M/s OG Hemps, Kolkata & M/s Grasim Industries Ltd. – Jayshree Textiles in presence of Sh. Giriraj Singh, Hon'ble Textile Minister, GOI and Jute Commissioner, Govt. of India for initiation of pilot scale flax cultivation in the country (Fig 25).

Fig 25. Signining of MoU between ICAR-CRIJAF and M/s OG Hemps, Kolkata & M/s Grasim Industries Ltd. – Jayshree Textiles in presence of Sh. Giriraj Singh, Hon'ble Textile Minister, GOI

3.3 Demonstration trial on Effect of spatial uniformity on productivity

A. K. Chakraborty, D. Datta and N.M. Alam

Exploratory Trial

Jute (*cv.* JROBA 3) was sown on 1st April 2025. Seven spatial patterns tested in an RBD in 3 replications. N:P:K fertilizers applied at the rate of 60:30: 0. Applied 3ml/l of Pretilachlor 50 EC at 40 hours after irrigation (2nd April) for composite weed control. At 7 DAS run CRIJAF Nail weeder in between lines of line sown patterns for controlling germinating weeds at an early stage followed by manual thinning at 20 DAS. In broadcast patterns applied Improved CRIJAF Nail Weeder at 7 DAS for weeding-thinning of plots and followed by light weeding-thinning manually at 20 DAS. Plants harvested at 120 DAS.

Table 1. Effect of plant geometry on fibre trial of jute

Treatments	Plant biometry at 120 DAS		Green Biomass (tonnes/ha)	Fibre Yield (q/ha)
	Height (cm)	Base Diameter		
T1 = 25 cm × 8 cm	311.2±37.1	16.1±2.5	38.3	30.4^{ab}
T2 = 20 cm × 10 cm	307.8±22.9	16.8±2.9	44.0	35.0^{a}
T3 = 18 cm × 10 cm	236.8±60.6	10.9±3.8	34.9	25.3^{b}
T4 = 15 cm × 15 cm	292.8±29.4	16.0±2.7	40.1	29.8^{ab}
T5 = 15 cm × 12 cm	299.6±35.2	14.6±3.2	39.1	28.6^{ab}
T6 = Broadcast with 30-40 plants/m^2	281.1±31.9	12.8±1.8	43.7	34.3^{ab}
T7 = Broadcast with 60-70 plants/m^2	307.4±27.7	14.2±2.5	37.2	27.2^{ab}
	CV (%)		12.82	10.89
	Tukyes HSD		NS	5.83

Spatial neighbourhood distances measured form photo images (Fig.26) of 3m × 3m plots receiving T6 and T7 treatments analysed for. Images contained sufficient plant counts (>300 in case of T6 and >500 of T7) for valid estimation and inferences. Thiessen polygons (Fig.27) are nearly uniform with nearest neighbor at approximately 14.5 cm away on an average for T6 and at nearly 10 cm distant for T7. In both the instances cv % remained low. These results simulate spatial uniformity of plants as in square grid planting of 12 cm × 12 cm and 16 cm × 16 cm, respectively. Yield of 20 cm × 10 cm rectangular spacing (T2) is nearly equal to broadcast sowing with 30-40 plants/m^2 (T6).

Plant Density 30-40 plants/m^2

Plant Density 65-75 plants/m^2

Fig. 26. Photo images of 3m × 3m area

Plant Density: 30-40 plants/m^2

Plant Density: ≥ 60 plants/m2

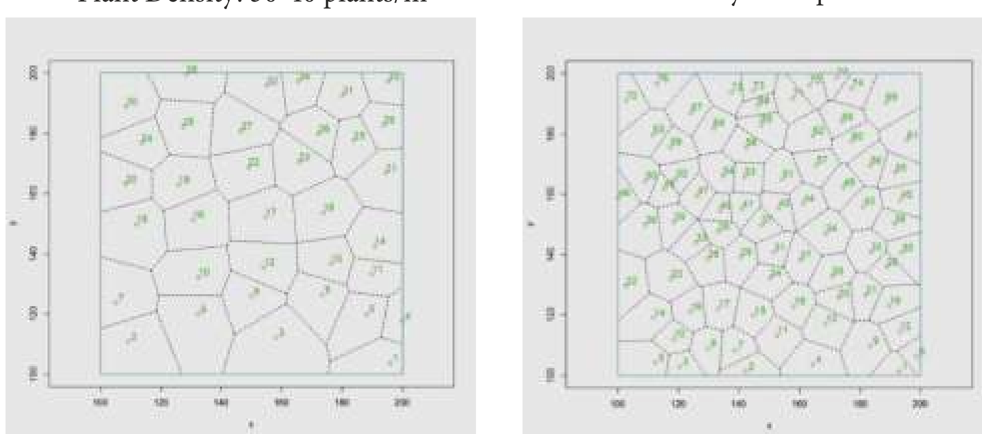


Fig. 27. Thiessen polygons

Jute-black gram intercropping trial Jute (JROBA 3) and black gram (VBN 10) broadcast sown as intercrop on March 7, 2025 in a 5m × 6m plot. Harvested pods at 70 DAS and jute plants at 120 DAS. Fibre yield was 30.2 q/ha and seed yield was 1.85 q/ha in intercropping, whereas sole black gram yield was 7.2. VBN 10 had more vigorous growth compared to PU-31

3.4 Analysis of Yield Gap and Contribution of Production Factors in Cultivation of Jute

S. K. Jha, M. L. Roy, S. Mitra, R. Saha, S. P. Mazumdar, R. K. Naik and A. K. Chakraborty

Project Code: In-house Project -JEXA 6.1

The study area involved the area of operation under Jute-ICARE program viz. West Bengal, Assam, Bihar, Odisha& Meghalaya. The overall Technology Gap as well as Extension Gap observed in West Bengal , Assam, Bihar, Odisha and Meghalaya are presented herewith (Fig 28). In West Bengal, extension gap was found maximum at Murshidabad (7.67 q/ha) and Uttar Dinajpur (7.41 q/ha) while the technology gap was found maximum at Malda (5.80 q/ ha) and Dakhin Dinajpur (5.70 q/ ha) districts. Similarly, in case of Assam, technology gap was found maximum at South Salmara (6.01 q/ ha) and West Karbi Anglong (5.60 q/ha) while the extension gap was found maximum at Bongaigaon (7.45 q/ ha) followed by South Salmara (7.43 q/ha) district. For Bihar, technology gap was found maximum at Katihar (06.42 q/ ha) and Madhepura (06.32 q/ ha) while the extension gap was found maximum at Supaul (07.87 q/ha) and Araria (07.77 q/ha) district. In case of Odisha, technology gap was found maximum at Cuttack (06.56 q/ ha) district while, the extension gap was found maximum at Jaipur (07.15 q/ha) district . For Meghalaya state, data from Tura district was received which showed that extension gap was 07.11 q/ ha while technology gap was found to be 06.61 q/ ha.

The technology gap observed may be attributed to soil moisture availability, soil nutrient availability, competition between jute and weed for water and nutrient uptake etc. It has been observed that demonstration of the improved production technologies in the farmers' field have enhanced the jute productivity and have bridged the gap between farmers' practice yield and potential yield.

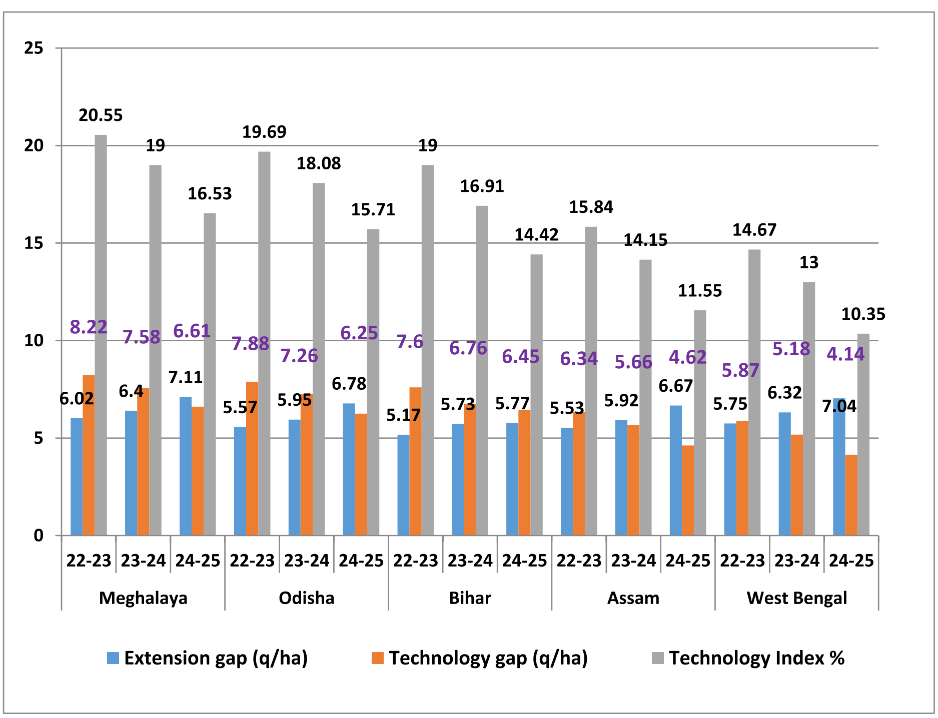


Fig. 28. Extension gap, technology gap and technology index in jute growing states of India

The range of yield gap bridging in West Bengal was observed to be 38 – 75 %; in Assam it was 43 – 67 %; Bihar (35 – 60 %); Odisha (38 – 55 %) and Meghalaya (42 - 52 %). This reveals that the gap between the farmers' practice yield and potential yield is being narrowed down by using the improved jute production technologies. A wide extension gap emphasizes the need to educate farmers for using improved production technologies, to reverse this trend. Hence, to narrow down the gap between the two types of yield, not only improved agro-technologies but location specific recommendation are very much necessary and greater use of the latest, improved production technologies can subsequently bridge this technological gap.

3.5 Minimizing yield gap and maximizing the income of jute-based farm families through cluster-based approach-a case study

M. L. Roy, S. K. Jha, Shailesh Kumar, Shamna A. and G. Kar

Project Code: In-house Project-JEXA 6.3

Frontline demonstrations on cultivation of improved high yielding jute variety (*cv* JRO 204), line sowing of jute by CRIJAF jute seeder followed by mechanical weed control by CRIJAF jute weeder and improved retting of jute by CRIJAF SONA powder were conducted on 50.47 ha, 25 ha and 35 ha area, respectively covering Chandigar, Tarangahati and Moraldanga villages of Gaighata block in North 24 Parganas. The results of these FLDs showed an increase in jute yield by around 5 q/ha and enhancement of fibre quality by 1-2 grades compared to farmers' practice besides reducing cost of cultivation. Farming system research and extension activities were followed to minimize yield gap and maximize the income of the jute growing farm families. The factors of yield gap and constraints in jute cultivation as perceived by the farmers were analyzed following the Garrett Ranking method. The factors of yield gap in jute cultivation as perceived by the farmers in descending order of rank were found as lack of scientific knowledge in jute cultivation, poor extension contact, lack of availability of quality input especially seed at local level, non-adoption of mechanization in jute cultivation, climatic aberrations and pest attack (Fig 29). The constraints in jute cultivation as perceived by the farmers in descending order of rank were labour scarcity and high cost of labour during peak season, high cost of inputs, lack of storage facility, lack of market information, poor transport facility and occasional low price of jute (Fig 30). The rural women who received skill development training on making of jute handicrafts started production and selling of these items under the aegis of Ichamoti FPC and some of the trainees have been acting as master trainer in the skill development trainings organized by the institute.

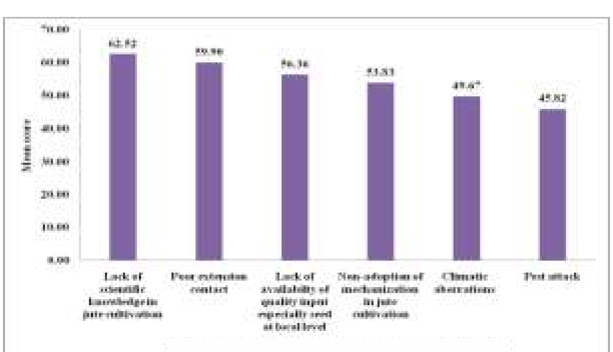


Fig. 29. Factors of yield gap perceived by farmers (N=94)

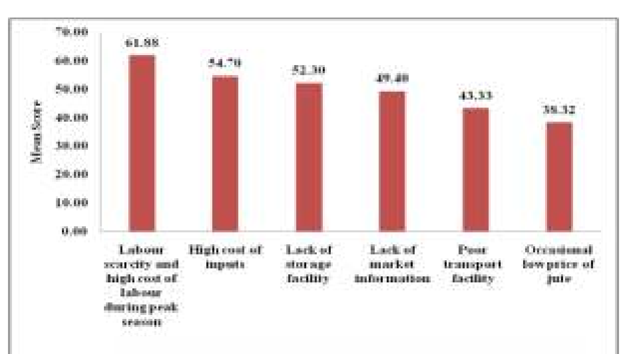


Fig. 30. Constraints in jute cultivation as perceived by farmers (N=94)

Fig. 30. Good crop stand of demonstration plot

Fig. 31. Trained women making jute handicrafts

3.6 Climate resilient jute farming for yield maximization, higher and sustainable farm income

K.G. Mandal, C.S. Kar, S. Ghosh, Shamna A, T. Adak, S. Satpathy, S. Saha and G.Kar

Exploratory trial

An exploratory trial has been conducted during the 2025 growing season of jute at the ICAR-CRIJAF Research Farm, with the objective to enhance the land productivity and income of jute growing farmers through intercropping of jute and maize. Jute and maize was intercropped in different row ratios. There were five treatments: jute and maize intercropping in 2:2, 4:2 and 2:4 row ratio, compared with sole jute and sole maize (Fig 32). The design of the field experiment was RBD, with four replications.

Sole crop of jute

Jute+ maize (2:2) intercropping

Fig. 32. Field view of jute + maize intercropping

The *Olitorius* jute variety was 'JROBA 3', and the maize variety was 'CMVL Babycorn 2', were grown. The crops were grown with fertilizer @ 80:40:40 kg N, P_2O_5 and K_2O per ha; N in two splits. The sowing was done on 30 April 2025. There was heavy shower immediately after sowing; provision of drainage of excess water could be made; even though the maize population could not be maintained optimum. The crop management was done as per the standard practices. The sole crop of baby corn and performance of intercropping was not satisfactory compared to the sole cropping of jute.

4. Post-harvest management and Value Addition

4.1 Jute-Improved Cultivation and Advanced Retting Exercise (Jute-ICARE)

B. Majumdar, S. Satpahty, S. Mitra, S. Sarkar, S. K. Sarkar, S. K. Jha, S. Datta, K. Mandal, A. K. Singh, R. K. Naik, Shamna A, M. L. Roy, S. Saha and G. Kar

Project code: External Funded Project-JUTE-ICARE

The Phase –XI of Jute-ICARE project was carried out in 280 Blocks under W.B., Bihar, Assam, Odisha, Meghalaya, Andhra Pradesh, Jharkhand, Chhattisgarh, Nagaland and Andhra Pradesh states covering 2,65,000 ha area involving 5.8 lakh farmers during 2025- 26 in collaboration with National Jute Board (NJB) and Jute Corporation of India (JCI). About 600 MT of certified seeds of jute (cv. JRO 204, JBO 2003H, CO-58, JBO-1, JROM-1, & JRC-532), 600 nos. each of CRIJAF seed drill and CRIJAF single wheel jute weeder were distributed among the farming community. During retting season, 325 MT of CRIJAF Sona were distributed among the farming communities for improved retting of jute and mesta. For the consecutive third year more than 700 nos. of crop cutting experiments (CCE) were conducted in West Bengal, Assam, Bihar and Odisha under the technical guidance and supervision of scientists of ICAR-CRIJAF in Jute-ICARE areas. Five In-house training on "Improved Production Technology for Quality jute Fibre Production" of 2 days each was conducted for 105 nos. of block supervisors and master trainers, from the states of West Bengal, Bihar, Assam, Odisha, Meghalaya, Jharkhand and Nagaland working under Jute-ICARE by ICAR-CRIJAF at ICAR-CRIJAF, Barrackpore during the year. Altogether 500 nos demonstrations of sowing, weeding and improved retting were conducted by the master trainers and block supervisors across the country under the technical supervision of scientists of ICAR-CRIJAF (Fig 33). The quality check of samples of CRIJAF SONA received from three licensed farm Bengal Biotech and Research, Panskura and Next to Nature, Guwahati and Creative Pharm, Barrackpore were carried out at ICAR-CRIJAF before the distribution of 325 MT CRIJAF SONA to the farming community. During the year, soil samples collected from the jute growing districts of Assam, Bihar, West Bengal and Odisha were analysed, soil maps were prepared and soil health cards are prepared for the farming community of these states.

Fig. 33. Improved Retting with CRIJAF SONA and production of quality golden fibre by farmers under Jute-ICARE

4.2 Development of a minimal water retting technology of jute

B. Majumdar, G. Kar, S. Datta and Debarati Datta

Project Code: External Funded Project-NASF Project

The polygalacturonase and pectin lyase activities as well as the pectinolytic cfu increased significantly in post-retting water compared to the pre-retting water of each retting method (Table 2). Higher polygalacturonase and pectin lyase activities in free flowing water retting, *in-situ* retting and stagnant water retting in concrete retting tank released by the presence of higher cfu of pectin degraders might have helped in quick biodegradation of pectin in jute over conventional retting where the pectin degrading enzymatic activities were very low, hence longer duration for pectin degradation in jute required. After the degradation of pectin, the xylan present in jute becomes accessible to the retting microbes having the property of secreting xylanase enzyme. Hence, the xylanolytic cfu in retting water increased to use xylan present in jute plants as carbon source and by their enzymatic action the xylan of jute is degraded, so the higher xylanase activity in post-retting water is recorded along with higher xylanolytic bacterial cfu. In the present study also, xylanase activity was significantly higher in retting methods where endospored based liquid "CRIJAF SONA" was used as the constituent bacteria of the microbial consortium possess higher xylanolytic activity without any cellulolytic activity; on the other hand, very less xylanolytic activity was recorded in conventional retting, thus extending the retting duration. After the degradation of pectin and hemicellulose/xylan present in jute plants, the lingo-cellulose network becomes accessible to the microbial community for degradation. Hence, in the post-retting water, higher celluloltic and ligninolytic cfu were recorded in all the retting methods. At this point, when lingo-cellulose fibre network is exposed after the biodegradation of pectin and xylan, the fibre is extracted to avoid the degradation of cellulosic fibre.

Table 2. Changes in pectin, xylan, cellulose and lignin degraders' population and their enzymatic activities in retting water during jute retting under different retting methods

Parameters	Free flowing water retting		*In-situ* retting		Stagnant water retting in concrete retting tank		Conventional retting		CD (P=0.05)
	Pre-retting	Post-retting	Pre-retting	Post-retting	Pre-retting	Post-retting	Pre-retting	Post-retting	
Pectinolytic cfu*	6.55	15.00	7.58	13.30	5.80	13.00	7.30	12.65	2.38
Xylanolytic cfu	5.68	13.20	6.00	11.55	4.65	11.30	5.75	9.50	1.72
Cellulolytic cfu	5.90	11.50	5.95	13.35	4.15	12.20	5.30	14.7	2.45
Ligninolytic cfu	6.80	10.52	6.20	10.30	4.62	10.00	3.60	7.90	2.52
Polygalacturonase (IU/ml)	3.20	4.90	2.45	4.62	2.55	4.50	1.22	2.20	0.40
Pectin lyase (U/ml)	33.8	142.5	25.8	139.50	23.0	135.5	10.6	43.8	6.8
Xylanase (IU/ml)	4.60	6.20	4.55	5.75	4.58	5.65	1.2	2.30	0.30

*Log value of colony forming unit

5. Mechanization and Energy Management

5.1 Development of CRIJAF Bast fibre decorticator

R.K. Naik, C. S. Kar, G. Kar, S. Mitra and S.K. Jha

Project Code: In-house Project-JAE 3.6

The 'CRIJAF bast fibre decorticator' machine is developed to decorticate bark/ ribbon containing fibres from the freshly harvested plants like jute, mesta, hemp, sunnhemp and ramie etc. (Fig. 34 & 35). The mechanism of the machine is to decorticate/ separate the bark/ ribbon from the plant by breaking the inner wood/ stick into pieces. The principle involves first by breaking of plants through two rotating solid rollers and separation of bark/ ribbons from the broken sticks through another set of two high speed helical rollers. The principle involves feeding of plants through feeding chute by tip end in between the breaking rollers, which crushes the stick and then passing the crushed plants in between the separating rollers for separation of stick and bark. While passing of crushed plant in between separation roller, the broken sticks are separated from the bark and fall on the tray. The barks are ejected and rests on a hanging bar fitted some distance ahead from the outlet of the machine. The movement of plants is unidirectional and plant feeding into the machine is batch type. There is no damage to the bark/ ribbon due to breaking or separating rollers and hence no damage to the fibre. The machine can be operated with a 7.5-10.0 hp air cooled diesel engine to suit its operation in the field or 7.5 to 10 hp 3-phase electric motor. The machine can be operated using power tiller engine also. The machine employs simple technique to separate fibre from stick and hence, no specific skill is required to operate it.

Fig.34. CRIJAF Bast fibre decorticator

Fig.35. CRIJAF Bast fibre decorticator in operation

The machine is superior in terms of time for ribbon decortication than the existing available machines which involves two-way operation for complete ribbon extraction. The machine is very easy to use and no specific skill is required to operate or adjust the machine. The decortication of ribbon/ bark reduces about 60% of biomass for retting.

5.2 Mechanized harvesting of jute

R.K. Naik, S. Saha and G. Kar;

Project Code: In-house Project-JAE 3.7

Mechanized harvesting of jute crop was performed in line a sown field at ICAR-CRIJAF Farm with a tractor front mounted tall crop harvester (Fig. 36). The machine is driven through PTO of 35-55 hp tractor. It consists of crop row dividers, star wheel, cutter bar and 5 nos. of lugged canvas conveyor belts. During its operation the machine cuts the plants and conveys the cut plants in up-right position to the right side of the machine before dropping on the ground. After harvesting, the plant lies on the ground in line. The collection and bundling carried out manually. The field capacity of machine was found to be 0.16 ha/h at tractor forward speed of 4 km/h and cutting width of 2m. For mechanized jute harvesting, the conditions are to be considered are line sown crop with minimum thin plants, uniiform plant height and basal diameter, upright condition of plant, harvesting stage within 120 DAS and dry field condition for heavy machine movement.

Fig.36. Mechanized jute crop harvesting with tall crop harvester

6. Research Achievements of Concluded Projects during 2024-25

6.1 Leaf litter management: Decomposition and nutrient dynamics of leaf litter composts and its effects on JAF crops

A.K. Singh, S. Mitra, B. Majumdar, S.K. Sarkar, S. Satpathy, M.L. Roy and G. Kar

Project Code: In-house Project- JA 8.1

Leaf litter decomposition plays a pivotal role in nutrient cycling and directly influences the productivity of agricultural systems. This study highlighted clear differences in decomposition patterns and carbon (C) mineralization between two composting treatments BSC and BGSC. EM-treated composts exhibited significantly higher nitrogen (N) content, microbial biomass carbon (MBC), and concentrations of potassium, calcium, and magnesium. Notably, BSC compost supported higher seed germination rates and vigour index due to its optimal pH for seedling development. The initial biochemical composition and the C/N ratio of the decomposing material emerged as critical factors influencing mineralization efficiency. A key focus of the study was on reducing greenhouse gas (GHG) emissions through improved composting techniques. It was estimated that around 310 kg CO_2-equivalent emissions could be saved by adopting such composting methods, contributing to climate change mitigation through carbon sequestration and reduced dependence on mineral fertilizers.

Additionally, three cellulolytic bacterial strains B1S, B1M, and B1D were isolated and characterized, with *Bacillus stercosis* (B1S) showing the highest cellulase activity. These strains demonstrated strong enzymatic potential across a broad range of environmental conditions. Their inoculation significantly accelerated leaf litter decomposition, halving compost maturation time from 95 days to 50 days and enhancing compost quality. The synergistic action of B1S and B1D, particularly through high endoglucanase and β-glucosidase activities, was instrumental in improving degradation efficiency. Over a three-year period of field experiments on JAF crops, the study systematically evaluated the impact of compost substitution on soil organic carbon dynamics and crop yield. Treatments with higher organic compost content demonstrated improved carbon pool management and greater soil carbon sequestration. These improvements translated into increased yields of fibre crops such as jute, flax, and ramie. The results emphasize the potential for compost to replace or reduce synthetic fertilizer use while enhancing environmental sustainability and crop productivity. Further, the study investigated nodulation and nitrogen fixation patterns in sunnhemp across its growth stages. Timely incorporation of sunnhemp biomass significantly improved soil fertility by increasing nitrogen availability, offering a practical and eco-friendly strategy for nutrient management in green manuring systems. This practice supports reduced fertilizer dependency and fosters regenerative agricultural practices.

The research also explored the use of processed leaf litter compost in hydroponic systems. Compost tea yielded the highest nutrient concentrations, while the LLHN (Leaf Litter Hydroponic Nutrient) solution promoted better plant growth, nutrient uptake, and root zone stability compared to conventional chemical fertilizers. LLHN-grown spinach plants exhibited enhanced nitrate-nitrogen utilization and reduced nitrate accumulation, offering both agronomic and health advantages. Overall, the findings underscore the effectiveness of using selected cellulolytic bacterial consortia for rapid and efficient composting. Leaf litter compost, especially when integrated with EM and green manure crops like sunnhemp, presents a viable solution for sustainable organic waste management, soil fertility enhancement, and GHG emission reduction. Furthermore, compost-based hydroponics offer a sustainable, high-performance alternative to chemical inputs in controlled-environment agriculture. This study provides robust, field-level evidence to support farmers, policymakers, and stakeholders in adopting integrated organic strategies for resilient and sustainable agriculture.

Recommendations

i) **Accelerated composting & enhanced decomposition:** Modification of the EM solution reduced composting time from 90–95 days to 40 days, aided by B1S and B1D strains with high cellulase activities.

ii) **Improved soil carbon storage:** Compost and integrated treatments (50% NPK + 50% Compost) increased soil organic carbon (SOC) by 20–24%, with a 27–28% rise in the humus fraction and enhanced SOC sequestration rates.

iii) **Climate mitigation benefits:** Compost use reduced carbon emissions by 117 kg CO_2 eq/ha and contributed to greater resilience in SOC under RCP4.5 and RCP8.5 climate scenarios.

iv) **Yield maintenance & soil health:** Compost treatments sustained jute, ramie and flax fibre yields comparable to mineral fertilizers, with no observed toxicity.

v) **Sunnhemp for nitrogen management:** Fresh biomass from sunnhemp increased by 44% between 30–50 days, and green manure application improved soil nitrogen availability by up to 37.94%, especially ammonium-N.

vi) **Optimized green manure use:** Strategic incorporation of sunnhemp green manure can meet 40–50% of the nitrogen needs of the following crop, supporting integrated nutrient management and sustainable farming.

vii) **Alternative for hydroponic fertilizers:** Leaf litter compost-based nutrient solutions present a promising alternative for hydroponic fertilizers.

CROP PROTECTION

Overview

Productive agriculture systems are always vulnerable to hazards of climate, pests and diseases causing threat to crop production. In the changing climatic scenario, the crops are facing a wider range of pests and disease outbreaks and making the JAF crop production unstable. The Crop Protection Division takes up study on the incidence and crop losses caused by pests and pathogens, etiology and epidemiology of diseases, bio-ecology, biology of pests and developing integrated management schedules. The division is exploring new frontiers of research that may result into the development of appropriate technologies for jute and allied fibre crop protection which are effectively productive, eco-friendly, sustainable, and economically profitable.

Priorities & Thrust Areas

- Insect pests-plant interaction and the pathogen system in JAF crops
- Investigation on PGPR and biocontrol for pest and disease management in JAF crops
- Ecological behavioural and epidemiological studies on pests and diseases of JAF crops
- Standardization and validation of IPM technologies in JAF crops
- Exploring the ICT and related tools for pest management and pest forecasting in JAF crops.

Research Highlights (2025)

- Identification of jute germplasm lines (OIJ-136, OEX-011, OIN-082, OIN-008 and OIN-016) tolerant against yellow mite and wild germplasms of jute (WCIN 188, WCIN 092, WCIJ 123, and WCIN 009) l resistant source against jute semilooper
- Stem rot pathogen sclerotia germination in root exudates of resistant plants suppressed slcerotia germination of stem rot pathogen.
- Development of IPM module including moderately pest tolerant jute variety, JROBA 3 was developed
- Insecticide resistance against profenophos of jute hairy caterpillar
- Persistent toxicity of treating formulations of sole and combination product of dimide and neonicotinoid insecticides against early infesting lepiodopteran insects.
- Stage-specific thermal sensitivity of hairy caterpillar

Interaction between jute and the stem-rot pathogen at the pre-infection stage

K. Mandal, S. Dutta and D. Saha

Project Code : In-house Project- JM 9.7

The interaction between the host and the stem rot causing pathogen, *Macrophomina phaseolina* at the pre-infection stage, i.e. before they come in contact, is poorly studied. The influence of exudates from germinating jute seeds on the germination of pathogen propagules (sclerotia) was investigated. To collect root exudates, seedlings were grown in a hydroponic system (Fig.1). Seeds were surface sterilised with 0.1% $HgCl_2$ and germinated in sterile potato dextrose agar medium. The healthy seedlings were transferred to 0.5x Hoagland solution and incubated in an 18/6 h day/night cycle in a growing chamber. Root growth of white jute seedlings was good. However, tossa jute seedlings displayed abnormal root growth characterised by swollen root ends (Fig. 1). Also, under field conditions, waterlogging badly affects *tossa* jute growth. Hence, an alternative method was tried. Tossa jute seedlings (four on the right side) displaying abnormal roots with swollen ends.Two-day-old disease-free seedlings were transplanted in a magenta box containing black glass beads supplemented with ½ strength Hoagland solution (Fig.2). To maintain aerobic conditions at the root zone, an optimum level of liquid was maintained. For ease of collection of root exudates, a truncated pipette tip was inserted at one corner of the magenta box (Fig. 2). Seedlings were incubated under above-mentioned growing conditions. Exudates were collected when the seedlings were two weeks old.

Fig. 1. Jute seedlings grown in a hydroponic. Tossa jute seedlings (four on the right side) displaying abnormal roots with swollen ends.

Fig. 2. Seedlings raised in a Magenta box containing black glass beads.

It was observed that root exudates had a negative effect on pathogen germination. The untreated check recorded 71% sclerotial germination, while the treatment of root exudates from even a susceptible line (JRC-412) reduced it to 59%. Exudates from a field-resistant line (CIN-109) suppressed the sclerotia germination further to 51%.

Similarly, exudates from the germinating sclerotia were applied to jute seeds. Sclerotia suspension in 0.5x Hoagland solution was incubated at 30 °C. After 2 days of incubation, the sclerotia were separated from the incubating medium by centrifugation at 10,000 rpm for 5 min followed by passing through a syringe filter. Surface-sterilised jute seeds were incubated on filter paper moistened with sclerotia exudate. Seed germination was determined two days after incubation. It was observed that the sclerotia exudate did not affect seed germination significantly.

Assessment of stem rot resistance based on host-pathogen interaction in different jute varieties

C. Biswas, D. Barman, N.M. Alam, Thribhuvan R and P. Sinha

Project Code : In-house Project- JM 9.7

Field experiment was conducted with different jute varieties in 2025 to assess their reaction to stem rot disease. During the crop growth season RGB images of stem rot lesions from jute field were taken for host pathogen interaction to assess resistance to the disease. RGB images were taken from all the varieties during the crop growth period. Image analysis was done using ImageJ software. Based on thresholding technique infected portion was separated for estimation of lesion area for comparison among different genotypes for stem rot response (Fig 3). Relative resistance in terms of lesion area could be used to estimate relative resistance among the genotypes based on the following formula: Relative resistance (for lesion area) = 1- lesion area of test genotypes/lesion area of the most susceptible genotypes.

Based on image analysis of stem rot lesions, the *tossa* jute varieties namely, JRO524 and JRO128 were found susceptible to stem rot (SR), whereas JRO632, JRO878 and JRO66 showed partial resistance against SR. Two varieties, Sudan green and Tanganika 1 were found more resistant. The major objective of the project is phenotyping stem rot resistance in jute, based on digital image processing and detection of jute stem rot disease by applying Deep learning networks. Large number of stem rot images from at least 400-500 genotypes would help to develop a digital app to identify resistance based on image in future.

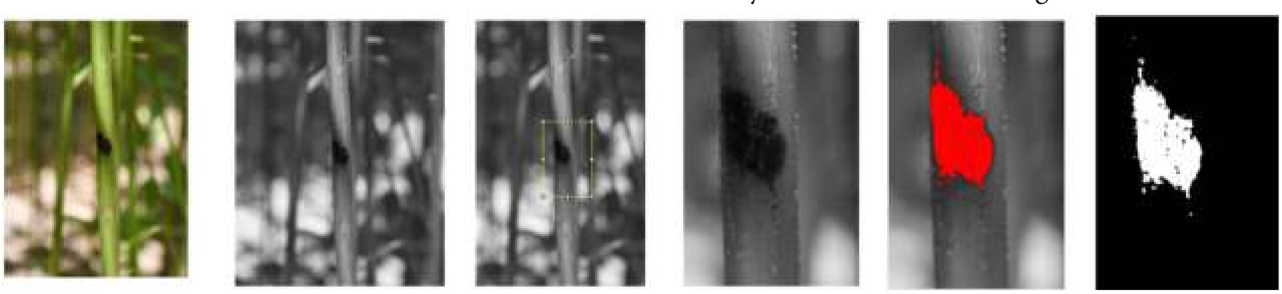


Fig.3 Steps of Image analysis of individual lesion by ImageJ

Characterization and quantification of midgut homogenates of insecticide-resistant *Spodoptera litura* larvae

V. Ramesh Babu, Chinmay Biswas and S. Satpathy

Project Code : In-house Project- JM 9.7

Leaf dip bioassays were carried out with the third instar larvae of second filial generation (F_2) of the lepidopteran pest, indigo caterpillar *Spodoptera litura* infesting jute against commonly used organophosphorus insecticide profenophos (Carina 50% EC). The LC_{50} deduced for indigo caterpillar *S. litura* 24 HAT was 1218.7 ppm. The bioassay results clearly depicted that *S. litura* in F_2 generation developed 1.98-folds resistance ratio over the F_1 generation (616.71 ppm).

***Carboxylesterase assay*:** Carboxylesterase activity was determined by the method of Van Asperen with necessary modifications and α-naphthyl acetate as a substrate. Substrate solution of 1-naphthyl acetate @0.3mM was prepared in acetone. The assay mixture contained 15l of enzyme preparation, 0.5ml of 50mM sodium phosphate buffer pH 7.4, and 800L of 0.3mM substrate solution. The mixture was incubated at 30C for 30 minutes. Finally, 200μl of 0.1% tetrazotized *o*-dianisidine (Fast blue B) in 3.5% SDS was added and incubated for 20 minutes at room temperature in the dark The α-naphthol formation was measured at 590nm. The enzyme activity was calculated from a α-naphthol standard curve. The enzyme titres quantified were AchE-779.23 µmoles/min/mg protein and CarE -879.14 (µmoles/min/mg protein) respectively.

Esterase isozyme studies: Native PAGE with 10 per cent resolving gel was performed as per Davis to separate esterase isozymes. Qualitative changes in esterase banding pattern was performed using the F_2 generation larvae that were reared after surviving the insecticidal bioassay with profenophos. 5µg protein concentrations of the mid-gut homogenate per well were loaded onto the native PAGE and run at a constant voltage of 90 for 45 minutes. Gels were stained briefly for esterase activity with freshly prepared 0.05 per cent(w/v) α - napthyl acetate and 0.1 per cent(w/v) fast blue B in 50mM phosphate buffer pH 7.4. For inhibition studies, gels were cut into strips and incubated in 10^{-4}M and 10^{-6}M eserine sulphate and 10^{-4}M DDVP individually in 50mM phosphate buffer pH 7.4 for 30 minutes at 28°C with occasional shaking. Control gels were incubated for 30 minutes in buffer alone. All the gel strips were stained and incubated for 30min in α - napthyl acetate substrate diazonium mixture for confirming the esterase activity.

Esterase activity visualized in native PAGE following incubation in substrate solution (0.05 per cent α-naphthyl acetate in 0.1 per cent fast blue (R) revealed two isozyme bands. The major band with diffused esterase activity was relatively of more molecular mass than the other esterase activity band which was faint in nature. Difference in esterase banding pattern in *S. litura* population was observed when using midgut and whole body extracts. The midgut produced all three types of esterase bands while whole body homogenates produced only two bands. Inhibitor studies with the esterase isozymes separated under native PAGE when subjected to inhibition by incubating with class specific esterase inhibitors in buffers containing dichlorvos (DDVP)10^{-4} M, eserine sulphate, 10^{-6} and 10^{-4} M concentrations indicated that these two esterase isozymes are B type esterases as eserine sulphate, a specific inhibitor of cholinesterase did not inhibit the esterase activites at 10^{-6} and 10^{-4} M concentrations and esterases were characterized to have carboxylesterase activity. Synergism studies with three synergists viz., triphenyl phosphate (TPP), piperonyl butoxide (PBO) and diethyl maleate (DEM) revealed that triphenyl phosphate was effective in decreasing the median lethal concentration from 1525 ppm with profenophos (solo) to 393.8ppm (in combination), the synergism ratio deduced for profenophos: TPP (10:1) was 3.88.

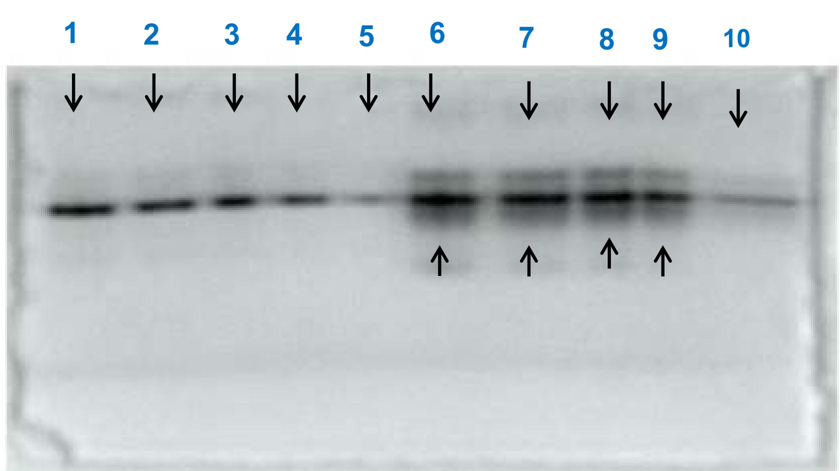


Fig.4 Carboxylesterase, profiles from whole body and midgut homogenates of *S. litura* larvae Lanes 1-5: whole body homogenates showing two bands of esterase isozymes Lanes 6-10: midgut homogenates showing three bands of esterase isozymes

Development of IPM module for jute and mesta

Rajib Kumar De, S. Satpathy, V. Ramesh Babu and Shamna A.

Institute project : JM 9.4. Development of IPM module for jute and mesta

Evaluation of different IPM modules for jute

Seven different IPM modules (Table 1) were designed against pest complexes (comprising of stem rot disease, grey weevil, semilooper, stem weevil and yellow mite) of jute ecosystem (variety JROBA 3) and their efficacy were tested and compared for the eco-friendliness and farmers' practice in randomised block design with three replications. It was observed that, IPM module- M1 consisting of pre-sowing soil application of neem cake @ 50g/sq m, combined seed treatment using carbendazim 50 WP @ 2 g + imidacloprid 17.1% @ 4 ml/kg followed by three sprays of acaricide, spiromesifen 240 SC @ 0.7 ml/litre, insecticide λ-cyhalothrin 5 EC @ 0.6 ml/litre and fungicide, tebuconazole 250 EC (25.9% w/w) @ 1.0 ml/litre at an interval of 10 days beginning at 30 DAS brought down infestation levels of stem rot, hairy caterpillar, grey weevil, yellow mite, semilooper and apion to a minimum of 0.4 – 3.7% compared to 3.9-17.9% in the farmers' actual practice with highest dry fibre yield of 41.5 q/ha. M1 module was followed by M6 with mmiscellaneous package of soil and seed treatment and only one spray of chloropyriphos 20% EC @ 2 ml/litre at 40 DAS with 36.9 q/ha fibre yield and M2 with pre-sowing soil application of *Pseudomonas fluorescens*, seed treatment with *Trichoderma viride* and spraying of neem oil, NSKE and Bt formulation with 36.4 q/ha fibre yield. M4 comprising of hot water seed treatment at 52-55 °C for 2-3 minutes and use of neem oil and NSKE exhibited 35.6 q/ha fibre yield. Lowest fibre yield (31.6 q/ha) was obtained with farmers' practice with ploughing + 2 manual weedings/ thinning at 12-15 and 25-30 DAS and one insecticidal spray (Table 2).

Table 1. Components of different IPM modules for management of major insect pests and diseases of jute

Mod-ules	Soil application	Seed treatment	First spray	Second spray	Third spray
	Before sowing	**Before sowing**	**@ 30 DAS**	**@ 40 DAS**	**@ 50 DAS**
M1	Neem cake @ 50g/sq m	carbendazim @ 2 g + imidacloprid @ 4 ml/kg	spiromesifen 240 SC @ 0.7 ml/litre or abamectin 1.8 EC @ 0.5 mi/litre	λ-cyhalothrin 5 EC @ 0.6 ml/litre	tebuconazole **250 EC (25.9% w/w)** @ 1.0 ml/litre
M2	1kg *Pseudomonas fluorescens* in 100 kg FYM/ha	*Trichoderma viride* @ 10 g/kg	Neem oil @ 10 ml/litre	Bt formulation 3 g/litre or NPV 200 LE	NSKE @ 10 ml/litre
M3	Sunnhemp green manuring + deep ploughing	Hot water at 52-55 °C for 2-3 minutes	Pheromone traps @ 12 /ha before sowing	Light trap with mercury lamp 1 /ha	Destruction of egg masses/ larvae/ adults and infected plants @ 10-15 day interval
M4	-	Hot water at 52-55 °C for 2-3 minutes	Neem oil @ 10 ml/litre	NSKE @ 10 ml/litre	NSKE @ 10 ml/litre
M5	-	carbendazim @ 2 g /kg	-	NSKE @ 10 ml/litre	-
M6	Neem cake @ 50g/sq m	carbendazim @ 2 g + imidacloprid @ 4 ml/kg	-	Chloropyriphos @ 2 ml/litre	-
FP	Ploughing + 2 manual weedings/ thinning @ 12-15 and 25-30 DAS	-	-	Chloropyriphos @ 2 ml/litre	-

Table 2. Effect of different IPM modules against pest complexes of jute ecosystem (variety JROBA 3)

Treatments	Stem rot	Hairy caterpillar	Grey weevil	Yellow mite	Semilooper	Apion	Fibre yield q/ha
M1	1.9 (7.8)	0.4 (3.8)	2.3 (8.7)	3.7 (11.1)	1.3 (6.6)	1.1 (6.0)	41.5
M2	4.5 (12.3)	1.4 (6.8)	5.2 (13.2)	7.7 (16.1)	2.3 (8.8)	2.3 (8.8)	36.4
M3	5.1 (13.0)	1.3 (6.5)	4.4 (12.1)	10.0 (18.4)	3.4 (10.7)	2.4 (8.8)	35.4
M4	4.6 (12.3)	1.4 (6.7)	4.5 (12.3)	11.5 (19.9)	4.8 (12.6)	2.5 (9.1)	35.6
M5	4.7 (12.4)	12.4 (8.6)	4.4 (12.0)	13.8 (21.8)	5.5 (13.5)	2.8 (9.6)	34.3
M6	4.5 (12.4)	2.0 (8.1)	6.4 (14.5)	15.6 (23.3)	6.5 (14.8)	4.4 (12.1)	36.9
FP	11.5 (19.6)	3.9 (11.4)	11.0 (19.4)	17.9 (25.0)	7.8 (16.2)	5.9 (14.1)	31.6
CD (P= .05)	(1.2)	(1.8)	(2.6)	(1.3)	(1.2)	(0.9)	1.2
SE±m	(0.5)	(0.8)	(1.2)	(0.6)	(0.5)	(0.4)	0.5

* *Figures in the parentheses indicate the Arc sine transformed values.*

Evaluation of different IPM modules for mesta

In case of mesta variety JBMP 2 pest ecosystem, chemical IPM module (Table 3) was the best against all the major diseases, namely, foot and stem rot, collar rot, phoma blight and yellow mosaic with minimum incidence of all diseases (2.4 -3.2%) compared to the treatment with farmers' own practice showed highest incidences (12.4 – 21.5%). Chemical IPM module was followed by bio- IPM module with 4.6% in case of foot and stem rot, cultural IPM module with 4.5% collar rot and 5.3% Phoma blight in case of organic IPM module. Yellow mosaic was lowest (3.1%) in chemical IPM module and it was followed by bio- IPM module (8%), organic IPM module (8.7%) and Cultural IPM module (10.7%) (Table 3).

Table 3. Effect of different IPM modules against disease complexes of mesta (variety JBMP 2)

	Treatment with	Foot and stem rot	Collar rot	Phoma blight	Yellow mosaic
T1	Organic IPM module	5.8(14.1)	4.5 (12.2)	5.3 (13.2)	8.7 (17.1)
T2	Bio- IPM module	4.6 (12.5)	5.4 (13.4)	6.5 (14.7)	8.0 (16.4)
T3	Cultural IPM module	5.4 (13.4)	4.7 (12.5)	8.2 (16.5)	10.7 (19.1)
T4	Chemical IPM module	2.4 (9.1)	2.6 (9.3)	3.2 (10.3)	3.1 (10.1)
T5	Miscellaneous IPM	5.3 (13.1)	4.9 (12.7)	6.1 (14.3)	15.3 (23.0)
T6	Easy IPM	4.8 (12.7)	6.9 (15.0)	6.9 (15.2)	16.6 (24.0)
T7	Farmers' own practice	14.4 (22.1)	12.5 (20.7)	12.4 (20.6)	21.5 (27.6)
	CD (5%)	(1.5)	(2.8)	(2.2)	(1.4)
	SEm+	(0.7)	(1.3)	(1.0)	(0.6)

* Figures in the parentheses indicate the Arc sine transformed values.

Again, chemical IPM module (Table 4) was the best against all the major insect pests, namely, spiral borer, flea beetle, mealy bug and jassids with last infestation of all (1.2 – 1.8%) compared to the treatment with farmers' own practice showed highest incidences (6.8 – 11.1%). Chemical IPM module was followed by bio- IPM module with 2.4% in case of flea beetle, cultural IPM module with 2.5% spiral borer and 2.7% mealy bug. Jassids infestation was lowest (1.8%) in chemical IPM module and it was followed by bio- IPM module (2.1%), organic IPM module and Cultural IPM module (both 2.7%). Highest fibre yield (25.9 q/ha) was observed in chemical IPM with 37.7% increase over check and it was followed by cultural IPM module with (22 q/ha) with 16.8% increase over check with 18.8 q/ha fibre (Table 4).

Table 4. Effect of different IPM modules against insect pest complexes of mesta (variety JBMP 2)

	Treatment with	Spiral borer*	Flea beetle*	Mealy bug*	Jassids*	Fibre Yield q/ha	% Increase over Control
T1	Organic IPM module	3.1 (10.1)	3.2 (10.3)	4.0 (11.5)	2.7 (9.5)	21.5	14.2
T2	Bio- IPM module	2.3 (8.7)	2.4 (8.9)	2.8 (9.6)	2.1 (8.3)	20.8	10.6
T3	Cultural IPM module	2.5 (9.1)	2.5 (9.1)	2.7 (9.3)	2.7 (9.3)	22.0	16.8
T4	Chemical IPM module	1.2 (6.2)	1.3 (6.6)	1.8 (7.7)	1.8 (7.6)	25.9	37.7
T5	Miscellaneous IPM	3.1 (10.1)	3.1 (10.1)	3.9 (11.4)	4.7 (12.5)	21.8	15.9
T6	Easy IPM	4.6 (12.4)	4.6 (12.4)	4.6 (12.4)	5.0 (12.9)	21.2	12.4
T7	Farmers' own practice	6.8 (15.0)	9.8 (18.2)	10.9 (19.2)	11.1 (19.5)	18.8	-
	CD (5%)	(1.2)	(1.6)	(1.6)	(1.6)	2.0	-
	SEm+	(0.6)	(0.7)	(0.7)	(0.7)	0.9	-

** Figures in the parentheses indicate the Arc sine transformed values.*

Integration of protection management technology for insect pests of jute in on -farm system

S. Satpathy, V. Ramesh Babu, S. P. Mazumdar, S. K. Sarkar and M. L. Roy

Project Code : In-house Project : J.E. 2.5

Diversity of insect pests and natural enemies in farmers field condition

In recent years, it is being noticed that some pests of jute namely, mite, indigo caterpillar, hairy caterpillar, mealybug and semilooper emerged as the major impediments in jute cultivation on large scale in farmer's field, in contrast to that no such upsurge or severity of infestation have been recorded in the research farm of ICAR-CRIJAF.

The type of cropping sequence, presence of favourable alternate hosts during and prior to the cropping season and prevalence of specific crop micro-climate are the reasons for such diversity of insect pests and natural enemies. Infestation of lepidopteran pests occurring at different phenological stage of the crop is quite inconsistent depending on the cropping.

g system, weather condition and crop management practices adopted by the farmers. Particularly during the post sowing period from 15- 30 DAS, the jute crop in farmer's field generally suffer from indigo caterpillar damage. Although the damage intensity of this pest has increased to the extent of resowing of crop due to heavy damage involving *Spodoptera spp*. complex, recently more than 90 % of such damages are caused by gram pod borer, *Helicoverpa armigera* instead of *Spodoptera spp*. Complex. The damage caused by both the species does not happen in CRIJAF Farm.

Fig. 5 Infestation of gram pod borer, *Helicoverpa armigera* in jute seedlings

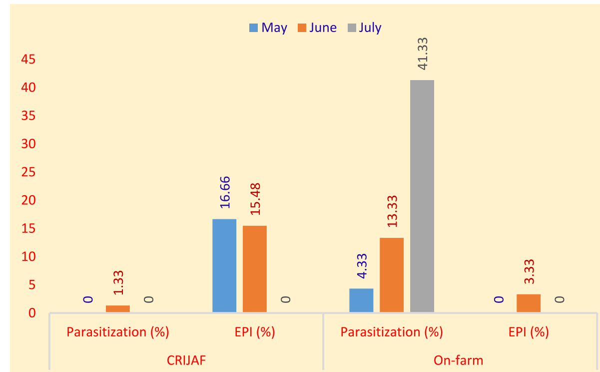


Fig. 6. Extent of prasitization by NE and EPI on hairy caterpillar

To study the diversity of natural enemies, larval population of hairy caterpillar were collected from farmer's field (Beraberi, North 24 Parganas) as well as CRIJAF Research Farm during May to July, 2025 and reared in the laboratory in replicated samples to observe the emergence of natural enemies and infection of entomopathogens. The extent natural enemy activity and infection of entomopthogens was different on the population collected from farmer's field and CRIJAF Farm. The larval parasite, *Meteorus spilosomae* was more prevalent on the hairy caterpillar population collected from farmer's field. The extent of parasitization in such insects was 4.33% - 41.33 % during May to July which was only 1.33% on the population obtained from CRIJAF farm. The EPI in the hairy caterpillars collected from CRIJAF farm and farmers' field during June was 3.33% and 1.33% respectively.

Persistent toxicity evaluation of insecticides against early-season insect pest of jute applied through seed treatment

In recent years, the complexity of infestation and damage by early season lepidopteran pests in *tossa* jute has changed. Major pre-disposing factor for this is the type of crops grown by the farmers in the jute production system. During last 2-3 seasons the intensity of pod borer instead of indigo caterpillar has been reported in jute growing areas of North 24 Pgs. The common type of plant damage is the defoliation and cutting of the seedling from the base that required re-sowing by few farmers. In this background, toxicity of new seed treating insecticides for preventive control of these early-season lepidopteran pests of jute was determined under laboratory condition. Bioassay with detached-leaf from the seed-treated plants against 5-day old larvae of the insect was conducted to establish persistent toxicity of seed treating insecticides against early infesting lepidopteran insects.

The seed treating formulations of sole and combination product of dimide and neonicotinoid insecticides including imidacloprid 600 FS (4, 5 and 6 ml/kg), cyantraniliprole 19.8 % + thiamethoxam 19.8 % FS (5, 7 and 9 ml per kg), chlorantraniliprole 62.5 % FS (5, 7 and 9 ml per kg) were evaluated CRD with 5 replications under laboratory condition. The mortality of the 5-day old larvae after feeding for 48 hrs on the detached leaf from the seed treated plants was recorded to judge the relative toxicity of the insecticides. Till 20 DAS, all the seed treating insecticides caused above 90% mortality on 5-day old larvae. The effect persisted up to 40 DAS and significantly highest mortality (87.45%) was in case of Chlorantraniliprole 62.5 FS @ 9 ml/kg followed by Chlorantraniliprole 62.5 FS @ 7 ml/kg and imidacloprid 600 FS @ 6 ml/kg.

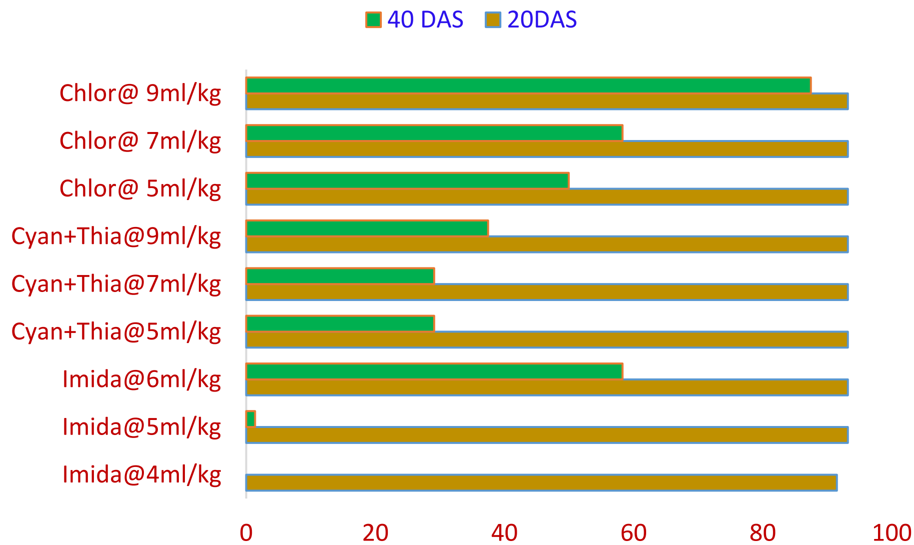


Fig.7 Insect mortality (%) at different plant growth stage caused by seed treating insecticides

Fig. 8. Chlorantraniliprole 62.5 FS @ 9 ml/kg treatment showing complete mortality and jute plants raised from seed treated with insecticides used for detached leaf bioassay

Effect of seed treatment with insecticides on germination and seed vigor of jute

The effect of seed treating insecticides evaluated for toxicity against early season insect pests of jute crop were studied for its effect on seed germination and seedling vigor. The germination (%) in the treatments varied from 79-90% compared to 91% in the untreated control. Seed treatment with Imidacloprid 600 FS @ 6ml/kg only had significantly less germination than control. There was no adverse effect of seed treatment on seedling dry weight and seedling vigor with no significant difference of these parameters from control.

Table 5. Effect of seed treatment with insecticides on germination, vigour index and seedling dry weight

Treatments	Germination %)	Vigour Index	Seedling dry wt (g)
T1 - Imidacloprid 600 FS @ 4ml/kg	90.00a	1138.6a	12.65a
T2 - Imidacloprid 600 FS @ 5ml/kg	85.00ab	1204.9a	14.17a
T3 - Imidacloprid 600 FS @ 6ml/kg	79.00b	1178.1a	15.07a
T4 - Cyantraniliprole 19.8% + Thiamethoxam 19.8% FS @5ml/kg	90.00a	1232.8a	13.65a
T5 - Cyantraniliprole 19.8% + Thiamethoxam 19.8% FS @7ml/kg	89.00a	1440.8a	16.17a
T6 - Cyantraniliprole 19.8% + Thiamethoxam 19.8% FS @9ml/kg	85.00ab	1150.2a	13.42a
T7 - Chlorantraniliprole 62.5% FS @ 5ml/kg	87.00a	1154.2a	13.42a
T8 - Chlorantraniliprole 62.5% FS @ 7ml/kg	84.00ab	1247.5a	14.92a
T9 - Chlorantraniliprole 62.5% FS @ 9ml/kg	83.00ab	1239.2a	15.00a
T10 - CONTROL	91.00a	1398.5a	15.40a
LSD (P=0.05)	7.09	323.75	3.69

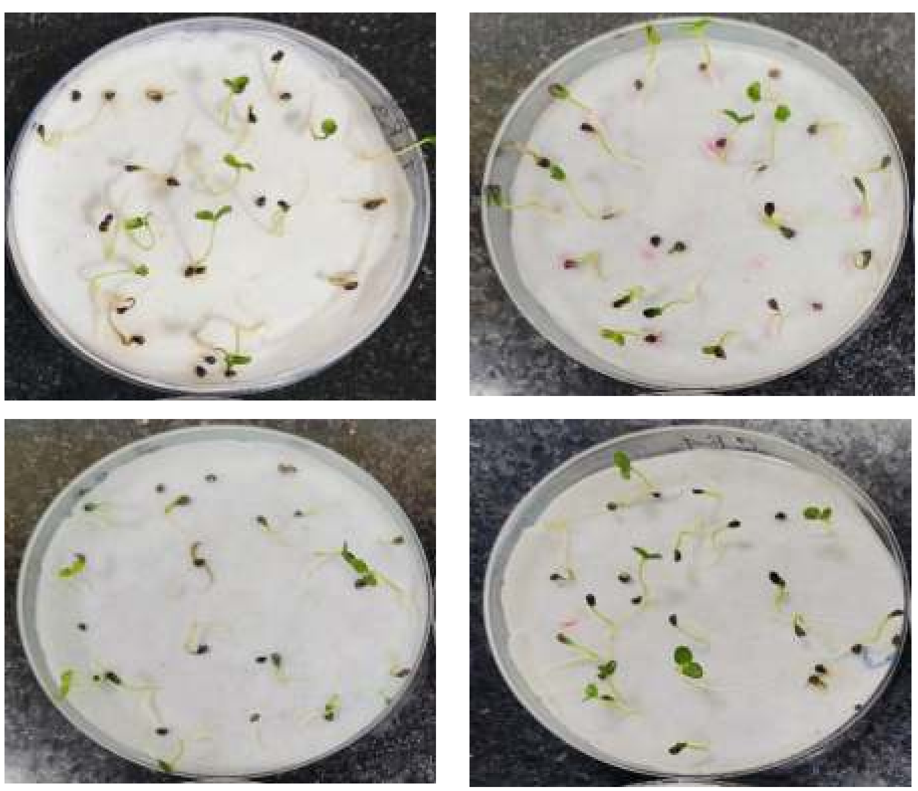


Fig. 9 Status of germination of jute seed treated with imidacloprid, cyantraniliprole + thiamethoxam, chlorantraniliprole and control

Integrated management of early-season lepidopteran pests and yellow mite of jute inon-farm jute production system

The on-farm field experiment was conducted at Beraberi village of North 24 Parganas District to evaluate the effect of mite tolerant varieties, soil S application (@40 kg/ha) and spray of Chlorantraniliprole (18.5% SC) for management of yellow mite and early season lepidopteran pests. Need based spray of Chlorantraniliprole (18.5% SC) was applied to check the alarming level of infestation of indigo caterpillar / *Heliocoverpa armigera*. The prevalent cropping system among the farmers are Jute-Vegetables/Potato-Onion, Jute-Rice-Lentil/Mustard and Jute-Vegetables-Lentil/Mustard. Most of the farmers grow JRO 204, JRO 524, CO 58 and JROBA 3 varieties of jute. The crops like tomato, onion, okra and other weeds act as alternate hosts for the insect pest of jute. The pre-sowing pH of the soil was 6.90. The initial soil sulphur level of the project field was 5005 PPM. During the crop establishment stage, the plant damage caused by *H. armigera* among the 3 jute varieties, varied from 42.55% in JROBA 3 to 66.39% in JRO-204. The plant damage level and larval population density was significantly less in the treatments having preventive soil sulphur application and Chlorantraniliprole spray. JROBA3 variety with soil Sulphur and insecticide application recorded least plant damage (22.05%), larval density (1.33/m^2) and damage grade (1.00) compared to 53.42%, 3.00/m^2 and 2.67 respectively in case of JRO-204. These parameters were significantly more in the unprotected crop. Maximum plant damage (66.33%), larval density (6.67/m^2) and damage grade (4.67) was recorded in the control plot of JRO 204 variety.

Among the 3 varieties, preventive application of soil S and insecticide spray reduced the plant damage by 19.69% to 39.09% and the insect population density by 15.00 to 55.02%.

Fig. 10. Untreated (left) and Treated (right) plot of jute var. JROBA3

Although, the mite population was density was moderate, JROBA3 and JROG 1 variety suffered less (23.55-22.17/cm^2) compared to 31.67/cm^2 in case of JRO 204. Preventive soil Sulphur application suppressed the mite infestation that reduced the population density to the extent of 19.12 % in JROG 1 to 40.29% in JROBA3. The yield of the three jute varieties i.e., JROBA3, JROG 1 and JRO 204 along with preventive control measures were 35.16, 32.23 and 33.33 q/ha respectively compared to 29.96-32.25 q/ha in control. Even after the soil sulphur application, no significant change in soil pH was observed. Post-crop soil pH was 6.85 compared to 6.90 at the pre-sowing stage. The sulphur content of the soil was slightly reduced after the crop and was 2.80 PPM compared to the pre-sowing period.

Temperature-Dependent Development of jute Hairy Caterpillar

N. M. Alam, S. Satpathy and C. Chattopadhyaya

Project Code : In-house Project JE 2.2

Larval and pupal stages of the Bihar hairy caterpillar were maintained under six constant temperatures to quantify temperature effects on developmental rate. Development rates were fitted using seven non-linear models, with model selection based on Akaike Information Criterion (AIC). The Taylor model provided the best fit for both stages. Parameter estimates of the model for larva and pupa development rate is presented in Table 6. Optimum temperature was estimated as 36.7 °C for larvae and 31.5 °C for pupae (Fig. 11), indicating stage-specific thermal sensitivity. Residual normality tests confirmed model adequacy. The results support the use of non-linear temperature-dependent models for phenology prediction and climate-based pest forecasting.

Table 6. Optimum temperature estimates from selected model

Parameters	Estimate		Std.Error		t-value		Pr(>|t|)	
	Larva	Pupa	Larva	Pupa	Larva	Pupa	Larva	Pupa
R_m	0.103	0.052	0.008	0.009	12.376	5.515	0.006	0.012
T_m	36.69	31.512	7.107	2.054	5.162	15.288	0.036	0.001
T_o	18.28	9.368	9.724	2.565	1.88	3.652	0.201	0.035

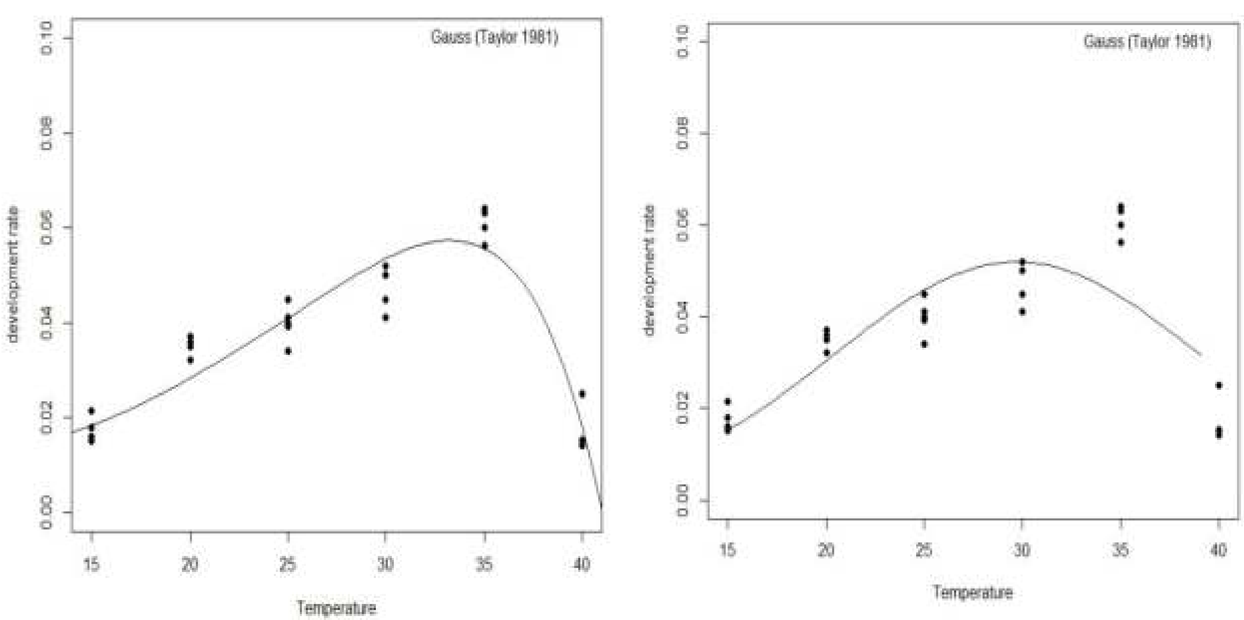


Fig.11: Observed and fitted development rates of Bihar hairy caterpillar larvae and pupae across six constant temperatures using the Taylor model.

KRISHI VIGYAN KENDRA

Krishi Vigyan Kendra

ICAR-CRIJAF manages two Krishi Vigyan Kendras—KVK Burdwan and KVK North 24 Parganas (Additional). Both KVKs have implemented a wide range of On-Farm Trials (OFTs), Front Line Demonstrations (FLDs), and training programs aimed at disseminating improved agricultural technologies and enhancing the knowledge and skills of farmers, farm women, rural youth, and extension personnel. Additionally, various extension activities such as method demonstrations, field days, exposure visits and Technology Week programs were conducted in coordination with ICAR-CRIJAF and ICAR-ATARI. The key achievements of these KVKs are presented below.

On-Farm Trials (OFTs)

The following OFTs were conducted by KVK, Burdwan

a. One OFT was conducted on the Assessment of different doses of sulfur application in mustard under the medium upland situation of Purba Bardhaman. Results indicated that application of sulphur @ 40 kg/ha (12.6 q/ha) and 30 kg/ha (12.2 q/ha) resulted in comparable productivities and were significantly higher than application @ 20 kg/ha (10.8 q/ha) or farmers' practice (9.4 q/ha; 80:40:40 NPK through 10:26:26 and urea). However, the application of 20 kg/ha of sulphur resulted in significantly higher productivity compared to the farmers' practice.

b. One OFT was conducted on "Assessment of humic acid and hydrogel in production of potato in jute-based cropping system". Results indicated that the recommended dose of fertilisers along with Humic acid @4kg/ha (yield 293 q/ha) as well as the recommended dose of fertilisers along with Hydrogel 5kg/ha (yield 303 q/ha) were almost at par in improving yield and reduction of fertilizer use in comparison to check (yield 270 q/ha).

c. Another OFT on "Assessment of different doses of sulfur application in rabi onion in Purba Bardhaman" was conducted, and the application of sulfur significantly increases the yield by 10 to 15 %. Though significant variation was not found between the 20 kg and 40 kg of sulfur application per ha. Better yield (215 q/ ha in comparison to 190 q/ha at farmers' practice) and B: C ratio 2.21 was obtained with 40 kg sulfur application per ha along with the recommended dose of fertilisers.

d. An OFT was conducted to evaluate the efficacy of CIFA-formulated farm-made feed at varying rations (1 & 3% of body weight) for enhancing fish productivity. The findings revealed that fish in the treatment group fed at 3% of body weight exhibited significantly ($p < 0.05$) superior technical performance, resulting in 33% and 25% higher biomass yields relative to the control (unequally rationed feeding) and other treatment group, respectively.

e. An OFT was conducted for assessment of technologies like use of nylon net, root dipping and use of insecticide for managing leaf curl disease in tomato. The findings revealed that seedling raising of tomato through protected nursery, covering the nursery by insect proof nylon net of 40 mesh size followed by 4 sprays (10 days interval) of Spiromesifen 240 SC (22.9 % w/w) @ 1 ml/ litre of water on standing crop resulted higher yield 37.52 t/ha rather than lower yield in farmers' practice 26.35 t/ha.

Table 1. List of OFTs conducted by the KVK, North 24 Parganas (Additional)

Crop/ Livestock	Title of the OFT
Cropping system	On-Farm Evaluation of Improved Varieties for Enhancing Productivity and Profitability in Jute - Based Cropping Systems. (GB 3- Pusa Ageti/PM 28- JRO 204)
Jute	Effect of Green manuring on Soil Health in Jute crop
Tomato	Assessment of tomato varieties Arka Rakshak, Arka Samrat, Kashi Adarsh
Garlic	Assessment of improved garlic varieties - Yamuna Safed 3 & Yamuna Safed 5
Jack fruit	Assessment of different treatments to increase shelf life of RTC (Ready to Cook)tender Jackfruit.
Elephant foot yam	Assessment of ready to fry elephant foot yam fingers
Cattle/buffalo	Detection of Subclinical Mastitis (SCM) by Modified California Mastitis Test (MCMT), Modifed White Side Test (MWST) and Surf Field Mastitis Test (SFMT) (2 nd Year)
Fodder	Assessment of salt-tolerant fodder grasses for green fodder production in saline soils of West Bengal
Fisheries	Assessment of growth performance of air breathing fishes in jute retting ponds (2nd Year)
Fisheries	Assessment of growth and production potential of Indian butter catfish (*Ompok bimaculatus*) in an IMC integrated farming system

OFT activities by KVK, North 24 Parganas (Additional)

2. Frontline Demonstrations (FLDs)

A total of around 500 FLDs were conducted by both the KVKs during 2025 on various crops like paddy, jute, tomato, onion, garlic, potato, mushroom and also on livestock and fisheries. There was significant increase in productivity of all the demonstrated crops and livestock under improved practices over conventional practices. The salient findings of the FLDs are given in Table -2

Table 2. List of FLDs of different technologies

Crop/Livestock (No of FLDs)	Technology demonstrated	Results
	KVK, Burdwan	
Mustard (50)	Nutrient management (80:40:40 NPK + S @ 20 kg/ha + Spray of boron 20% two times)	The demonstration was initiated in Rabi 2024-25 and crop was harvested in February 2025. There was 16.3 % increase in productivity of mustard in improved practice (11.4 q/ha) over local check (9.8 q/ha). Average B:C ratio was 1.89 in improved practice as compared to farmers practice (1.45).
Jute (50)	ICM (Seed treatment+ Use of seed drill/cycle weeder+ 80:40:40 NPK+retting with CRIJAF SONA)	There was 10.7 % increase in productivity of jute in improved practice (36.4 q/ha) over local check (32.5 q/ha). However, average B:C ratio was 2.69 (in the range of 2.24 – 3.17) as farmers fetched very high price for jute fibre this year (Rs. 7000 – 8200/qtl)
Potato (15)	Late blight disease management	There was a 14% increase in potato productivity in improved practice (310 q/ha) compared to the local check (272 q/ha), with a BCR of 1.96.
Fish *(Labeo bata)* (7)	Introduction of the cultural practice of minor carp, *Labeo bata* in the multi-species culture practice	Incorporation of *Labeo bata* as a supplementary species in polyculture ponds yielded a 9% increase in overall productivity, attributed to enhanced resource utilization and niche partitioning among co-cultured species.
Fish medicine (CIFAX) (10)	CIFAX as a control measure of Epizootic ulcerative syndrome (EUS) in IMC	Efficacy of CIFAX in mitigating Epizootic Ulcerative Syndrome (EUS) in Indian Major Carps (IMC) treated with CIFAX, improved survivalrates by 40% in IMC afflicted with EUS, reducing mortality from fungal-bacterial co-infections (*Aphanomyces invadans* and secondary pathogens).
Oyster Mushroom (10)	*Treatment of machine cut paddy straw* @ 10 kgs of dry machine cut paddy straw is to be dipped in 100 litres of clean water, treated with 10 gm carbendazim 50% W.P, 30 gm calcium carbonate and 120 ml formaldehyde for 10-12 hours.	There was a 28.4 % increase in the productivity of fresh Mushroom in improved practice (95 Kg/100 mushroom beds) over the local check (74 Kg/100 mushroom beds)
Brinjal (20)	Integrated Pest management on *Leucinodes orbonalis* on brinjal in Integrated farming system.	An increment of 21.9% change in yield was obtained with IPM (289q/ha) as compared to Farmers' practice (237q/ha).

KVK, North 24 Parganas (Additional)		
Jute (25)	Variety-JRO 204	Variety JRO 204: Fibre yield=34.3 q/ha, BC ratio=1.42Check: Fibre yield=26.43q/ha, BC ratio=1.16
Jute (15)	Improved retting of jute by 'CRIJAF Sona' powder & lquid	CRIJAF Sona (Powder) : Retting Time (Days)=12.8 ,Fibre strength (g/tex) =23.00, Root content=6.30 %CRIJAF Sona (Liquid): Retting Time (Days)=11.10, Fibre strength (g/tex) =25.10, Root content=2.6 %. Control: Retting Time (Days)=17.50, Fibre strength (g/tex) =19.75, Root content=10.65 %
Rice(10)	Variety- MTU 1153	Variety – MTU 1153; Plant height - 98 cm; No. of tillers/plant – 20.5, No. of effective tillers per plant – 14.8, No. of panicles/m2 – 284, Test weight – 24.3g, Yield / ha - 4.36 t/ha
Rice (60)	Variety- CR Dhan 800	Ongoing
Mustard (30)	Variety: PM 28	Ongoing
Lentil(15)	Variety : Pusa Ageti	Ongoing
Cowpea (10)	Kashi Kanchan	Cowpea var. Kashi Kanchan; Plant height:56.4cm; Pods/plant: 28.4 nos; Pod length: 22.4 cm; Yield/ha: 10.86t/ha
Mushroom(250)	Oyster mushroom	Ongoing
Coloured cauliflower(10)	Carotena	Ongoing
Banana(200)	Banana bunch cover technology	Ongoing
Vegetables, fruits, spices and medicinal herbs(10)	Nutrition garden	Ongoing
Processing(10)	Popularization of Fish wafers	Ongoing
Goat(50)	Area specific mineral mixture [Kalmin-ERS]	Ongoing
Poultry(100)	Kavery poultry in backyard farming system	Ongoing
Cattle/buffalo(50)	Popularization ICAR NIANP Feed Chart App	Ongoing
Fisheries(10)	Genetically Improved Rohu (*Labeo rohita*)	Ongoing
Fisheries(10)	ICAR CIFRI Cage grower (Floating feed)	Ongoing

Front line demonstration conducted by KVKs

3. Demonstrations Units and Farm Input Production

KVKs maintain several demonstration units to provide practical, hands-on learning opportunities for farmers. In addition to the KVK Experimental Farm and the Integrated Farming System (IFS) Model, demonstration units such as Vermicompost Preparation, Mushroom Cultivation, Poultry, Duckery, Goatery, and Apiary are also being effectively maintained. Moreover, Jute-based, Sisal-based, and Ramie-based Integrated Farming System —are operational at the KVK to highlight the role of fibre-oriented IFS in enhancing farmers' production and income. Regular exposure visits are organized for trainees to facilitate large-scale dissemination of these technologies.

KVK, Burdwan

Name of demonstration unit	Variety	Quantity at present	Product	Quantity
Vermicompost	*Eisenia fetida*	5,000 worms, 21.53 qt. vermicompost	Paddy (foundation seed of MTU 7029, MTU 1153)	9450 kg
Mushroom	Oyster	35 mushroom beds	Fruit sapling (Mango, Citrus, Guava, Dragon fruit)	1523 pc
Poultry	RIR	20 nos.	Horticulture crops production	671 kg
Duckery	Chara Chameli	15 nos.	Vermicompost	2153 kg
Goatary	Black Bengal	04 nos.	Poultry Meat	22.20 kg
Apiary	*Apis mellifera*	04 beehives		

KVK, North 24 Parganas (Additional)

Name of demonstration unit	Variety	Quantity at present	Product	Quantity
New Age Fibre (Ramie)	Hazarika	0.25 ha	Paddy (Certified seed production) – var. MTU 1156 & MTU 1153	8000 Kg
New Age Fibre (Roselle for calyx)	DRR & HSLC-1	0.2 ha	Mustard seed (var. PM 28)	100 Kg
New Age Fibre (Sisal+Rajnigandha		0.2 ha	Sunhemp seed (var. SUIN 03)	150 Kg
Duckery unit	White Peckin	100 nos.	Vegetable seedlings	8000 nos.
Goatary	Black Bengal	12 nos.	Fruit saplings (Mango, Guava and Dragon Fruit)	500 no.
Cow	Desi	02 nos.	Fruits and Vegetable production	523 kg
Progeny Orchard	Mango, Guava, Jackfruit,	0.5 ha	Coconut	1000 nos.
Fruit Orchard	Lemon, Mango, Sapota , Guava & Lemon	2.0 ha	Duck Egg	630 nos.
Dragon fruit	Red type	0.05 ha		
IFS unit (Fish pond)	Fish polyculture	0.35 ha		

4. Trainings organised by KVKs

Training is a vital component of Krishi Vigyan Kendras (KVKs) as it helps transfer scientific knowledge and modern agricultural technologies directly to farmers. Altogether seventy eight trainings were conducted by KVKs of ICAR CRIJAF during the year 2025 benefiting 1773 farmers, Rural youth and Farm women. Through hands-on learning, farmers, rural youth, and women gain skills that improve productivity, reduce costs, and promote sustainable farming practices. KVK training also builds confidence, encourages innovation, and increases awareness of government schemes, ultimately enhancing livelihoods and strengthening rural development.

Training and other extension activities by KVKs

AINP on Jute and Allied Fibres

All India Network Project on Jute and Allied Fibres functions through 8 SAUs and 4 ICAR institute-based centres with its Head Quarter at ICAR-CRIJAF, Barrackpore. During the year 2025 a total of 66 (crop improvement 30, crop production 16 and crop protection 20) projects were evaluated on jute *Corchorus capsularis* and *C. olitorius*), mesta (*Hibiscus sabdariffa* and *H. cannabinus*), ramie (*Boehmeria nivea*), sisa (*Agave* sp.) and flax (*Linum usitatissimum*) pertaining to crop improvement, crop production and crop protection aspects.

Crop Improvement

A total of 30 projects comprising of 145 trials were evaluated at different centres under crop improvement programme. Sixteen projects were evaluated for jute, eleven for mesta, two for flax and one in ramie, including germplasm evaluation, national hybridization programme, initial evaluation trials, advance varietal trial-I, advance varietal trials-II and adaptive trials on jute and allied fibre crops.

Release and notification of HS Mesta (Roselle) variety for commercial cultivation

AMV 11: An HS Mesta (roselle) variety developed by ARS, Amadalavalasa centre of AINPJAF had been released and notified vide the Gazette of India Notification No. S.O. 2128 (E), dated 13.05.2025 for commercial cultivation in mesta growing states of the country. AMV 11 is a red pigmented mesta variety with average fibre yield of 29.09 q/ha and potential yield 39.68 q/ha with less bristles and better fibre quality in terms of root content, defects and fibre strength. It is tolerant to foot and stem rot disease and insects like aphids and white flies. It is suitable for rainfed mesta growing belt of India for cultivation from Mid-May to mid-June sowing in West Bengal, Odisha, Maharashtra, Andhra Pradesh, Bihar and NEH regions. Its fibre quality is better in terms of root contents and comparable fibre fineness and strength with check varieties.

Tossa jute variety identified for central release

One variety of tossa jute (JRO-2024) had been identified for central release during the 36th Annual Workshop of AINPJAF held at ICAR-CRIJAF, Barrackpore on 17th March 2025. The salient feature of this variety is summarised below:

JRO-2024: This is a green stem tossa jute variety suitable for early sowing owing to its resistance to pre-mature flowering. It has 31.81 q/ha average fibre yield in coordinated trials with potential fibre yield of 37.40 q/ha. Variety JRO-2024 is suitable for cultivation in West Bengal, Assam, Bihar, Maharashtra and Odisha in both rainfed / irrigated ecosystems for early-march to April sowing. It is tolerant to root and stem rot disease and insects like, yellow mites and semilooper. Fibre quality is also at par with popular commercial varieties of tossa jute.

Screening of JAF germplasm for yield, quality, biotic stresses and special traits

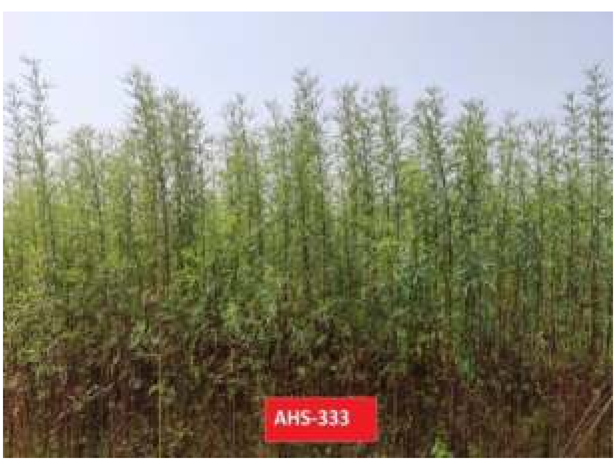
Under this project, trials were conducted in following sub-projects at various locations as per the details given below:

NP (JB) 1.14: Evaluation of *capsularis* jute germplasm at Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara, and Nagaon centres.

NP (JB) 1.15: Evaluation of *olitorius* jute germplasm at Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara, Nagaon and Rahuri centres.

NP(MB) 1.14: Evaluation of roselle germplasm at Amadalavalasa, Katihar, Aduthurai, Rahuri and Barrackpore centres.

NP (MB) 1.15: Evaluation of kenaf germplasm at Aduthurai, Amadalavalasa, Rahuri, Katihar and Barrackpore centres.



Multi-location evaluation of elite lines with improved fibre yield, quality and resistance to diseases and pests

NP (JB) 2.10: NHP with *olitorius* jute-Evaluation of F_6 progenies at Coochbehar, Kalyani and Rahuri centres.

NP(JB) 2.11: NHP with *capsularis* jute- Evaluation of F_6 progenies at Coochbehar, Kalyani and Nagaon centres.

NP (JB) 2.12: NHP with *olitorius* jute- Evaluation of F_5 progenies at Coochbehar, Kalyani, Nagaon and Rahuri centres.

NP (JB) 2.13: NHP with *olitorius* jute-Pre-breeding for pest and disease resistance-Evaluation of F_4 progenies at Coochbehar, Kalyani, Katihar, Kendrapara, Rahuri and Nagaon centres.

NP (JB) 2.14: NHP with *olitorius* jute-Pre-breeding for fibre fineness-Evaluation of F_4 progenies at Coochbehar, Kalyani, Katihar, Kendrapara, Rahuri and Nagaon centres.

NP (JB) 2.15: NHP with *capsularis* jute-Pre-breeding for fibre strength-Evaluation of F_4 progenies at Coochbehar, Kalyani, Katihar, Nagaon and centres.

NP(JB) 2.16: NHP with *olitorius* jute-Crossing promising *olitorius* jute germplasms at Nagaon, Coochbehar, Kalyani, Katihar and Kendrapara centres.

NP (JB) 2.17 NHP with *capsularis* jute-Crossing promising *capsularis* jute germplasm at Nagaon, Coochbehar, Kalyani, Katihar and Kendrapara centres

NP (MB) 2.4: NHP with mesta-Evaluation of F_5 progenies of roselle at Barrackpore centre at Barrackpore centre.

NP (MB) 2.5: NHP with mesta-Breeding for YVMV resistance in kenaf-Evaluation of F_4 progenies at Aduthurai, Amadalavalasa and Rahuri centres.

NP (MB) 2.6: NHP with mesta-Pre-breeding for foot and stem rot resistance-Evaluation of F_4 progenies at Amadalavalasa, Aduthurai and Rahuri centres.

NP (MB) 2.7: NHP with HC Mesta (*H. cannabinus*)-Crossing promising kenaf germplasm at Amadalavalasa, Aduthurai, Barrackpore and Rahuri centres.

NP (MB) 2.8: NHP with HS Mesta (*H. sabdariffa*)-Crossing promising roselle germplasm at Aduthurai, Amadalavalasa, Barrackpore and Katihar centres.

Multi-location evaluation of elite lines with improved fibre yield, quality and resistance to diseases and pests

NP (JB) 5.74: IVT with tossa jute (*C. olitorius*) at Coochbehar, Kalyani, Katihar, Kendrapara, Rahuri and Nagaon centres.

NP (JB) 5.75: AVT-I with tossa jute (*C. olitorius*) at Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara, Nagaon and Rahuri centres.

NP (JB) 5.76: IVT with white jute (*C. capsularis*) at Coochbehar, Kalyani, Katihar, Kendrapara and Nagaon centres.

NP (JB) 5.77: AVT-I with white jute (*C. capsularis*) at Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara and Nagaon centres.

NP (CB) 1.63: IVT with kenaf (*H. cannabinus*) at Aduthuai, Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Rahuri centres.

NP (CB) 1.64: AVT-I with kenaf (*H. cannabinus*) at Aduthuai, Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Rahuri centres.

NP (CB) 1.65: AVT-II with kenaf (*H. cannabinus*) at Aduthuai, Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Rahuri centres.

NP (SB) 12.92: IVT with roselle (*H. sabdariffa)* at Aduthuai, Amadalavalasa, Coochbehar, Katihar, Kendrapara and Rahuri centres.

NP (FB) 1.26: IVT with fibre flax (*L. usitassimum*) at Barrackpore, Budbud, Pratapgarh and Katihar centres.

NP (FB) 1.27 (Repeat): AVT-I with flax (*L. usitassimum*) at Barrackpore, Budbud, Pratapgarh and Katihar centres.

NP (RB) 1.13: IVT with ramie (*B. nivea*) at Sorbhog, Coochbehar and Nagaon

Multi-location evaluation of elite JAF lines for specific traits

NP (JB) 3.12: AVT-II with white jute for late sown conditions at Kalyani, Katihar, Kendrapara, Coochbehar, Nagaon and Rahuri centres.

NP (JB) 3.13: Extreme-Premature flowering resistance in tossa jute at Barrackpore, Kalyani, Coochbehar, Katihar, Kendrapara and Nagaon centres.

Crop Production

Under crop production programme 16 projects comprising of 56 trials were conducted at different

centres. Out of 16 projects, nine projects were evaluated for jute, three for mesta, two for sisal and one project each for flax and ramie comprising of fertilizer scheduling, nutrient management, intercropping, cropping systems and yield maximization in jute and allied fibre crops. The trials conducted under various projects are summarized below:

NP(JA) 6.10: Performance of new jute genotypes under adaptive trials at different fertilizer schedules in *C. olitorius* jute at Kalyani, Coochbehar, Nagaon, Katihar and Kendrapara centres.

NP (JA) 6.19 (title modified in 2021): Soil test based fertilizer application in jute / mesta based cropping system for improved nutrient management

a) Neutral soil condition: Jute : Katihar, Bihar (rainfed); Mesta: Aduthurai, Tamil Nadu (irrigated)

b) Acid soil condition: Jute: Nagaon & Coochbehar; Mesta : Amadalavalasa

NP(JA) 7.15 (modified on 2018): Carbon dynamics and fertility status of the soils in jute and mesta growing areas

a) Hydro-physical characterization: Jute: Kalyani, Coochbehar, Katihar, Kendrapara & Nagaon

Mesta: Aduthurai, Amadalavalasa & Rahuri

NP(JA) 7.10 (title modified in 2021, 2025): Integrated weed management in jute and mesta

Locations: Jute: Kalyani, Coochbehar, Kendrapara, Katihar, Nagaon

Mesta: Amadalavalasa, Aduthurai, Rahuri

NP(JA) 7.18: Integrated nutrient management in seed production of *tossa* jute (*C. olitorius*) at Rahuri

NP(JA) 7.19: Conservation agricultural practice under jute-rice-lentil cropping system at Barrackpore, Kalyani, Coochbehar, Katihar and Kendrapara centres.

NP(JA) 7.20: Evaluation of economic performance of jute/mesta-green gram/black gram intercropping systems for jute at Barrackpore, Kalyani, Kendrapara, Katihar, Nagaon and for Mesta at Amadalavalasa and Aduthurai centres

NP(FLA) 1.6: Performance of different jute based cropping systems for enhanced productivity and profitability at Barrackpore, CoochBehar, Nagaon, Katihar and Kalyani centres.

NP(RA) 2.4: Yield maximization in ramie through improved management practices at Barrackpore Sorbhog and Coochbehar centres.

NP(SIA) 5.2: Nutrient management in sisal at Amadalavalasa centre.

NP(SIA) 5.3 (title modified in 2021): Development of sisal based intercropping system for higher productivity and profitability along with improved resource use

a) Inter-cropping of aromatic grasses in sisal plantation for enhancing farm productivity (title modified in 2025) at Amadalavalasa centre.

b) Inter-cropping of spices and medicinal plants in sisal plantation for higher farm income at Amadalavalasa, and Bamra centres.

NP(FLA) 1.5: Development of flax based intercropping system for higher productivity and profitability at Barrackpore, Kalyani, CoochBehar, Nagaon and Katihar centres

Crop Protection

Under crop protection programme a sum of 20 projects comprising of 78 trials were conducted at different centres. Out of 20 projects, ten projects were evaluated for jute, eight for mesta and two for fibre flax comprising of survey and surveillance of pests and diseases, screening of germplasm for pests and diseases, integrated pests and disease management and evaluation of pesticides against pests and diseases of jute and allied fibre crops.The trials conducted under various projects are summarized below:

NP (JMPE)1.1: Survey and surveillance of pests and diseases of jute and mesta at Amadalavalasa, Barrackpore, Coochbehar, Katihar, Kendrapara, Nagaon centres.

NP (JB) 1.14: Evaluation of *capsularis* jute germplasm against pests and diseases at Coochbehar, Katihar, Kendrapara and Nagaon centres.

NP (JB) 1.15: Evaluation of *olitorius* jute germplasm against pests and diseases at Coochbehar, Katihar, Kendrapara and Nagaon centres.

NP(MB) 1.14: Evaluation of roselle germplasm against pests and diseases at Amadalavalasa centre.

NP (MB) 1.15: Evaluation of kenaf germplasm against pests and diseases at Amadalavalasa, Coochbehar, Katihar and Kendrapara centres.

NP (JP) 2.8: Intensive screening of tossa jute accessions against stem rot disease at Barrackpore, Coochbehar, Katihar, Kendrapara and Nagaon centres

NP (JP) 2.9: Intensive screening of white jute accessions against stem rot disease at Barrackpore, Coochbehar, Katihar, Kendrapara and Nagaon centres.

ST (JE) 2.10: Evaluation of elite *C. olitorius* jute genotypes against nematode infestation under pot conditions at Coochbehar centre.

NP (JE) 6.9: Management of root-knot nematode (*Meloidogyne*spp) in jute at Coochbehar, Kendrapara, Nagaon centres

NP (JB) 5.75: AVT-I with tossa jute (*C. olitorius*) at Barrackpore, Coochbehar, Katihar, Kendrapara and Nagaon centres.

NP (JB) 5.77: AVT-I with white jute (*C. capsularis*) at Barrackpore, Coochbehar, Katihar, Kendrapara and Nagaon centres.

NP (JP) 1.2: Developing jute disease map based on intensive survey of jute and mesta diseases at Amadalavalasa, Barrackpore, Coochbehar, Katihar, Kendrapara and Nagaon centres.

NP (JP) 2.2.: Screening of fungicides against *Macrophomina phaseolina* at Barrackpore and Coochbehar centres.

ST(ME):4.8.: Management of spiral borer in mesta at Amadalavalasa centre.

NP (CB) 1.63: IVT with kenaf (*H. cannabinus*) at Amadalavalasa, Barrackpore, Coochbehar, Katihar and Kendrapara centres.

NP (CB) 1.64: AVT-I with kenaf (*H. cannabinus*) at Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Katihar centres.

NP (CB) 1.65: AVT-II with kenaf (*H. cannabinus*) at Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Katihar centres.

NP (SB) 12. 92: IVT with roselle (*H. sabdariffa*) at Amadalavalasa centre.

NP (FB) 1.26: IVT with fibre flax (*L. usitassimum*) at Barrackpore centres.

NP (FB) 1.27 (Repeat): AVT-I with flax (*L. usitassimum*) at Barrackpore and Katihar centres.

IPR Protection and Commercialization

1.Registration/ IPR Protection

The details of the plant variety registration and IPR protection of the technologies are as follows:

IPRs	Application/ Registration No.	Name of Innovation/ Technology/ Product/ Plant Variety	Date of application Filed/ submitted	Date of Application Granted/ Registered**
Plant Variety	REG/2021/0010	Tossa Jute Variety (JROB-2)	05.12.2024	Registered by PPVFRA for initial 6 years
	REG/2021/0010	White Jute Variety (JRCJ-11)	17.10.2024	Registered by PPVFRA for initial 6 years
Copyrights	SW-30353/2025-CO	1. ILP-Miner: A GUI-Based computer software for Intron Length Polymorphism Marker Design	30.07.2025	Form XIV, Draft statement of particulars, Draft statement of further particulars and Power of attorney have been submitted to Copyright Office, New Delhi.
	LD-33723/2025-CO	2. Jute ILP Marker Database: A Web-Based Searchable Repository of Intron Length Polymorphism Markers in Jute	21.08.2025	
	LD-33778/2025-CO	3. Jute (*Corchorus capsularis*) Germplasm Database	22.08.2025	
Design	455604-001	1. Improved Jute Ribboner	16.04.2025	Examination Report has been Generated ,Online Reply Document Received(FER generated on 09/07/2025)
	455559-001	2. Flax Scutching Machine	16.04.2025	Examination Report has been Generated ,Online Reply Document Received(FER generated on 01/07/2025)

2. Commercialization & Royalty Earned

2.1. Commercialization

ICAR-CRIJAF developed 01 Jute variety and 04 technologies/products were commercialized during this period reported upon. The details are as follows:

No.	Name of the technology/variety	Name of the Licensee(s)	Mode of Partnership	Date of Licensing
1.	Ramie & Sisal Fibre Extractor	M/s. Creative Displayers, W.B	Institutional MoA	13.12.2024
2.	Jute Seeder	M/s. Bengal Biotech and Research, W.B	MoA signed via mediation of Agrinnovate Pvt. Ltd., New Delhi	02.01.2025
		M/s Next 2 Nature, Assam		02.01.2025
3.	Flax Fibre Extractor	M/s. Joy Maa Tara Enterprise, W.B	Institutional MoA	22.08.2025
4.	CRIJAF Jute variety (JROBA-3)	M/s. Balaji Seeds Crop Sciences Pvt. Ltd., Telangana	Institutional MoA	21.04.2025
		M/s. Invicta Agritech India Pvt. Ltd., Telangana		22.05.2025
		M/s. Sri Krishna Seeds Andhra Pradesh		10.09.2025

2.2. Royalty earned

A total amount of Rs 1,05,51,805/- has been received as licensing fees and royalty payment of various commercialized technologies (CRIJAF seeds, CRIJAF SONA, CRIJAF Multi Row Seed Drill, CRIJAF Nail Weeder, CRIJAF Single Wheel Jute Weeder, CRIJAF flax fibre extractor, Ramie and sisal fibre extractor and CRIJAF Jute Seeder) from authorized manufacturer and sellers during this period reported upon.

Farmer's Outreach

Scientists & Farmers Linkages

Advanced Retting Technology for the Production of Quality Jute Fibre

The institute organized the training-cum-field demonstration programme from 5 to 7 August 2025 for Scheduled Caste farmers of North 24 Parganas and Nadia districts under the SCSP. During the programme, a total of 150 farmers from Barasat-I and Hingalganj blocks of North 24 Parganas and Ranaghat block of Nadia district were trained on various aspects of advanced jute retting technologies. Special emphasis was laid on the importance of CRIJAF Sona for improved jute retting, its detailed procedure, the drawbacks of traditional retting practices, and grading of fibre quality to obtain better prices in the market. CRIJAF Sona powder was also provided to farmers for adopting advanced retting technology.The farmers were highly enthusiastic about the training and demonstrations. Following a participatory approach, field demonstrations of advanced jute retting technology were conducted in ponds located near the villages.

Basic Skill Development in Making Jute Bouquets and Handicrafts

A ten-day training programme on *"Basic Skill Development in Making Jute Bouquets and Handicrafts"* was organized at ICAR–CRIJAF, Barrackpore, Kolkata during 9–18 June 2025, under the Scheduled Caste Sub-Plan (SCSP) Hands-on experience was provided to the trainees in making various types of jute handicrafts, enabling them to become technically empowered and contribute to their family income through production and marketing of these products. At the valedictory-cum-certificate distribution ceremony, the Chief Guest, Dr. Tirtha Kumar Datta, Vice Chancellor, West Bengal University of Animal and Fishery Sciences, Kolkata, appreciated such training programmes organized by ICAR–CRIJAF and highlighted their importance in creating sustainable livelihood options through skill development in producing diversified value-added jute products. The trainees also shared their experiences and expressed keen interest in participating in similar advanced trainings in the future.

Farmers–Experts Experience Sharing Programme under the Viksit Krishi Sankalp Abhiyan.

The Farmers–Experts Experience Sharing Programme under the Viksit Krishi Sankalp Abhiyan was organized at ICAR–CRIJAF, Barrackpore, Kolkata on 25 June 2025 to facilitate sharing of experiences between farmers and experts regarding the campaign under the chairmanship of Dr. Gouranga Kar, Director, ICAR–CRIJAF, with participation of of around 55 farmers and 50 experts.During the programme, scientists shared their interactions, discussions and experiences with farmers during the campaign and explained how the initiative provided them an opportunity to understand farmers and their problems more closely. Dr. Gouranga Kar also shared his personal experiences highlighting that during the 15-day campaign, 17 teams covered four districts—Cooch Behar, Bankura, Burdwan, and North 24 Parganas, interacting with nearly 1,54,000 farmers across 1,154 villages. Farmers were informed about scientific cultivation practices for Kharif crops and various Government of India schemes.

Advanced Skill Development Training Programme on Jute Handicrafts

ICAR–CRIJAF successfully concluded the Advanced Skill Development Training Programme on Jute Handicrafts, organized under the SCSP initiative from 29 October to 11 November 2025. During the valedictory session, participants received their certificates in recognition of their commitment, creativity and successful completion of the training. The programme aimed to empower rural artisans with enhanced skills in crafting value-added jute-based products, promoting livelihood opportunities and entrepreneurship. ICAR-CRIJAF extends heartfelt congratulations to all participants and appreciation to the trainers and staff who made this programme a success, empowering communities through skill, creativity, and jute innovation.

Farm Women Conclave

ICAR-Central Research Institute for Jute and Allied Fibres (CRIJAF) successfully organized a Farm Women Conclave on October 9, 2025, at its campus, where officials interacted with Self-Help Groups (SHGs) who had previously received training from the Institute on bag making and the production of jute diversified products. The Institute is continuously dedicated to the socio-economic and technological empowerment of farm women through ongoing specialized training and the promotion of livelihood opportunities based on the diversification and value addition of jute products.

Basic Skill Development Training on Making of Jute Flower Vase

Empowering Women on Jute Craft through Basic Skill Development Training on Making of Jute Flower Vases program, held from September 18th to 24th, 2025 at ICAR -CRIJAF, was a resounding success, equipping a dedicated group of women with the skills to create beautiful and marketable products from jute, a sustainable fiber. The participants' enthusiasm and craftsmanship were truly impressive, as seen in the finished jute vases they crafted during the course.The program concluded on a high note with a certificate-awarding ceremony. Director, Dr. Gouranga Kar, graciously presented certificates to all the successful participants, acknowledging their hard work and dedication.This initiative is a testament to our commitment to rural development and empowering communities through new livelihood opportunities in jute diversification.We are proud to see these women embark on a new journey as skilled artisans. Congratulations to all the participants!

Advanced Skill Development Training Programme on Jute Handicrafts

Farm Women Conclave

SCSP, TSP and NEH Programs

The Scheduled Caste Sub-Plan (SCSP) , Scheduled Tribe component –Tribal Sub Plan (STC –TSP) and North Eastern Hill (NEH) Programs were implemented by ICAR-CRIJAF to reduce regional and social disparities by providing direct support to marginalized groups. Their overall objective is inclusive growth through improved access to resources, capacity building, and sustainable livelihood opportunities.

Scheduled Caste Sub-Plan (SCSP)

The Scheduled Caste Sub-Plan (SCSP) programme implemented by ICAR–CRIJAF is designed to address the socio-economic challenges and developmental needs of Scheduled Caste (SC) farming communities in West Bengal. By focusing on jute and allied fibre–based farming systems, the programme aimed to bridge the livelihood gap between SC and general communities through integrated, technology-driven agricultural interventions. The initiative was carried out across several districts including North 24 Parganas, South 24 Parganas, Nadia, Bankura, Purulia and Purba Bardhaman, where a significant proportion of the population relies on agriculture for income and sustenance.

To strengthen the knowledge base and skills of SC farmers, ICAR–CRIJAF conducted a series of capacity-building activities during 2025. Through these programmes, 785 SC farmers were exposed to improved agricultural practices, scientific methods of cultivation, and opportunities to interact with researchers and industry stakeholders. These efforts played an important role in empowering farmers to adopt better farm management techniques and enhance productivity.

Complementing the training and demonstrations, the SCSP initiative also ensured the distribution of essential agricultural inputs and farm technologies to support on-ground adoption. Improved varieties of jute, paddy and vegetables, fertilizers, vermicompost beds, CRIJAF SONA, solar light traps, and farm implements such as CRIJAF single-wheel weeders, jute seeders and battery-operated sprayers were provided to more than 12,000 SC farmers across the project districts. This extensive resource support enabled wider use of modern tools and improved farming systems, contributing to increased farm income, reduced production constraints, and greater livelihood security among SC farming households.

Capacity Building Programmes

Sl.No	Capacity building programme	Duration (days)	No. of Participants
1.	Training on "Entrepreneurship Development in Fisheries & Aquaculture" at ICAR CRIJAF, Barrackpore from 02-08 Jan 2025	7	15
2.	Advanced Skill Development Training Programme on Making of Jute Bags for Rural Women of Sundarban" from 31 Jan to 14 Feb 2025 at Kultali Milon Tirtha Society, Sundarban, South 24 Parganas	15	30
3.	Training on "Skill development in Designing & Making of Jute fibre based Bags" at ICAR-CRIJAF, Barrackpore from Feb 17-28, 2025	12	20
4.	Basic Skill Development Training on "Making of Jute Bouquet & Handicrafts" at ICAR-CRIJAF, Barrackpore from June 9-18, 2025	10	15
5.	Basic Skill Development Training on "Making of Jute Flower Bouquet" at ICAR-CRIJAF, Barrackpore from July 16-25, 2025	10	15
6.	Basic Skill Development Training Programme on "Making of Jute Handicrafts" at ICAR-CRIJAF, Barrackpore Aug 20-29, 2025	10	15

Sl.No	Capacity building programme	Duration (days)	No. of Participants
7.	Advanced Skill Development Training on "Making of Jute Handicrafts" at ICAR-CRIJAF, Barrackpore from 29 Oct to 11 October 2025	12	15
8.	Awareness-cum-Input Distribution Programme on "Backyard poultry rearing and management practices" on 12th Feb 2025 at Barasat-1, North 24 Parganas	1	100
9.	Training-cum-Field Demonstration on "Improved Retting Technology for Quality Jute Fibre Production" on 5th Aug 2025 at Barasat-1, North 24 Parganas	1	50
10.	Training-cum-Field Demonstration on "Improved Retting Technology for Quality Jute Fibre Production" on 6th Aug 2025 at Ranaghat, Nadia	1	50
11.	Training-cum-Field Demonstration on "Improved Retting Technology for Quality Jute Fibre Production" on 7th Aug 2025, Hingalganj, North 24 Parganas	1	50
12.	Awareness-cum-Input Distribution Programme on "poultry–fish–horticulture-based integrated farming systems"on 12th Aug 2025 at Sandeshkhali, North 24 Parganas	1	50






Demonstration and trainings under SCSP 2025

Other events Organized

Jute Industries –Stakeholder Meet

The Jute Industries- Stakeholders Meet was organized on 02 January, 2025 at ICAR-CRIJAF under the Chairmanship of Sri Giriraj Singh ji, Hon'ble Union Minister of Textiles, Govt. of India with the objective to unveil a roadmap aimed at upscaling the cultivation and utilization of jute and allied fibres. The plan outlined strategies for increasing the area under cultivation, improving agronomic practices and promoting the adoption of advanced processing technologies.

Field Day-cum-Farmer-Industry-Scientist Interaction Programme

ICAR-CRIJAF, Barrackpore organized a Field Day-cum-Farmer-Industry-Scientist Interaction Programme on September 05, 2025 under the SCSP to showcase institute-developed technologies and promote their adoption. The event brought together 160 participants, including farmers, SHG/FPO members, industry partners, scientists, and technical staff, offering them an opportunity to observe technologies in the field and engage with experts. Shri Giriraj Singh, Hon'ble Minister of Textiles, Government of India, inaugurated the programme and highlighted the potential of new-age fibres as alternative livelihood options, emphasizing their role in enhancing resilience and income in diverse and risk-prone agricultural conditions.

Farm Women Conclave

ICAR-CRIJAF, Barrackpore organized a "Farm women conclave" on October 9, 2025 under SCSP, which was attended by around 200 women farmers and self-help group members from different districts. The event aimed to provide hands-on exposure in making various jute handicrafts, helping farm women enhance their technical skills and generate additional income through value-added products. Dr. Tapas Biswas, Senior Research Scientist and Advisor, CSIRO, Australia, graced the event as the chief guest and Dr. Shyamal Samant, IPS, DC, HQ, Howrah, West Bengal attended as the guest of honour. During the programme, self-help group members also shared their experiences and success stories with the dignitaries

Scheduled Tribe Component- Tribal Sub Plan (STC-TSP)

A series of activities were undertaken under Institute STC-TSP Programmeme for overall development of schedule tribe (ST) farming communities in identified villages of Nadia and North 24 Paraganas disticts of West Bengal during the year 2025 through integrated approaches in jute and allied fibres based cropping/ farming systems with various components like nutritional garden, field crop cultivations, vegetables and fruit plantations, fisheries, backyard poultry,vermicomposting, etc. with adequate resource support, successful technology models, farm implements, improved seeds, animal components, fish and poultry feed along with other appliances for improving household food security, farm income and additional employment opportunities under jute and allied fibre based cropping system.

To promote a jute-based farming system, various enterprises, such as vegetable cultivation, fishery, vermicomposting, organic farming etc., along with technological support, were provided to approximately **1500** ST farmers in West Bengal. Farm inputs (seeds, fertilizers, CRIJAF SONA, fish feed) and farm tools (sprayer, jute seeder, jute weeder, etc.) were given to all participating farmers.

Activities under STC-TSP 2025

Table: Inputs distribution

Inputs	Quantity
Seeds (Field Crops viz., jute, rice, mustard, etc.)	17.0 ton
Fruit saplings	2250 Nos
Small equipment's (uptoRs 2000)	1037 nos.
CRIJAF SONA –Microbial formulation for retting	200 Kg
Fish Fingerlings	700
Fish feed	2660 Kg
Lime	300 Kg
Black Bengal Goat	40 No.s
Goat feed	1000Kg
Mineral mixture	30 Kg
Chicks	2500 No.s
Ducklings	2000 No.s
Chick/duck feed	5500 Kg
Vegetable Seeds Kit	400 No.s

To develop knowledge and skill of ST farmers by identifying and addressing the issues related to low farm income in the field of agriculture and allied sectors, scientists of ICAR-CRIAF has conducted various capacity building programme like awareness camp, animal health camp, world soil day, trainings and demonstrations. During 2025, ten numbers of training programme were conducted which benefitted about 440 ST farmers.

Capacity building programme under STC-TSP Programme

Sl.No.	Title of Training	No. of days	No. of participants
1.	Awareness camp-cum-critical input distribution for tribal farmers under TSP program at ICAR CRIJAF on 24th and 25th of March 2025	2	300
2.	Basic Skill Development Training on Making of Jute Certificate Holder and Bouquets at ICAR CRIJAF from 23rd June to 2nd July 2025	10	15
3.	Making of jute certificate holder at ICAR CRIJAF from 16 to 25 July 2025	10	15
4.	Basic skill training on making of jute bags at ICAR CRIJAF from 18-27 Aug 2025	7	15
5.	Training on integrated fish farming systems at KVK North 24 Parganas, (Additional) from 26-28 Aug 2025	3	15
6.	Scientific nursery raising techniques in winter vegetables at KVK North 24 Parganas, (Additional) from 8-10 Sept 2025	3	15
7.	Basic Skill Development Training on Making of Flower Vase" from 18-24 Sept 2025	7	15
8.	Basic Capacity Building on Making of Jute Handicrafts and Bouquets at ICAR CRIJAF from from 8-17 Sept 2025	10	20
9.	Value addition of important fruit crops at KVK North 24 Parganas, (Additional) from 23-25 Sept 2025	3	15
10.	Awareness-cum-Input Distribution Programme 0n 29Oct 2025 at Bilany, Hingalgunj, North 24 Parganas	1	15

Event organised

Janjatiya Gaurav Varsh Pakhwada -2025

The "Janjatiya Gaurav Varsh Pakhwada 2025," organized to commemorate the 150th Birth Anniversary of Bhagwan Birsa Munda, was observed from 1–15 November 2025 across several tribal villages in North 24 Parganas and Hooghly districts. Altogether around 450 tribal farmers participated in the awareness programs. The fortnight-long programme focused on diverse themes aimed at empowering Scheduled Tribe communities through awareness, education, livelihood development, and cultural preservation. Activities also stressed public awareness, entrepreneurship summits, establishing tribal farmers' markets, and setting up community-based seed banks to preserve indigenous crop varieties. The enthusiastic participation of tribal farmers across all locations made the programme highly impactful. The Pakhwada successfully reinforced the mission of tribal empowerment, self-reliance, and holistic rural development.

NER/ NEH activities of ICAR-CRIJAF in 2025

ICAR–CRIJAF implemented a range of developmental activities under the NER/NEH budget to strengthen agricultural practices across the north-eastern states. The programmes promoted vermicomposting, improved jute cultivation, scientific livestock and poultry rearing, and better retting practices, thereby enhancing farmers' technical knowledge and resource availability.

Farmers in Meghalaya benefited from vermicomposting inputs that aligned with their traditional organic farming practices, while those in Assam gained access to improved jute varieties and retting accelerators, enabling higher-quality fibre production. Livestock-based interventions in Nagaland and Arunachal Pradesh supported scientific pig and chick rearing, contributing to improved productivity and income prospects. Collaborative initiatives with KVK, West Garo Hills facilitated the distribution of essential agricultural implements and strengthened farmer–scientist interactions, helping address field-level issues. Promotion of improved arecanut cultivation in Assam further encouraged the adoption of scientific planting techniques. Overall, these interventions significantly enhanced farmers' capacity, boosted agricultural efficiency, and supported sustainable livelihood development in the region.

Capacity building program under NEH

Sl. No.	Subject of Training	Duration (Days)	No. of Participants
1.	Farmers' awareness programme on vermicomposting and distribution of inputs (vermibed and earthworm) on 20,21 and 22 Jan 2025 at Haripur; Dalu; Gambagre; West Garo Hills, Meghalaya	1	300
2.	Farmers' awareness programme on improved cultivation of jute and distribution of certified jute seed on 17, 18 and 24 March 2025 at Tedhara; Mandia; Sorbhog; Barpeta, Assam	1	300
3.	Farmers' awareness programme on scientific rearing of pigs and distribution of piglets & mineral mixture on 20 March 2025 at Medziphema;Nagaland	1	50
4.	Farmers' awareness programme on improved rearing of chicks and distribution of chicks, feed and mineral mixture on 21 March 2025 at West Siang; Arunachal Pradesh	1	100
5.	Farmers' awareness programme on improved retting of jute and distribution of CRIJAF Sona on 10, 11 and 12 July 2025 at Mandia; Sorbhog; Barpeta, Assam	1	300
6.	Farmers' awareness programme and distribution of agri-inputs (spade, bucket, watering can, irrigation pipe, sickle, khurpi) on 15,16 and 17 July 2025 at Shyamnagar; KVK, West Garo Hills; Kherapara	1	300
7.	Farmers' awareness programme on improved arecanut cultivation and distribution of arecanut saplings and vermicompost on 30 Aug 2025 at Barpeta Assam	1	100
8.	Farmers' awareness programme on vermicomposting and distribution of vermibed on 17th Nov 2025 at Sorbhog; Assam	1	100
9.	Farmers' awareness programme on vermicomposting and distribution of vermibed on 9 and 10 Dec 2025 at KVK, Tura, West Garo Hills, Meghalaya	1	150 150
		Total	1850



Activities under NEH-2025

Swachh Bharat Mission

Swachh Bharat Diwas was celebrated on 2^{nd} October 2025, organizing a wide array of engaging activities and programs in compliance with directives from the ICAR, and the Ministry of Jal Shakti and Ministry of Housing and Urban affairs. The institute prominently displayed banners with the theme "*Swachhotsav*" and held a solemn pledge-taking ceremony to reinforce the commitment to cleanliness. Creativity and awareness were fostered through a slogan writing competition for staff as well as drawing and quiz contests at nearby schools. ICAR-CRIJAF also conducted enlightening Swachhata Samvad programs for farmers, students and rural people for spreading the message of cleanliness at local schools and villages. Recognizing the invaluable contributions of *Safai Mitras* (sanitation workers), ICAR-CRIJAF's Swachhta Committee felicitated them with sanitation kits. A preventive health check-up camp was also arranged for the *Safai Mitras*, ensuring their well-being. Through these multifaceted initiatives, ICAR-CRIJAF, Barrackpore celebrated Swachh Bharat Diwas with great fervour, spreading awareness and inspiring action towards a cleaner and greener India.

Swachhta Pakhwada activities was also organised from December 17-31, 2025. Eye-catching banners were printed and prominently displayed to spread awareness. A solemn pledge taking ceremony reinforced the institute's commitment to cleanliness. Kisan Diwas (Farmer's Day) was also celebrated in the village Impactful awareness programs were conducted in nearby villages, educating farmer and farm women on optimal management of farm and household waste. Villagers learned improved vegetable cultivation methods to boost their incomes. The institute also took the opportunity to review and weed out old records, properly disposing of scrap items. Cleanliness drives were carried out across the institute campus, a local school, villages, and parks. An engaging quiz completion tested the knowledge of local school students. Through these multifaceted initiatives, ICAR-CRIJAF made meaningful strides in promoting the *Swachhta Hi Seva* mission.

Various activities of Swachh Bharat Mission programme conducted by ICAR-CRIJAF

Women Empowerment

Empowering and mainstreaming rural women in agriculture is essential for inclusive economic growth and sustainable livelihood security. Recognizing the pivotal role of women in jute-based farming systems, ICAR–Central Research Institute for Jute and Allied Fibres (ICAR-CRIJAF), Barrackpore implemented focused interventions during 2025 to reduce drudgery, enhance skills, and promote women-led entrepreneurship, aligned with the Lakhpati Didi Strategy.

Drudgery Reduction through Women-Friendly Farm Implements

To enhance women's participation in jute cultivation, ICAR-CRIJAF introduced and demonstrated women-friendly farm implements in TSP and SCSP adopted villages of North 24 Parganas and Nadia districts. Implements such as jute seed drills, nail weeders, single-row and single-wheel jute weeders, and knapsack sprayers were distributed among farm women. A key intervention was the demonstration of the Improved CRIJAF Multi-Row Seed Drill (MRSD), specially modified to be lighter and ergonomically suitable for women operators. The reduced weight and transparent, weather-resistant seed box encouraged adoption of line sowing in jute, leading to better crop establishment and easier intercultural operations. For weed management, single-wheel jute weeders and nail weeders were introduced through demonstration-cum-training programmes. These implements enabled mechanical weeding in a standing posture, reduced labour requirement, and improved working conditions, particularly during hot and humid periods.

Skill Development and Women Entrepreneurship under Lakhpati Didi Strategy

In line with the Lakhpati Didi Strategy, ICAR-CRIJAF promoted jute value addition and women entrepreneurship as sustainable livelihood options. Skill development programmes were organized on jute bag making, jute handicrafts, jute ornaments, under jute-based integrated farming systems to diversify income sources. Structured training and capacity-building programmes covering production techniques, product diversification and basic entrepreneurship were conducted. A total of 205 women of various Self-Help Groups (SHGs) were trained from Sundarban, Gobardanga, Beraberia and adjoining areas.

Women were encouraged to form and strengthen SHGs, which are actively engaged in jute value addition enterprises. Continuous handholding

support and convergence with TSP, SCSP, SHG federations, NGOs, NRLM and line departments facilitated enterprise sustainability, market linkage, and income enhancement. The integrated interventions of ICAR-CRIJAF successfully demonstrated that drudgery reduction, skill development, and jute-based entrepreneurship can transform rural women into economically empowered stakeholders. These initiatives significantly contribute to sustainable livelihoods and reinforce the vision of inclusive and resilient rural economic growth

Impact and Outcomes

- Two hundred and five rural women trained from SHGs across jute-growing and coastal regions
- Adoption of women-friendly farm implements resulting in reduced drudgery and improved efficiency
- Formation and strengthening of women-led jute enterprises
- Enhanced income opportunities through jute bag and handicraft production
- Improved financial independence, confidence, and decision-making capacity
- Strong potential for achieving ₹1 lakh or more annual household income, contributing to the creation of Lakhpati Didis

Viksit Krishi Sankalp Abhiyan (VKSA)-2025

The Viksit Krishi Sankalp Abhiyan (VKSA) launched by Union Minister for Agriculture & Farmers Welfare and Rural Development Shri Shivraj Singh Chouhan is a transformative initiative aimed at strengthening Indian agriculture by bridging the gap between research institutions and farming communities through the promotion of innovative practices. ICAR-CRIJAF successfully implemented VKSA from 29 May to 12 June 2025 across North 24 Parganas, Coochbehar, Purba Burdwan, and Bankura districts of West Bengal. The campaign focused on enhancing direct interaction between farmers and scientists from ICAR-CRIJAF and State Agricultural Universities (SAUs) to rapidly disseminate innovative technologies for the kharif season. Emphasizing innovation, inclusivity, and sustainability, the campaign aligned with the Sustainable Development Goals (SDGs).

A total of 17 multidisciplinary teams comprising scientists, KVK personnel, and progressive farmers conducted over 450 farmer-centric meetings covering modern agricultural technologies, soil health, natural farming, high-yielding crop varieties, crop diversification, government schemes, digital agriculture, drone applications, and farm mechanization. Location-specific solutions addressed challenges related to productivity, nutrient and pest management, organic farming, skill development of farm women, and farm profitability. Emphasis was also placed on precision farming, composting, and water management to reduce cultivation costs and ensure sustainable resource use. Through extensive outreach, ICAR-CRIJAF engaged 153,931 farmers across 1,157 villages, reflecting strong community participation in support of the vision of Viksit Bharat@2047. The introduction of the VKSA Rath, a mobile tableau showcasing modern technologies and government schemes, further enhanced awareness and adoption among farmers.

Participants were actively engaged in enriching discussions that fostered a collaborative learning environment, greatly benefiting the local farming community. The program not only enhanced farmers' skills but also encouraged the learning of innovative techniques, which may lead to improved agricultural productivity and enhanced rural livelihoods. The strong turnout highlights the significant potential for agricultural transformation in the area, with ICAR-CRIJAF at the forefront, empowering farmers through advanced research, modern practices, and sustainable solutions aimed at boosting productivity and overall well-being.

Director flagging on occasion of Viksit Krishi Sankalp Abhayan across Four districts of West Bengal

The Valedictory Programme of the Viksit Krishi Sankalp Abhiyan (VKSA) was held on 12th June 2025 at Hingalganj village, Hingalganj Block, North 24 Parganas district, West Bengal. The event began with a welcome address by Dr. Sanjoy Saha, Head, Crop Production Division and Coordinator, VKSA, ICAR-CRIJAF. This was followed by an address from Dr. Binoy Kumar Sheel, Director of Research, Extension and Farm, WBUAFS, Kolkata. Dr. Pradip Kumar Dey, Director, ICAR-ATARI, Kolkata, delivered his remarks as the Special Guest. The Chief Guest, Dr. Tirtha Kumar Dutta, Hon'ble Vice Chancellor, WBUAFS, Kolkata, also addressed the gathering. The Presidential Address was delivered by Dr. Gouranga Kar, Director, ICAR-CRIJAF, Kolkata. The programme concluded with a vote of thanks by Dr. Tanmay Samajdar, Senior Scientist and Head, KVK, North 24 Parganas (Additional). A well-designed Krishi Rath, showcasing various scientific agricultural technologies beneficial to farmers, visited nearby villages and interacted directly with the farming community.

Academic and Human Resource Development

Academic activities

ICAR-IARI, New Delhi, has recognized 16 different institutes of ICAR as IARI-Mega University Hubs. ICAR-CRIJAF is one of these hubs entrusted by IARI to initiate UG/PG/PhD teaching in agriculture. In this academic session, ICAR-CRIJAF is offering UG, PG in Genetics and Plant Breeding, Soil Science, Molecular Biology and Biotechnology, Agronomy and PhD program in Soil Science and Molecular Biology and Biotechnology. ICAR-CRIJAF, Kolkata hub has introduced these programs in association with 8 sister ICAR institutes, namely, ICAR-CIFRI, Barrackpore; ICAR-NINFET, Kolkata; ICAR-NBSSLUP, Kolkata Centre; ICAR-CSSRI, Canning Town Centre; ICAR-NDRI, Kalyani Centre; ICAR-IVRI, Kolkata; ICAR-CIFA, Rahara Centre; and ICAR-CIFE, Kolkata Centre, as hub partners. The academic programmes have been introduced for UG and PG students as per the 6th Dean Committee and BAMS respectively. Since the introduction of the academic programme at ICAR-CRIJAF, first batch of PG students have passed out in 2025 with impressive performance. Presently 35 UG students (16 admitted in 2023-24 and 19 admitted in 2024-25 session) are continuing B. Sc. (Hons.) Agriculture programme. During the 2024-25 academic session, following students successfully completed the academic requirements at IARI Kolkata Hub and were awarded M. Sc (Ag) degree by IARI, New Delhi.

Table- List of passed out PG students in 2025

Sl.	Name of student	Roll no.	Discipline
1	Lopamudra Samal	IARIKOL 20232001	Soil Science
2	Tamanash Das	IARIKOL 20232003	Soil Science
3	Devika. T. M.	IARIKOL 20232004	Soil Science
4	Sonu Kumar	IARIKOL 20232005	Genetics & Plant Breeding
5	Ashish Kumar	IARIKOL 20232006	Genetics & Plant Breeding

The PhD programmes for 2024-25 started at late and the following students enrolled for PhD programme at the IARI Kolkata hub.

Table- List of PhD students admitted in 2024-25 academic session

Table- List of PhD students admitted in 2024-25 academic session

Sl.	Name of student	Roll no.	Discipline
1	Sayantan Mandal	IARIKOL20241001	Soil Science
2	Sanjay Kumar Sheshma	IARIKOL20241002	Molecular Biology & Biotechnology
3	Kandinapally Praisy Sharon	IARIKOL20241004	Molecular Biology & Biotechnology
4	Anurodh Kamathker	IARIKOL20241005	Soil Science

Other activities and programmes organized for the students

The students usually participated in various activities of the institute. Besides the hub organized the Annual Sports event and farewell programme for the outgoing PG students.

Celebration of Teachers' Day- 2025

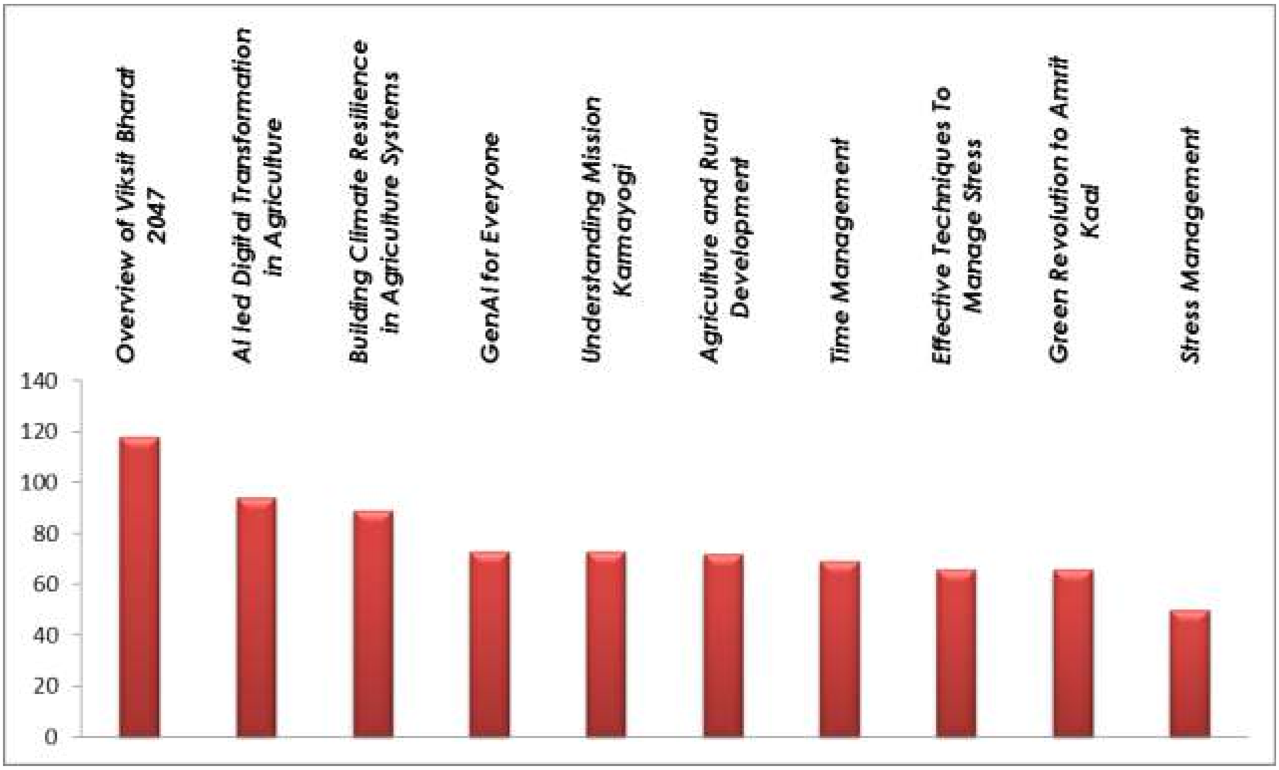
Farewel of Passout students at IARI Kolkata Hub

Students participated in Annual sports of IARI Kolkata hub

HRD activities

During 2025, a total of 154 employees of ICAR-CRIJAF completed training in the iGoT Karmayogi portal, receiving 1906 certificates. Of these, Group A employees completed 837 courses, Group B employees completed 538 courses while Group C employees successfully completed 531 courses. The employees registered for a total of 160 different topics. A total of 118 employees registered for the course 'Overview of Viksit Bharat 2047', while 94 employees were trained on 'AI led Digital Transformation in Agriculture. Other popular courses were 'Building Climate Resilience in Agriculture Systems', 'GenAI for Everyone', 'Understanding Mission Karmayogi', 'Agriculture and Rural Development' etc.

Top ten training courses attended by ICAR-CRIJAF employees in iGoT Karmayogi



Training/seminar attended by administrative and finance staffs during 2025

Name	Name of the Training/Seminar/Workshop	Place and date
Sri Sayan Basu, Assistant	Lecture session in training programmed for newly recruited assistants of ICAR	ICAR-CIFRI, Barrackpore on 17.02.2025-21.02.2025
Sri Abhishek Anand, Assistant	Lecture session in training programmed for newly recruited assistants of ICAR	ICAR-CIFRI, Barrackpore on 17.02.2025-21.02.2025
Sri Sandip Kannagi. Assistant	Lecture session in training programmed for newly recruited assistants of ICAR	ICAR-CIFRI, Barrackpore on 17.02.2025-21.02.2025
Sri Sankalp Singh, Assistant	Lecture session in training programmed for newly recruited assistants of ICAR	ICAR-CIFRI, Barrackpore on 17.02.2025-21.02.2025
Mrs. Ritwika Majumdar, Assistant	Second Week phase II Training of newly joined Assistant	ICAR-CIFRI, Barrackpore on 11.03.2025-18.03.2025

वर्ष 2025 के दौरान राजभाषा संबंधित गतिविधियाँ

हिन्दी कार्यशाला

भाकृअनुप - केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 24 मार्च, 2025 को एक दिवसीय हिन्दी कार्यशाला का आयोजन किया गया । सर्वप्रथम हिन्दी कार्यशाला का शुभारंभ डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष ने संस्थान के निदेशक, डॉ. गौरांग कर, मुख्य अतिथि, श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा), राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, निजाम पैलेस, कोलकाता तथा सभी प्रभागाध्यक्षों/अनुभाग प्रभारियों व प्रतिभागियों का हार्दिक अभिनंदन एवं स्वागत करते हुए कार्यक्रम का संचालन किया। हिन्दी कार्यशाला का आयोजन माननीय निदेशक, डॉ. गौरांग कर की अध्यक्षता में संस्थान के व्याख्यान कक्ष में की गई।

तत्पश्चात हिन्दी कार्यशाला में पधारे श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा), राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, कोलकाता द्वारा कार्यालय में प्रयोग होने वाली हिन्दी के विभिन्न विधाओं को कार्यशाला के दौरान अपनी व्याख्यान में समाहित किया तथा हिन्दी टिप्पण, मसौदा लेखन, पत्र लेखन के साथ हिन्दी के उद्भव एवं विकास का सारगर्भित परिचय देते हुए कार्यशाला में सम्मिल्लित समस्त अधिकारियों एवं कर्मचारियों का ध्यान केन्द्रित रखा। उन्होंने 'गागर में सागर' लोकोक्ति को चरितार्थ करते हुए बहुत ही आसान हिन्दी भाषा में इसके प्रयोग की आवश्यकता को कार्यशाला के माध्यम से साझा किया । श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा) द्वारा संस्थान के अधिकारियों एवं कर्मचारियों की जिज्ञासा को भी सम्मान प्रदान किया गया तथा तकनीकी सत्र में सोदाहरण एवं सविस्तार चर्चा की गई।

निदेशक महोदय ने अपने अध्यक्षीय सम्बोधन में कार्यशाला में आमंत्रित श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा) के साथ संस्थान के सभी प्रभागाध्यक्ष, प्रभारी तथा अधिकारियों एवं कर्मचारियों को धन्यवाद ज्ञापित करते हुए सभी का उत्साहवर्धन किया । उन्होंने कहा कि राजभाषा हिन्दी में कार्य करना हमारा संवैधानिक दायित्व है। इसलिए हमें कार्यालयीन कार्य हिन्दी में करने पर किसी भी प्रकार की असमंजसता नहीं होनी चाहिए । हमें कार्यालय के अधिकांश कार्यों में हिन्दी का प्रयोग करना चाहिए। साथ ही भारत सरकार, गृह मंत्रालय, राजभाषा विभाग द्वारा संस्थान को वर्ष 2023-2024 हेतु हिन्दी में उत्कृष्ट कार्य सम्पन्न करने के लिए दिनांक 5 मार्च, 2024 को गुवाहाटी में आयोजित क्षेत्रीय राजभाषा सम्मेलन के दौरान संघ के राजभाषा नीति के श्रेष्ठ निष्पादन के लिए 'ग' क्षेत्र में "प्रथम" पुरस्कार प्राप्त करने हेतु बधाई दिया।

अतः यह कार्यशाला समस्त प्रतिभागियों हेतु बहुत उपयोगी एवं सार्थक तथा उद्देश्यपूर्ण रहा। इस कार्यशाला के सफल आयोजन में हिन्दी कक्ष से संबंधित श्री मनोज कुमार राय, सहायक प्रशासनिक अधिकारी तथा श्री विकास कुमार केशरी, हिन्दी अनुवादक द्वारा महति भूमिका निभाई गई। कार्यशाला में कुल 76 अधिकारियों एवं कर्मचारियों ने भाग लिया।

अंत में डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष के धन्यवाद ज्ञापन के साथ हिन्दी कार्यशाला का समापन हुआ।

तिमाही हिन्दी कार्यशाला (जनवरी-मार्च 2025) के दौरान मंचासीन मुख्य अतिथि वक्ता श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा) सहित संस्थान के निदेशक, डॉ. गौरांग कर एवं डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष।

तिमाही हिन्दी कार्यशाला (जनवरी-मार्च 2025) के दौरान संस्थान के अधिकारियों एवं कर्मचारियों को प्रशिक्षण प्रदान करते मुख्य अतिथि वक्ता श्री फतेह बहादुर सिंह, सहायक निदेशक (भाषा)

भाकृअनुप - केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 17 जून, 2025 को संस्थान के निदेशक, डॉ. गौरांग कर की अध्यक्षता में एक दिवसीय हिन्दी कार्यशाला का आयोजन व्याख्यान कक्ष किया गया । हिन्दी कार्यशाला का शुभारंभ डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष द्वारा संस्थान के निदेशक, डॉ. गौरांग कर; मुख्य अतिथि एवं वक्ता श्री लखन कुमार सिंह, सहायक निदेशक (राजभाषा), हिन्दी शिक्षण योजना, राजभाषा विभाग, गृह मंत्रालय, भारत सरकार तथा सभी प्रभागाध्यक्षों/अनुभाग प्रभारियों व प्रतिभागियों का हार्दिक अभिनंदन एवं स्वागत करते हुए किया गया। तत्पश्चात संस्थान के निदेशक महोदय द्वारा अतिथि वक्ता श्री लखन कुमार सिंह, सहायक निदेशक (राजभाषा) को अंगवस्त्र भेंट कर सम्मानित किया गया।

उक्त हिन्दी कार्यशाला में श्री लखन कुमार सिंह, सहायक निदेशक (राजभाषा), राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, कोलकाता द्वारा कार्यालय में प्रयुक्त होने वाली पत्राचार के विभिन्न विधाओं के विषय में व्याख्यान दिया गया तथा हिन्दी टिप्पण लेखन, मसौदा लेखन, पत्र लेखन के संबंध में विस्तृत चर्चाएं की गई । कार्यालय में प्रयोग होने वाली पत्राचार को औपचारिक बताते हुए उनके द्वारा इस विधा के विभिन्न पहलूओं को प्रशिक्षण के दौरान चर्चा करते हुए वाक्य विन्यास तथा भाषा शैली के महत्व पर भी ध्यान आकर्षित किया गया । उनके प्रशिक्षण का केंद्र बिंदु कार्यालयीन पत्राचार था, जिसका बहुआयामी प्रयोग के माध्यम से हिन्दी कार्यशाला में उपस्थित सभी अधिकारियों एवं कर्मचारियों को प्रशिक्षित किया गया, जिसका सविस्तार चर्चा निम्न है :-

- अतिथि वक्ता ने कार्यालयीन पत्र लेखन विधा के अंतर्गत कार्यालय में प्रयुक्त होने वाले पत्राचार के प्रकार के (शासकीय तथा अर्धशासकीय) महत्व को सविस्तार चर्चा करते हुए समझाया कि इस प्रकार के पत्रों का प्रयोग मंत्रालयों, विभागों अथवा कार्यालयों में सरकारी सूचना आदान-प्रदान के संदर्भ से किया जाता है। इनकी भाषा शैली अत्यंत ही सरल, सहज एवं सुस्पष्ट होती है, जिससे पत्राचार करते समय किसी भी प्रकार की भ्रम की स्थिति उत्पन्न न हो तथा सहजता के साथ पत्राचार की प्रक्रिया सम्पन्न किया जा सके।

- उन्होंने शासकीय पत्र में प्रयोग होने वाली औपचारिक पत्र के अंतर्गत बताते हुए इसे आदेशात्मक या प्रतिक्रियात्मक स्वरूप वाला बताया, जिसका उद्देश्य आधिकारिक जानकारी देने या कार्यालय आदेश, ज्ञापन इत्यादि जारी करने के रूप में किया जाता है । जिसकी भाषा शैली भी सरल, सुबोधक और सम्मानजनक होती है।

- अर्धशासकीय पत्र के संबंध में उन्होंने बताया कि कार्यालय के अधिकारी दूसरे समान पद के अधिकारी के साथ संवाद स्थापित करने के लिए इस प्रकार के अर्धशासकीय पत्र का प्रयोग करते हैं, जो अत्यंत सरल एवं व्यवहारिक भाषा के चयन द्वारा पत्राचार की जाती है । यह पत्र शासकीय पत्र की तुलना में कम औपचारिक होता है। इसका प्रयोग साधरणतः काम को गति प्रदान करने के लिए या जानकारी को प्राप्त करने के उद्देश्य से किया जाता है। इसका उपयोग किसी अधिकारी को व्यक्तिगत रूप से समस्या का निराकरण करने हेतु ध्यानाकर्षित करने के

लिए किया जाता है। इसके प्रयुक्त कर्ता पदनाम रहित केवल अपना नाम लिखता है।

- उन्होंने हिन्दी कार्यशाला के दौरान सरकारी कार्यालयों में मसौदा लेखन के महत्व पर भी प्रकाश डालते हुए जानकारी साझा किया कि मसौदा लेखन में कई प्रकार की पहलुओं से होकर जाना पड़ता है। यदि कोई पत्र प्राप्त हुआ है तो सबसे पहले उस पर टिप्पणी लिखनी होती है, जिसमें विभिन्न प्रकार के निर्णय पर सुझाव प्रदान किया जाता है, फिर उसे सक्षम प्राधिकारी के समक्ष अनुमोदन के लिए प्रस्तुत किया जाता है। इस प्रक्रिया में भी भाषा शैली अत्यंत सरल तथा सुबोध रखनी होती है।

इस प्रकार कार्यशाला में सम्मिल्लित समस्त अधिकारियों एवं कर्मचारियों का ध्यान केन्द्रित करते हुए वक्ता और प्रतिभागियों के बीच परस्पर चर्चाए निरंतर बनी रही तथा तथा तकनीकी सत्र में बहुत सारी जानकारियों को सोदाहरण एवं सविस्तार साझा किया गया।

निदेशक महोदय ने अपने अध्यक्षीय सम्बोधन में कार्यशाला में आमंत्रित श्री लखन कुमार सिंह, सहायक निदेशक (राजभाषा) के साथ संस्थान के सभी प्रभागाध्यक्ष, प्रभारी तथा अधिकारियों एवं कर्मचारियों को हिन्दी के प्रगामी प्रयोग का अह्वान करते हुए उत्साहवर्धन किया। उन्होंने अपने अभिभाषण में कहा कि राजभाषा हिन्दी में कार्य करना हमारा संवैधानिक दायित्व है। इसलिए हमें कार्यालयीन कार्य हिन्दी में करने पर किसी भी प्रकार की असहजता नहीं रखनी चाहिए और व्यक्तिगत रूप से हिन्दी के प्रयोग में निरंतर बढ़ना चाहिए।

इस प्रकार यह कार्यशाला समस्त प्रतिभागियों हेतु अत्यंत उपयोगी एवं सार्थक तथा उद्देश्यपूर्ण रहा। इस कार्यशाला के सफल आयोजन में हिन्दी कक्ष से संबंधित श्री मनोज कुमार राय, सहायक प्रशासनिक अधिकारी तथा श्री विकास कुमार केशरी, हिन्दी अनुवादक द्वारा महति भूमिका निभाई गई। कार्यशाला में कुल 75 अधिकारियों एवं कर्मचरियों ने भागलिया।

अंत में डॉ. सुनीति कुमार झा, प्रधान वैज्ञानिक के धन्यवाद ज्ञापन के साथ हिन्दी कार्यशाला का समापन हुआ।

तिमाही हिन्दी कार्यशाला (अप्रैल-जून 2025) के दौरान मंचासीन मुख्य अतिथि वक्ता श्री लखन कुमार सिंह सहित संस्थान के निदेशक, डॉ. गौरांग कर एवं समस्त प्रभागाध्यक्ष का स्वागत करते हुए डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष।

मुख्य अतिथि वक्ता श्री लखन कुमार सिंह का अभिनंदन करते संस्थान के निदेशक, डॉ. गौरांग कर एवं अन्य अधिकारीगण।

भाकृअनुप - केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 18 सितम्बर, 2025 को एक दिवसीय हिन्दी कार्यशाला का आयोजन संस्थान के सभागार में किया गया। हिन्दी कार्यशाला का शुभारंभ डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष द्वारा मुख्य अतिथि एवं वक्ता डॉ. नवीन प्रजापति, पूर्व वरिष्ठ प्रबंधक (राजभाषा), डी.वी.सी. कोलकाता तथा सभी प्रभागाध्यक्षों / अनुभाग प्रभारियों व प्रतिभागियों का हार्दिक अभिनंदन एवं स्वागत करते हुए किया गया। तत्पश्चात कार्यशाला की अध्यक्षता कर रहे फसल सुधार प्रभाग के प्रभागाध्यक्ष डॉ. जीवन मित्रा द्वारा अतिथि वक्ता डॉ. नवीन प्रजापति, पूर्व वरिष्ठ प्रबंधक (राजभाषा) को पटसन निर्मित पुष्पगुच्छ भेंट कर सम्मानित किया गया।

हिन्दी कार्यशाला में डॉ. नवीन प्रजापति, पूर्व वरिष्ठ प्रबंधक (राजभाषा), डी.वी.सी. कोलकाता द्वारा बडे ही रोचक पूर्ण तरीके से कार्यशाला का शुभारम्भ "भारतीय संविधान के परिप्रेक्ष्य में राजभाषा के महत्वपूर्ण पहलुओं" नामक विषय से शुरू किया गया। उन्होंने अपने व्याख्यान में यह बताया कि कैसे राजभाषा का महत्व संवैधानिक रूप से निरंतर बढ़ रहा है। उन्होंने संविधान के नीति, नियमों तथा राजभाषा से संबंधित भाग का भी सविस्तार चर्चा करते हुए कार्यालय में अधिकारियों तथा कर्मचारियों का राजभाषा के प्रति नैतिक जिम्मेदारी की ओर ध्यानाकर्षण किया। उन्होंने एक ओर कार्यालय में राजभाषा से संबंधित प्रयुक्त होने वाली विभिन्न पहलूओं के विषय में चर्चा की तो साथ ही दूसरी ओर व्यक्ति की मानसिक चिंतन तथा कौशल विकास को अद्यतित करते रहने की सलाह भी प्रदान की। अतिथि वक्ता ने कार्यशाला में सम्मिलित समस्त अधिकारियों एवं कर्मचारियों का ध्यान केन्द्रित करते हुए परस्पर चर्चा के माध्यम से राजभाषा के महत्व पर सविस्तार व्याख्यान प्रस्तुत किया।

अपने अध्यक्षीय सम्बोधन में डॉ. जीवन मित्रा ने कार्यशाला में आमंत्रित डॉ. नवीन प्रजापति, पूर्व वरिष्ठ प्रबंधक (राजभाषा) के साथ-साथ संस्थान के सभी प्रभागाध्यक्ष, प्रभारी तथा अधिकारियों एवं कर्मचारियों को हिन्दी के प्रगामी प्रयोग का अह्वान करते हुए उत्साहवर्धन किया। उन्होंने अपने अभिभाषण में कहा कि राजभाषा हिन्दी में कार्य करना हमारा संवैधानिक दायित्व है। इसलिए हमें कार्यालयीन कार्यों को राजभाषा हिन्दी में करने पर किसी भी प्रकार की असहजता नहीं रखनी चाहिए और व्यक्तिगत रूप से हिन्दी के प्रयोग में निरंतर बढ़ना चाहिए।

इस प्रकार यह कार्यशाला समस्त प्रतिभागियों हेतु अत्यंत उपयोगी एवं सार्थक तथा उद्देश्यपूर्ण रहा। इस कार्यशाला के सफल आयोजन में हिन्दी कक्ष से संबंधित श्री मनोज कुमार राय, सहायक प्रशासनिक अधिकारी तथा श्री विकास कुमार केशरी, हिन्दी अनुवादक द्वारा महति भूमिका निभाई गई। कार्यशाला में कुल 80 अधिकारियों एवं कर्मचरियों ने भाग लिया।

अंत में डॉ. सुनीति कुमार झा, प्रधान वैज्ञानिक के धन्यवाद ज्ञापन के साथ हिन्दी कार्यशाला का समापन हुआ।

मुख्य अतिथि वक्ता डॉ. नवीन प्रजापति का अभिनंदन करते फसल सुधार प्रभाग के प्रभागाध्यक्ष डॉ. जीवन मित्रा एवं अन्य अधिकारी गण।

तिमाही हिन्दी कार्यशाला के दौरान प्रशिक्षण प्रदान करते हुए मुख्य अतिथि डॉ. नवीन प्रजापति, पूर्व वरिष्ठ प्रबंधक (राजभाषा), डी.वी.सी. कोलकाता।

भाकृअनुप - केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 17 दिसम्बर, 2025 को एक दिवसीय हिन्दी कार्यशाला का आयोजन संस्थान के व्याख्यान कक्ष में किया गया। हिन्दी कार्यशाला का शुभारंभ डॉ. कुमार निशांत चौरसिया, वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष द्वारा मुख्य अतिथि वक्ता श्री लखन कुमार सिंह, सहायक निदेशक, हिन्दी शिक्षण योजना, राजभाषा विभाग, गृह मंत्रालय, कोलकाता तथा सभी प्रभागाध्यक्षों / अनुभाग प्रभारियों व प्रतिभागियों का हार्दिक अभिनंदन एवं स्वागत करते हुए किया गया। कार्यशाला की अध्यक्षता फसल सुधार प्रभाग के प्रभागाध्यक्ष एवं प्रभारी, निदेशक, डॉ. जीवन मित्रा द्वारा किया गया।

हिन्दी कार्यशाला में श्री लखन कुमार सिंह, सहायक निदेशक, हिन्दी शिक्षण योजना, कोलकाता द्वारा बडे ही रोचक पूर्ण तरीके से कार्यशाला का शुभारम्भ "राजभाषा नीति एवं नियम" विषय के माध्यम से शुरू किया गया। उन्होंने अपने व्याख्यान में यह बताया कि राजभाषा मुख्य रूप से प्रेरणा, प्रोत्साहन एवं पुरकार के रूप में अपना कार्य करती है। उन्होंने कहा कि भारत का संविधान 26 नवंबर, 1949 को संविधान सभा द्वारा लिखा और अपनाया गया था, लेकिन यह पूरी तरह से 26 जनवरी, 1950 को लागू हुआ। उन्होंने अनुच्छेद 343 का पूरी विस्तार से चर्चा करते हुए कहा कि अनुच्छेद 343 संघ की राजभाषा से संबंधित है, जिसके अनुसार हिन्दी संघ की राजभाषा है और इसकी लिपि देवनागरी; साथ ही इसमें यह भी प्रावधान सम्मिलित है कि हिन्दी के साथ अंग्रेजी इसकी सहायक भाषा के रूप में 15 वर्षों तक अर्थात् 1965 तक चलती रहेगी और जब तक इस देश की सारी विधान सभा में इस आशय का आदेश पारित न होता है, तब तक यह हिन्दी के साथ चलती रहेगी।

संविधान के नीति, नियमों तथा राजभाषा से संबंधित भाग का भी सविस्तार चर्चा करते हुए कार्यालय में अधिकारियों तथा कर्मचारियों का राजभाषा के प्रति नैतिक जिम्मेदारी की ओर ध्यानाकर्षण किया। उन्होंने एक ओर कार्यालय में राजभाषा से संबंधित प्रयुक्त होने वाली विभिन्न पहलूओं के विषय में चर्चा की तो साथ ही दूसरी ओर व्यक्ति की नैतिक जिम्मेदारी का भी बोध कराया। इस प्रकार अतिथि वक्ता द्वारा कार्यशाला में सम्मिल्लित समस्त अधिकारियों एवं कर्मचारियों का ध्यान केन्द्रित करते हुए परस्पर चर्चा के माध्यम से राजभाषा के महत्व पर सविस्तार व्याख्यान प्रस्तुत किया गया।

श्री लखन कुमार सिंह, सहायक निदेशक, हिन्दी शिक्षण योजना, कोलकाता ने संघ की राजभाषा नीति के उत्कृष्ट कार्यान्वयन तथा राजभाषा के प्रगामी प्रयोग हेतु वर्ष 2024-2025 के लिए क्षेत्रीय राजभाषा पुरस्कार हेतु प्रभारी, निदेशक महोदय सहित हिन्दी कक्ष एवं संस्थान के सभी कार्मिकगण को हार्दिक बधाई एवं शुभकमनाएं दिया एवं भूरी-भूरी प्रशंसा की।

अपने अध्यक्षीय सम्बोधन में डॉ. जीवन मित्रा ने कार्यशाला में आमंत्रित श्री लखन कुमार सिंह, सहायक निदेशक (राजभाषा), हिन्दी शिक्षण योजना, राजभाषा विभाग, कोलकाता के साथ-साथ संस्थान के सभी प्रभागाध्यक्ष, प्रभारी तथा अधिकारियों एवं कर्मचारियों को हिन्दी के प्रगामी प्रयोग का अह्वान करते हुए उत्साहवर्धन किया। उन्होंने अपने अभिभाषण में कहा कि राजभाषा हिन्दी में कार्य करना हमारा संवैधानिक दायित्व है। इसलिए हमें कार्यालयीन कार्यों को राजभाषा हिन्दी में करने पर किसी भी प्रकार की असहजता नहीं रखनी चाहिए और व्यक्तिगत रूप से हिन्दी के प्रयोग में निरंतर बढ़ना चाहिए। इस अवसर पर संस्थान के डॉ. एस. सतपथी, प्रभागाध्यक्ष, फसल सुरक्षा एवं डॉ. संजय साहा, प्रभागाध्यक्ष, फसल उत्पादन ने अपने-अपने संबोधन में कहा कि हमें हिन्दी में कार्यालयीन कार्य करने का यथासंभव प्रयास करना चाहिए।

इस प्रकार यह कार्यशाला समस्त प्रतिभागियों हेतु अत्यंत उपयोगी एवं सार्थक तथा उद्देश्यपूर्ण रहा। इस कार्यशाला के सफल आयोजन में हिन्दी कक्ष से संबंधित श्री मनोज कुमार राय, सहायक प्रशासनिक अधिकारी तथा श्री विकास कुमार केशरी, हिन्दी अनुवादक द्वारा महति भूमिका निभाई गई। कार्यशाला में कुल 82 अधिकारियों एवं कर्मचारियों ने भाग लिया।

अंत में श्रीमती सतरूपा राय चौधुरी, सहायक के धन्यवाद ज्ञापन के साथ हिन्दी कार्यशाला का समापन हुआ।

तिमाही हिन्दी कार्यशाला (अक्टूबर-दिसम्बर 2025) के दौरान मंचासीन मुख्य अतिथि वक्ता सहित संस्थान के प्रभारी निदेशक, प्रभागाध्यक्ष एवं प्रभारी, हिन्दी कक्ष।

तिमाही हिन्दी कार्यशाला के दौरान प्रशिक्षण प्रदान करते हुए मुख्य श्री लखन कुमार सिंह, सहायक निदेशक, हिन्दी शिक्षण योजना, कोलकाता।

हिन्दी सप्ताह 2025

भाकृअनुप-केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 12-18 सितम्बर, 2025 तक हिन्दी सप्ताह का आयोजन किया गया। समारोह का उद्घाटन 12 सितम्बर, 2025 को फसल सुधार प्रभाग के प्रभागाध्यक्ष डॉ. जीवन मित्रा द्वारा किया गया। उद्घाटन समारोह के दौरान उन्होंने अपने संबोधन में कहा कि संविधान सभा द्वारा राज-काज चलाने के लिए तथा केन्द्र व राज्यों के बीच सम्पर्क भाषा की भूमिका निभाने का उत्तरदायित्व हिन्दी को सौंपा गया है, क्योंकि यह देश के अधिकांश भागों में बोली व समझी जाती है। किसी भी देश या वर्ग विशेष की पहचान उसकी भाषा और संस्कृति से होती है, इसलिए हमें अपनी पहचान बनाए रखने के लिए हिन्दी को अपनाना आवश्यक है।

डॉ. सुब्रत सतपथी, प्रभागाध्यक्ष, फसल सुरक्षा ने संस्थान में समय-समय पर आयोजित होने वाली राजभाषा हिन्दी से संबंधित आयोजनों पर संतोष व्यक्त करते हुए कहा कि इससे संस्थान के अधिकारियों एवं कर्मचारियों को हिन्दी कार्य के प्रति जागरूकता बढ़ेगी और वे अपना कार्यालयीन कार्यों में हिन्दी का अधिकाधिक प्रयोग करेंगे। डॉ. सब्यसाची मित्र, प्रधान वैज्ञानिक एवं प्रभारी, ए.आई.एन.पी., श्री रवि मिश्र, प्रशासनिक अधिकारी एवं श्री पलाश तिवारी, वित्त एवं लेखाधिकारी ने भी अपने-अपने संबोधन में कहा कि हिन्दी बहुत ही सरल, सहज और आसान भाषा है; जिसे हमें अपने-अपने कार्यालयीन कार्यों में सर्वाधिक प्रयोग करना चाहिए।

उद्घाटन समारोह कार्यक्रम का संचालन करते हुए डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष ने इस अवसर पर उपस्थित अधिकारियों एवं कर्मचारियों का संस्थान की राजभाषा कार्यान्वयन समिति एवं हिन्दी कक्ष की ओर से हार्दिक स्वागत करते हुए उन्हें हिन्दी सप्ताह के अन्तर्गत आयोजित किए जाने वाली विभिन्न हिन्दी प्रतियोगिताओं के बारे में जानकारी दी। उन्होंने संस्थान के सभी वर्गों के कर्मचारियों से कार्यालयीन कार्यों में अधिकाधिक हिन्दी का प्रयोग करने के लिए अनुरोध किया।

हिन्दी सप्ताह-2025 के अन्तर्गत विभिन्न हिन्दी प्रतियोगिताओं का आयोजन किया गया। दिनांक 12 सितम्बर, 2025 को तात्कालिक भाषण प्रतियोगिता, दिनांक 15 सितम्बर, 2025 को हिन्दी टिप्पण एवं मसौदा लेखन प्रतियोगिता, दिनांक 16 सितम्बर, 2025 को हिन्दी निबंध लेखन प्रतियोगिता तथा दिनांक 17 सितम्बर, 2025 को कम्प्यूटर पर हिन्दी टंकण प्रतियोगिता का आयोजन किया गया। इन सभी प्रतियोगिताओं में संस्थान के सभी वर्गों के अधिकारियों व कर्मचारियों ने उत्साहपूर्वक भाग लिया।

दिनांक 18 सितम्बर, 2025 को अत्यंत उत्साह पूर्ण वातावरण में हिन्दी सप्ताह का समापन एवं पुरस्कार वितरण समारोह का आयोजन किया गया। कार्यक्रम का संचालन करते हुए डॉ. सुरेन्द्र कुमार पाण्डेय, प्रधान वैज्ञानिक एवं प्रभारी, हिन्दी कक्ष ने सभागार में उपस्थित अधिकारियों एवं कर्मचारियों का राजभाषा कार्यान्वयन समिति एवं हिन्दी कक्ष की ओर से हार्दिक अभिनन्दन करते हुए उन्होंने हिन्दी सप्ताह-2025 के अन्तर्गत आयोजित किए गए विभिन्न प्रतियोगिताओं के विजेता (प्रथम, द्वितीय एवं तृतीय) प्रतिभागियों के नामों की घोषणा की। कार्यक्रम की अध्यक्षता संस्थान के निदेशक, डॉ. गौरांग कर द्वारा किया गया तथा इनके साथ डॉ. जीवन मित्रा, प्रभागाध्यक्ष, फसल सुधार; डॉ. सुब्रत सतपथी, प्रभागाध्यक्ष, फसल सुरक्षा; डॉ. सुनीति कुमार झा, प्रधान वैज्ञानिक; श्री रवि मिश्र, प्रशासनिक अधिकारी एवं श्री पलाश तिवारी, वित्त एवं लेखा अधिकारी मंचासीन थे। निदेशक महोदय ने अपने अध्यक्षीय सम्बोधन में कहा कि हमारा देश परम्परा एवं संस्कृति प्रधान देश है। देश में अनेक भाषाएं बोली जाती हैं, किंतु राजभाषा का अपना अलग ही स्थान है। राजभाषा कार्यान्वयन की दिशा में संस्थान ने बहुत अच्छी प्रगति की है। इस अवसर पर उन्होंने अपने अभिभाषण में यह भी कहा कि हिन्दी हमारी राजभाषा होने के साथ ही सरलतम भाषा भी है। इसके प्रचार-प्रसार में तीव्रतम गति लाने की आवश्यकता है; उन्होंने कहा कि हिन्दी भाषा साधारण जनता तथा किसान भाइयों के साथ संपर्क बनाने का बेहतर एवं सशक्त माध्यम है क्योंकि इस भाषा को लगभग हर भारतीय समझता तथा बोलता है। इसके अतिरिक्त संस्थन द्वारा प्रकाशित अर्धवार्षिक राजभाषा पत्रिका "रेशा किरण" अंक 8 भाग 1 का विमोचन भी किया गया।

विभिन्न प्रतियोगिताओं में प्रथम, द्वितीय व तृतीय स्थान प्राप्त करने वाले अधिकारियों/कर्मचारियों को निदेशक महोदय सहित कार्यालय के समस्त गणमान्य वृन्दों के कर कमलों द्वारा पुरस्कृत किया गया। साथ ही हिन्दी प्रोत्साहन योजना 2024-2025 के अंतर्गत चयनित 04 (चार) अधिकारियों तथा कर्मचारियों को भी पुरस्कार प्रदान किया गया।

कार्यक्रम का समापन डॉ. सुनीति कुमार झा, प्रधान वैज्ञानिक के धन्यवाद ज्ञापन के साथ सम्पन्न हुआ।

अर्धवार्षिक राजभाषा पत्रिका 'रेशा किरण' के अंक 8 संख्या 1 का विमोचन करते हुए संस्थान के निदेशक एवं अधिकारीगण

राजभाषा कार्यान्वयन समिति की बैठक

संस्थान में राजभाषा कार्यान्वयन समिति की चार बैठकें क्रमशः दिनांक 10.03.2025, 18.06.2025, 10.09.2025 एवं 19.12.2025 को माननीय निदेशक, डॉ. गौरांग कर जी की अध्यक्षता में आयोजित की गई। राजभाषा कार्यान्वयन समिति की वर्ष में चार बैठकों का आयोजन किया गया। इन बैठकों में संस्थान में हो रही विभिन्न गतिविधियों में हिन्दी के प्रगतिशील प्रयोग के तरीकों और साधनों पर चर्चाएं की गई। इसके अलावा इन बैठकों में संस्थान के अधिकारियों एवं कर्मचारियों को राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम (2025-2026) के अनुसार "ग" क्षेत्र के लिए निर्धारित 60 प्रतिशत लक्ष्यों पर भी चर्चा की गई। सभी बैठकों के अंत में अध्यक्ष महोदय के प्रति धन्यवाद ज्ञापन के साथ बैठक समाप्त हुई।

महत्वपूर्ण उपलब्धियाँ

संस्थान ने प्रशासन के क्षेत्र में भी काफी महत्पूर्ण उपलब्धियाँ प्राप्त की हैं :-

1. भारत सरकार की राजभाषा नीति के प्रावधानों, राजभाषा अधिनियम, 1963 और उक्त अधिनियम के तहत बनाए गए राजभाषा नियम, 1976 का कार्यान्वयन किया जाता है।
2. हिन्दी का कार्यसाधक ज्ञान रखने वाले अधिकारियों / कर्मचारियों के लिए जुलाई-दिसम्बर माह के दौरान दो हिन्दी कार्यशालाओं का आयोजन किया गया है।
3. राजभाषा विभाग, गृह मंत्रालय द्वारा समय-समय पर जारी आदेशों का कार्यान्वयन किया जाता है।
4. राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम का क्रियान्वयन किया जाता है।
5. संस्थान की राजभाषा कार्यान्वयन समिति से संबंधित सभी मामलों पर एजेंडा नोट्स तैयार कर तथा बैठकों का आयोजन व तत्पश्चात कार्यवृत्त तैयार कर उन पर अनुवर्ती कार्रवाई की जाती है।
6. संस्थान की राजभाषा कार्यान्वयन समिति की बैठकों में होने वाली चर्चायें सिर्फ और सिर्फ हिन्दी में की गयी हैं तथा उसे अमल में लाया जाता है।

7. विहित फार्मों एवं सभी मानक मसौदे द्विभाषी रूप में तैयार किए गए हैं।
8. रजिस्टरों के शीर्षक द्विभाषी रूप में तैयार किए गए हैं।
9. संस्थान में सभी रबर की मोहरें, नाम पट्ट, शीर्षक-पत्र इत्यादि द्विभाषी में तैयार किए गए हैं।
10. संस्थान में धारा 3(3) के अन्तर्गत आने वाले संस्थान के सभी दर आमंत्रण, निविदा-प्रपत्र, निविदा सूचनाएं एवं बिक्री सूचनायें आदि द्विभाषी रूप में जारी किए जाते हैं।
11. संस्थान की विभिन्न बैठकों में होने वाली चर्चायें भी अधिकांशत: हिन्दी में ही की गयी हैं।
12. अन्य भाषा-भाषी लोगों के हिन्दी शब्द ज्ञान हेतु प्रतिदिन हिन्दी का एक शब्द 'आज का शब्द' लिखा जाता है।
13. हिन्दी अनुभाग में प्रविष्टियाँ, टिप्पणी एवं मसौदा लेखन व अन्य कार्य हिन्दी में ही किए गए हैं तथा अन्य अनुभागों में भी अधिकांश प्रविष्टियाँ, टिप्पणी एवं मसौदा लेखन हिन्दी में ही करने के निर्देश दिए गए हैं।
14. संस्थान के सभी कम्प्यूटरों में द्विभाषी रूप में काम करने के लिए यूनीकोड की सुविधा उपलब्ध कराई गयी है।
15. 'नगर राजभाषा कार्यान्वयन समिति' कोलकाता (कार्यालय-2), सीएसआईआर-केंद्रीय काँच एवं सिरामिक अनुसंधान संस्थान, 196 राजा एस.सी. मल्लिक रोड़, कोलकाता - 700032) की छमाही बैठकों में संस्थान की ओर से संस्थान के निदेशक सहित अन्य अधिकारी भाग लेते हैं।
16. प्रशासनिक अनुभागों सहित अन्य प्रभागों में भी टिप्पणी तथा मसौदा लेखन आदि कार्य ई-ऑफिस के माध्यम से हिन्दी में किए जा रहे हैं।
17. हिन्दी में प्राप्त पत्रों के उत्तर शत-प्रतिशत हिन्दी में दिए जाते हैं।

MAJOR EVENTS & CELEBRATIONS

Visit of Hon'ble Textile Minister, Sri Giriraj Singh Ji

ICAR-CRIJAF organized a Jute Growers' Industries and Stakeholders Meet on 2nd January 2025, graced by Hon'ble Union Minister of Textiles, Shri Giriraj Singh, as the Chief Guest. The minister toured the institute's museum, technology hall, research labs, biotechnology unit, and research fields and interacted intensively with stakeholders, SHGs, and scientists. He praised ICAR-CRIJAF's role in varietal development, skill-building, and jute-based livelihood generation, especially highlighting the success of 'Lakhpati Didis'. Shri Singh emphasized promoting the jute-rice-flax cropping system and diversifying jute use for bio-ethanol, bio-CNG, paper pulp, and more. He also launched documentary videos, a book on jute research, and witnessed product displays by SHGs. Two MoUs were signed with Shaktigarh Textiles for a pilot project on biofuel from jute biomass, and with Jayshree Textiles and OG Hemp to scale up flax cultivation. Over 400 participants, including farmers, SHG members, industries, and media, attended. The minister lauded the institute's impactful contribution to jute sector advancement.

The Jute Industries-Stakeholders Meet

On the same day of visit of Hon'ble Minister of 2nd January 2025, the Jute-Industries-Stakeholder Meet was organized at the Lecture Hall of ICAR-CRIJAF, Barrackpore. The director presented a comprehensive briefing on bast and allied fibres, delving into their unique properties, cultivation practices, and potential for expanded utilization. Following this, the Indian Jute Mills Association (IJMA) unveiled a roadmap aimed at upscaling the cultivation and utilization of these versatile fibres. The plan outlined strategies for increasing the area under cultivation, improving agronomic practices, and promoting the adoption of advanced processing technologies. A key initiative called OG Hemp was also introduced, with the goal of reducing India's dependence on imported flax fibres and fabrics by boosting domestic production and processing capabilities. The Hon'ble Minister of

Visit of Shri Giriraj Singh, Hon'ble Union Minister of Textiles during 2-3 January 2025 in ICAR-CRIJAF

Textiles, Sri Giriraj Singh Ji, expressed strong support for these efforts, advocating for the adoption of a jute-rice-flax cropping system that would optimize land use and provide farmers with additional income streams. The minister also called upon the industry to play a proactive role in supporting the expansion of flax cultivation, investing in state-of-the-art fibre processing facilities, and exploring new markets for these sustainable and eco-friendly products, both domestically and internationally.

Celebration of 78th Republic Day

ICAR-CRIJAF celebrated the 76th Republic Day on 26 January 2025 at its campus. The event commenced with the hoisting of the national flag by the director, followed by the singing of the national anthem. The director paid homage to the great leaders and freedom fighters whose sacrifices paved the way for India's independence and the establishment of the Republic. The celebration reflected a deep sense of national pride among the staff, students, and workers of the institute.

Celebration of 73rd Foundation day

The Institute celebrated 73rd Foundation Day on 10th February, 2025. In this occasion Scientist-Farmers/SHGs interaction programme was also organized. In this auspicious occasion, Dr. Ashok Kumar Patra, Vice Chancellor Bidhan Chandra Krishi Viswa Vidyalaya, Mohanpur was the Chief Guest. Dr. D. B. Shakywar, Director, ICAR-NINFET, Kolkata, and Dr. Pradip Dey, Director, ICAR-ATARI, Kolkata were the Guests of Honor. On the occasion, Dr. Ashok Kumar Patra, the Chief Guest of the function congratulated the Director and all staff of the institute for the commendable achievements and continuous efforts for the service of the jute farmers. Dr Patra was quite optimistic that the all-round activities of the institute will again reinstead jute as one of the most economical crops and re-establish as the golden fibre. Dr. D. B. Shakywar, Director, ICAR-NINFET congratulated the staffs and previous workers who has brought the institute to its present state. He reiterated strong collaboration with CRIJAF for overall development of jute sector.

Jute Industries-Stakeholders Meet 2025 at ICAR-CRIJAF during visit of Hon'ble Union Minister of Textiles

Celebration of 78th Republic Day at ICAR-CRIJAF

International Conference in collaboration with Brainware University

The International Conference on "Agri Next: Future Trends in Agriculture," held from February 10-12, 2025, in Barasat, Kolkata, in collaboration with ICAR-CRIJAF. The conference featured 11 technical sessions, fostering discussions on modern agricultural tools, biotechnology, agri-tourism, and marketing strategies. The distinguished guests included Dr. AK Patra, Vice-Chancellor, BCKV as the Chief Guest, alongside Dr. Gouranga Kar, Director, ICAR-CRIJAF, and Dr. Pradip Dey, Director, ICAR-ATARI as Guests of Honour. By fostering collaboration and sharing innovative ideas, the conference aimed to drive positive change in agriculture for a more sustainable future.

Kisan Samman Samaroh

On the occasion of transfer of 19th instalment of PM Kisan Samman Nidhi ICAR-CRIJAF, Barrackpore and its KVK (North 24 Pgs Additional) organized Kisan Samman Samaroh on 26th February, 2025 to witness the live viewing of release of PM Kisan Samman Nidhi instalment by Hon'ble Prime Minister Sri Narendra Modi Ji. During this programme, the release of 19th instalment of PM Kisan Samman Nidhi by Hon'ble Prime Minister Sri Narendra Modi Ji was live telecasted among more than 262 farmers and farm women. Six progressive farmers and women SHG members were felicitated by Hon'ble minister. Shri Shantanu Thakur, Hon'ble Minister of State for Port, Shipping and Waterways, Govt. of India graced this important event as the Chief Guest. In his address the Minister said that there is huge potential of the indigenous natural fibres in the foreign market. There is need to upscale the scientific cultivation, processing, value addition and marketing of jute and allied fibre-made products. He emphasized that the technologies developed by ICAR-CRIJAF and the skill development programme implemented by the institute will be very effective in this direction. The minister also told that Hon'ble Prime Minister's foresightedness to launch the PM-KSAN Samman Nidhi 6 years back has played important role in the development of Indian Agriculture and upliftment of famers of this country.

International Conference at Brainware University, Barasat (Kolkata) in collaboration with ICAR-CRIJAF

Visit of Shri Shantanu Thakur, Hon'ble Minister of State during 26 February 2025 in ICAR-CRIJAF

14th National Symposium on Coastal Agriculture (NSCA 2025)

The 14th National Symposium on Coastal Agriculture (NSCA), Harnessing Fragile Coastal Ecosystems for Food and Environmental Security, was organized at ICAR-CRIJAF from 28 February to 3 March, 2025. The symposium was organized by the Indian Society of Coastal Agricultural Research, West Bengal in collaboration with ICAR-CSSRI, Karnal; ICAR-CRIJAF, Barrackpore; and ICAR-CIFRI, Barrackpore. The symposium had the Dr. J.S.P. Yadav Memorial Lecture, the Dr. H.S. Sen Memorial Lecture, the ISCAR best paper presentation, a farmer conclave, technical sessions, and poster sessions along with exhibition stalls by various institutes and SHGs/FPCs. More than 250 scientists, researchers, academicians, students, farmers, and entrepreneurs attended the symposium.

36th Annual Workshop of All India Network Project on Jute and Allied Fibres

The 36th Annual Workshop of All India Network Project on Jute and Allied Fibres was conducted at ICAR-CRIJAF, Barrackpore, Kolkata on 17th March 2025 in hybrid mode. The inaugural programme started with the welcome address delivered by Dr. Gouranga Kar, Director, ICAR-CRIJAF, Barrackpore to the Chief Guest Dr. Sanjay Kumar, Director, ICAR-NISST, Mau, Guest of Honour Dr. P. K. Dash, ADG (Commercial Crops) ICAR New Delhi, Dr. S. Mitra, Pr. Scientist & In-Charge, AINPJAF, all the scientists of ICAR-CRIJAF HQ, all In-charges and scientists of AINPJAF centres. The workshop was attended by 52 scientists form 9 AINPJAF centres and ICAR-CRIJAF Barrackpore in hybrid mode. A tossa jute variety JRO 2024 had been identified for central release in the 36th Annual Workshop of All India Network Project on Jute and Allied Fibres, ICAR-CRIJAF by the Variety Identification Committee chaired by Dr. D. K. Yadava, DDG (Crop Science), ICAR, New Delhi.

Inauguration of 14th National Symposium on Coastal Agriculture (NSCA) at ICAR-CRIJAF

36th Annual Workshop of All India Network Project on Jute and Allied Fibres at ICAR-CRIJAF

Awareness Program on Conservation of Crop Varieties, PPV&FR Act, BDA/NBA

An awareness program was organized by ICAR-CRIJAF in collaboration with KVK, North 24 Parganas (Additional), on 'Conservation of Crop Varieties, PPV&FR Act, BDA/NBA' at KVK, North 24 Parganas (Additional), on 21 March 2025. The objective of the program was to sensitize the farmers about the protection of their rights in the areas of farm innovations, breeding, and protection of varieties, including PPV&FR Act, BDA/NBA, and conservation of varieties. A total of 50 farmers from nearby villages participated in the program.

The Tripartite MoU Signing Ceremony with Jute Industries of West Bengal

The Tripartite MoU Signing Ceremony for collaborative research, industrial trials, product development, and commercialization of bast fibre based blended yarn and products from ramie, flax, and sisal fibre was organised at the Indian Jute Industries' Research Association (IJIRA), Kolkata, on 25 April, 2025. The program was attended by Shri Giriraj Singh, Hon'ble Minister of Textile, Govt. of India, along with other dignitaries and representatives from various jute industries. The collaborative work will be carried out with Gloster Ltd. (Kolkata), Dalhousie Jute Company (Kolkata), Birla Jute Mills (South 24 Parganas), Ludlow jute & Specialities Ltd. (Kolkata), R.D.B. Textiles Ltd. (Kolkata), Kamarhatty Company Ltd., and Ambica Jute Mills (Howrah).

Showcasing in ICAR Sports Tournament for Eastern Zone 2024 (TEZ–2024)

The ICAR-CRIJAF sports contingent participated in the ICAR Sports Tournament for Eastern Zone (TEZ–2024) organized at ICAR-IVRI, Bareilly during 06-09 May, 2025. The participants showed the great skill and sportsmanship in various Track & Field events (Race, Long jump, High Jump, Relay Cycle race and Indoor games (Table tennis, Badminton, Carrom). The team bagged 06 Gold, 07 Silver and 03 Bronze medals in various events. Dr. Gouranga Kar, Director, ICAR-CRIJAF congratulated all the participants of the institute mentioning that sports provide a platform to develop different social values such as co-operation, assertion, responsibility, sympathy and self-esteem and also ascertained that the same spirit and enthusiasm should continue in other institutional activities.

Technology License Agreement (TLA) with M/s Invicta Agritech India Pvt. Ltd.,

ICAR-CRIJAF inked Technology License Agreement (TLA) with M/s Invicta Agritech India Pvt. Ltd., Secundrabad, Telengana on 22nd May, 2025 for Commercial Production and Marketing of Certified Jute Seed (JROBA-3) for next five years. The signing and exchange of TLAs took place with Mr. Saleh Siddik Ahmed, General Manager (Marketing), M/s Invicta Agritech India Pvt. Ltd., Secundrabad, Telengana, in the esteemed presence of Dr. Gouranga Kar, Director, ICAR-CRIJAF Barrackpore, Kolkata. The significance of improved jute seed varieties with higher yield potential for sustainability and higher income by resource poor farmers was highlighted by Dr. Gouranga Kar, Director, ICAR-CRIJAF. He also urged for better collaboration with private seed industries/companies for successfully dissemination of cutting edge products/technologies to key stakeholders.

Tripartite MoU Signing Ceremony with Jute Industries of West Bengal in presence of Hon'ble Union Minister of Textiles

Staff of ICAR-CRIJAF with Gold, Silver and Bronze medals during TEZ-2024 Sports tournament (6-9 May 2025)

Technology License Agreement (TLA) with M/s Invicta Agritech India Pvt. Ltd.,

11th International Yoga Day

The 11th International Yoga Day was celebrated at ICAR-CRIJAF, Barrackpore, on 21st June 2025.The celebration was organized in alignment with the theme of the year: "Yoga for One Earth, One Health." The program commenced at 7:30 AM at the dining hall of the ICAR-CRIJAF Guest House. A certified Yoga Instructor conducted a one-hour yoga session which included prayer, warm-up exercises, and various yoga asanas, pranayama, and relaxation techniques. Approximately 100 staff members, including Scientists, Technical Officers, Administrative Staff, Skilled Workers, Supporting Staff, and Labourers, actively participated in the event with great enthusiasm. The event was successfully conducted under the guidance of the Director, with the active cooperation of all staff members, thus contributing to the national mission of promoting health and wellness.

7th Scientific Advisory Committee Meeting of KVK, North 24 Parganas

7th Scientific Advisory Committee (SAC) Meeting of KVK (North 24 Parganas, Additional) was convened on 26th June 2025 under the chairmanship of Dr. Gouranga Kar, Director, ICAR-CRIJAF, to provide strategic guidance and finalization of the Action Plan 2025. The meeting began with a welcome address by Dr. A.K. Singh, Principal Scientist and Headquarter In-charge of KVK. After the introduction of members and invitees, Dr. Tanmay Samajdar presented the Action Taken Report of the 7th SAC meeting. This was followed by presentations from Dr. D. Borkotoky, SMS (Animal Sci.), on the KVK's progress during 2024, and Dr. Aravind T., SMS (Plant Protection), who presented the proposed Action Plan for 2025. All the members of the SAC and heads of ICAR-CRIJAF were present in the meeting.

11th International Yoga Day

7th Scientific Advisory Committee Meeting of KVK, North 24 Parganas

Observation of Parthenium Awareness Week

The ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata observed 'Parthenium Awareness Week' during August 16-22, 2025 to make aware among the Staff members about the menace of Parthenium, which is responsible for causing health problems in human beings and animals, besides deteriorating environment, loss of productivity and biodiversity and also to ensure Parthenium-free CRIJAF Campus.

In this juncture, an 'Awareness Meeting' was organized at the Institute on August 21, 2025. More than 100 participants including the scientists, technical, administrative and other staff, the KVK staff, project staff viz., RA/SRF/YPs and students of ICAR-IARI Kolkata Hub were present in the meeting. An eradication program was also taken up in the campus to make the Campus towards Parthenium free.

Launching programme of PM-DDKY and Pulse Atmanirbhar Mission by Hon'ble Prime Minister of India

The live launching programme of Pradhan Mantri Dhan Dhanya Krishi Yojana (PM-DDKY) for transforming India's agricultural landscape is designed to catalyse growth in 100 agri-districts through saturation-based convergence of 36 Central schemes across 11 Ministries, for a period of six years starting FY 2025-2026 by Hon'ble Prime Minister was organized at ICAR-CRIJAF, Barrackpore on 11th October, 2025 in which Hon'ble Union Minister of State, Education and North Eastern Development, Dr. Sukanta Majumdar was the Chief Guest which was attended by 470 farmers and farm women. Hon'ble Minister in his address for the famers emphasized that the Indian Farmers particularly farm women must become Atmanirbhar by adopting the benefits of Central Govt. Schemes. He emphasized that Indian Agriculture is moving in right direction, still the Pulse Mission will reduce the import and increase the nutritional security of next generation. He expressed that PM's visionary leadership will raise Indian Agriculture to new height and make the country Atmanirbhar. Hon'ble Minister also visited the Exhibition Hall and Fibre Museum and also inaugurated the exhibition of jute diversified products (JDP) and was very much impressed to see the exhibits. He advised the farm women of the Self-Help Group (SHG) to explore e-platform for better marketing of JDPs.

Celebration of Indian Constitution Day

ICAR-Central Research Institute for Jute & Allied Fibres (ICAR-CRIJAF), Barrackpore, observed Indian Constitution Day with great enthusiasm on 26th November 2025.

The programme began with Dr. Gouranga Kar, Director, ICAR-CRIJAF, leading the reading of the Constitution Day Pledge. All staff members, Research Associates, SRFs, Young Professionals, and students of the IARI-Kolkata Hub joined him in taking the pledge with sincerity and commitment.

Following the pledge, participants read out the Preamble of the Constitution online and downloaded their participation certificates as part of the nationwide observance.

The event reaffirmed our collective commitment to the ideals of justice, liberty, equality and fraternity enshrined in the Constitution of India.

Celebration of Rashtriya Ekta Diwas

ICAR-CRIJAF, Barrackpore celebrated Rashtriya Ekta Diwas on 31st October 2025 to pay tribute to Revered Sardar Vallabhbhai Patel, The Iron Man of India on his birth anniversary. At the onset of the programme, Dr. Gouranga Kar, Director of the institute delivered a speech on the significance of Rashtriya Ekta Diwas programme, the great contribution of Revered Sardar Patel in freedom movement and unification of princely state to build a sovereign country. He also said about the importance of unity in every spheres of life as well as in research activities through collaboration of different disciplines. After that, the "Ekta Diwas Pledge" was read out by the Director and all the staff members, RAs, SRFs, YPs and students of IARI-Kolkata Hub took the pledge along with him. The pledge taking ceremony was followed by a "Unity Walk" by all the participants surrounding the institute premises. Then, a short film on life, vision and contribution of Sardar Vallabhbhai Patel was screened at Institute Lecture Hall which was followed by screening of some videos on the theme "Ek Bharat, Shreshtha Bharat". Banner showcasing the portrait of Revered Sardar Patel was displayed at Institute campus as well as in big display screen at Institute Main Gate

Celebration of World Soil Day

ICAR-CRIJAF, Barrackpore celebrated World Soil Day on 5th December, 2025 on the theme, "Healthy Soils for Healthy Cities". Dr. Gouranga Kar, Director ICAR-CRIJAF delivered a key note address on the theme "Healthy Soils for Healthy Cities". Dr. Kar emphasized that healthy soils and availability of pure water can significantly contribute to end hunger and creating a healthy planet. In this occasion, 50 soil health cards were prepared and distributed to farmers in different villages of the North 24 Parganas district in West Bengal. The event witnessed by over 100 participants including 50 farmers, students of IARI Kolkata hub & scientists of ICAR-CRIJAF. Topics such as soil health, integrated nutrient management, soil salinization in India, and ecological and social concerns were thoughtfully addressed. On this occasion, a leaflet entitled "Healthy Soils, Developed Agriculture and Quality Life "(Sustho Mati, Samriddha Krishi o Unnata Jiban) was published. Besides that a video developed by ICAR-CRIJAF on Soil Sampling strategies, shown to the farming community.

Institute Research Council (IRC) meetings

The Institute Research Council (IRC) meetings at ICAR-CRIJAF in 2025, chaired by Dr. Gouranga Kar, convened on April 4 (IRC-I), July 29-30 (IRC-II), and September 19-22 (IRC-III) at Barrackpore, Kolkata, to advance jute and allied fibers research. All council members attended these sessions, which reviewed divisional achievements, ongoing projects, and new proposals while emphasizing ICAR reforms like competitive grants, IPR generation, high-impact publications, and demand-driven research on bioethanol, viscose pulp, mechanization, and genome editing.

Divisions showcased significant progress: Crop Improvement identified flax lines for AINP trials, low-pectin jute genotypes (e.g., SS-02 retting in 7 days), and stem rot-resistant lines; Crop Production

generated revenue through intercropping and Jute-ICARE outreach; Crop Protection advanced IPM modules. Precision irrigation studies boosted jute-rice-flax yields by 25-40%, water productivity by 37-44%, and reduced footprints (e.g., 1250 m^3/t for jute via SPK-50), validated via on-farm demos and AquaCrop modeling. Over 30 projects' progress was accepted, with several concluded (e.g., flax expansion, yield gap analysis showing 40-70% bridging via CRIJAF technologies), mandating data handover to PME as per ICAR policy.

New approvals included IRC-I's 8 projects (e.g., herbicide-tolerant jute breeding, jute harvester design, gender-sensitive ergonomics); IRC-II's low-lignin climate-resilient jute; and IRC-III's 4 (e.g., botanical pest formulations, stress-resilient jute/flax via growth regulators, sisal/flax farmer empowerment, climate-adaptive irrigation-nutrient strategies). The council stressed allied fibers (ramie, sisal, flax), project continuity, and one-scientist-one-product-one-IPR lists for certification.

Research Advisory Committee Meeting 22-23 December, 2025

The Research Advisory Committee (RAC) meeting was held during December 22-23, 2025 at ICAR-CRIJAF, Barackpore. Dr. Pradip C Deka, Chairman, RAC along with the members Dr. R.K. Singh, Dr. L.M. Garnayak, Dr. T Sreelata, Dr. A Bandyopadhyay, Dr. Sagar Mandal, Dr. Prashant K Dash, Dr. Gouranga Kar, Sh. Mahadev Sarkar, Dr. A. K. Mandal and Member Secretary, Dr. Sanjoy Saha attended the meeting at ICAR-CRIJAF, Barackpore. The HoDs of Crop Improvement Division, Crop Production Division and Crop Protection Division presented the salient achievements of respective Division. The committee discussed in details the research activities of the Institute for the period of December 2024 to November 2025. The committee was satisfied with the Action Taken Report presented in the meeting. The RAC made twelve specific recommendations. The meeting resulted in recommendation for further strengthening of the research activities of the Institute with emphasis on mitigating the climate resilience including biotic and abiotic stress , Sensor-based smart farming' in jute general and new age fibre in particular rand allied fibres

National Farmers' Day

ICAR–CRIJAF organized National Farmers' Day on 23 December 2025 at Sundarban, West Bengal, to commemorate the birth anniversary of Bharat Ratna Chaudhary Charan Singh and to strengthen farmer-centric development initiatives in the region. Prof. P. C. Deka, Former Vice Chancellor, Tezpur University and Chairman, RAC, ICAR-CRIJAF, graced the occasion as Chief Guest. Several eminent dignitaries from ICAR and agricultural universities, along with Mr. Lokman Molla of Kultali Milan Tirtha Society, participated with 1,600 farmers and farm women The programme aimed to create awareness among farmers and farm women about the Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) Bill, 2025, while motivating them to adopt improved agricultural practices and alternative livelihood options to enhance livelihood security in the climate-vulnerable Sundarban region.

PUBLICATION

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Aruna, C., Meena, K., Visarada, K. B. R. S., Hariprasanna, K., Deepika, C., Venkateswarlu, R., Das, I. K., Madhusudhana, R., & Satyavathi, C. T. (2025). Red sorghum variety: A dual solution for functional food and grain mold resistance. *Journal of Cereal Science, 123*, 104150.

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POPULAR ARTICLE

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MANUALS

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EXTENSION / TECHNICAL BULLETIN

Singh, A.K., Majumdar B., Jha, S.K. and Kar, G. (2025) Soil-climate-water in jute growing areas of India Technical Bulletin (1/2025) ICAR- Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata, p. 50

EXTENSION FOLDER

Ghosh, S., Alam, N. M., Datta, D., Shamna, A., Mandal, K., Satpathy, Mitra, S., S., Saha, S. and Kar, G. (Eds.) 2025. In Bengali: *Drone O Sprinkler Prajuktite Unnato Fasal O Jol Byabostapona*. Extension folder No – 1/2025, ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata 700121

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KNOWLEDGE MANAGEMENT & TECHNOLOGY COMMERCIALIZATION

CRIJAF Library: Information and Documentation Unit

Library continued its support for research activities of the institute by subscribing to electronic resources and providing various information services of all kinds of scientific and technical information on jute and allied fibres like mesta, ramie, sisal, sunnhemp and flax.

Virtual library through CeRA platform: Library continued to provide this service to enable users to access subscribed from a single portal, irrespective of place and time. It helps a lot to users especially during Covid-19 pandemic lockdown period.

Scientific books: Presently, it holds about 9895 books under various themes of agriculture and allied sectors like agronomy, soil science, genetics & plant breeding, plant pathology, agricultural entomology, agricultural extension, plant physiology, bio-technology, agricultural engineering, etc. from national and international publishers. Besides, library also procured general books like stories, economics and politics in Hindi, English and Bangla languages.

Scientific journals: The library is enriched with 39 International and 106 Indian journals and digital version of international bibliographic information system for the agricultural sciences and technology (AGRIS).

The library has about 9230 bound volumes of journals and scientific literatures since 1947.

Annual reports: To keep abreast of the activities of the Institute, the library sends the Annual Reports, Newsletters (JAF news) and Technical bulletins of ICAR-CRIJAF to various research organizations including Universities and Developmental Departments of the States. Library also holds the annual reports/newsletters/technical bulletins of various ICAR Institutes and SAU's, Commission/Committee reports.

Software support for library information: An open source library management software (KOHA) installed and database management of library books.

Digitization of documents: Library started digitization of all kinds of scientific and technical information of the institute.

Reprographic and photographic facility: This facility met photography, photocopying and printing requirements of the institute for the research and administrative purposes of the institute.

Exhibition-cum-Fibre Museum: To showcase ICAR-CRIJAF technologies on fibre and fibre based products, anexhibition-cum-fibre museum has been established.

AWARDS, FELLOWSHIPS & RECOGNITIONS

- संघ की राजभाषा नीति के उत्कृष्ट कार्यान्वयन तथा राजभाषा के प्रगामी प्रयोग हेतु वर्ष 2024-25 के लिए संस्थान को “द्वितीय” क्षेत्रीय राजभाषा पुरस्कार प्राप्त हुआ है।
- Dr. Sanjoy Saha received 'ISCAR Fellow Award' in recognition of pioneering contribution and dynamic leadership in research & planning for augmenting agricultural production of India and the coastal areas in particular during 14th National Symposium on Coastal Agriculture, 28 Feb to 3 Mar, 2025 at ICAR-CRIJAF, Barrackpore.
- Dr. D. Barman received 'Best Poster Award' for the paper “Jute Climet and Climate Expert on Jute - ICT based decision support system for weather-based agroadvisory on jute production” by Barman D., Saha R., Banik D. and Kar G., 2025. in 14th National Symposium on Coastal Agriculture, 28 Feb to 3 Mar, 2025 at ICAR-CRIJAF, Barrackpore.
- Dr. D. Datta received 'ISCAR Best Paper Presentation Award for Early Career Researcher 2025' during National Symposium on Coastal Agriculture at ICAR-CRIJAF, Barrackpore.
- Dr. D. Datta received 'Best oral presentation award' on “Water efficient jute farming: Integrating deficit irrigation and modelling for enhanced productivity and mitigating dry spell” by D. Datta, A.K. Singh, S. Ghosh, D. Barman, N.M. Alam, R.K. Naik, G. Kar during National Symposium on Coastal Agriculture at ICAR-CRIJAF, Barrackpore.
- Dr. S. Ghosh received 'Best oral presentation award' on “Precision irrigation scheduling for augmenting yield, resource use efficiency and water productivity in jute based cropping system by S. Ghosh, G. Kar, S. Mitra, A.K. Singh, T. Samajdar, R.K. Naik, D. Barman, S. Saha, D. Datta, S. Nanda during National Symposium on Coastal Agriculture at ICAR-CRIJAF, Barrackpore.
- Dr. Lavanya A.K. received the 'Best paper presentation Award' for the paper “Bacillus sp. strain MRD-17 volatiles improve mustard (Brassica juncea L.) seedling growth and enhance tolerance to nutrient and osmotic stress” by A. K. Lavanya, Koli Bhavya, Aditi Kundu, G. Abraham, Viswanathan Chinnusamy, J. C. Padaria, Sangeeta Paul in International conference on “Global research initiative for agriculture, Science and technology” (GRIAST-2025) held during 20 to 22 January 2025.
- Dr. Shamna A received 'Best oral presentation award' for the paper on value chain in jute for technological and economic empowerment of farm families, by Shamna, A, Jha, S.K Mazumdar,S.P, R.K. Naik,N.M. Alam and G. Kar during National Symposium on Coastal Agriculture at ICAR-CRIJAF, Barrackpore during Feb 28 to 3rd March 2025.
- Dr. R. K. Naik received 'Best oral presentation award' on “Development of improved farm machinery for jute farming” by Naik, R.K., Kar, C.S., Kar G., Mitra, S. and Jha S.K. in the National Symposium on Coastal Agriculture held at ICAR-CRIJAF, Barrackpore during 28 Feb-3 March, 2025.

DISTINGUISHED VISITORS

Sl. No.	Date	Name	Designation
1	01/01/25	Sri Giriraj Singh	Hon' ble Union Minister of Textile, Govt. of India
2	17/01/25	Dr. Vinod Kumar Singh	Director, ICAR-CRIDA, Hyderabad
3	17/01/25	Dr. Partha Roy Choudhary	Pr. Scientist, ICAR, New Delhi
4	17/01/25	Prof. Pintu Bandyopadhy	Professor in Agronomy, BCKV, Mohanpur
6	23/01/25	Dr. T.R. Sharma	DDG (CS), ICAR, New Delhi
7	10/02/25	Dr. Ashoka Patra	Hon'ble VC, BCKV, Mohanpur, W.B.
8	24/02/25	Shantanu Thakur	Hon'ble MoS for Ports, Shipping, Waterways, Govt. of India
9	28/01/25	Dr. R. K. Yadav	Director ICAR-CSSRI, Karnal
10	01/03/25	P.K. Ghosh	Director, ICAR NIBSM, Raipur
11	01/03/25	Mohammad Mainuddin	CSIRO, Canberra, Australia
12	01/03/25	Dr. Manish Das	Director, ICAR-DMAPR, Anand, Gujaart
14	18/03/25	Dr. Sanjay Kumar	Director, ICAR-NISST, Mau
15	26/04/25	Padmini Singh	IAS, Jt. Secretary, Ministry of Textile, Govt. of India
16	26/04/25	Lalit Kumar Gupta	CMD, Cotton Corporation Limited, Mumbai
17	28/04/25	Major Singh	Member, ASRB, New Delhi
18	28/04/25	R.K. Singh	Dean, R.L.B.C.A.U. Jhansi
19	11/06/25	Prof. A.K. Sarial	Former Vice-Chancellor, CSKHPKR, Palampur
20	18/06/25	Dr. T.K. Datta	Vice Chancellor, WBUAFS, Kolkata
21	03/07/25	Kanika Sood	Director, Vijaya Wellness & Bioscience
23	28/07/25	Prof. Sudip Mitra	IIT Guwahati
24	09/10/25	Dr. Tapas K Biswas	CSIRO, Australia
26	11/10/25	Dr. Sukanta Majumdar	Hon'ble MoS, DONER & Education, Govt. of India

RESEARCH PROJECTS

Externally Funded Projects

	Project Title	Investigators	Funding Agency	Duration
1	Genome sequencing and functional genomics of bast fibre quality	D. Sarkar	ICAR-NPFGGM-3070	2021-26
2	Prospecting heat stress tolerance through genome-edited heat shock factors and NAC-domain transcription factors in flax (*Linum usitatissimum*)	D. Saha	CRG/2021/001317	2022-25
3	Enhancing climate resilience and ensuring food security with genome editing tools	S. Datta	ICAR-CS-EFC scheme	2024-26
4	In-season smart sensor enabled advanced technological Interventions for real time water management of jute crop for adaption in SC farmers field under changing climate scenario	A. K. Singh	DST-SEED	2023-26
5	Jute- improved cultivation and advanced retting exercise (JUTE-ICARE)	B. Majumdar	NJB	2015-26
6	Assessment of vulnerability of jute production to climate change and its mitigation strategies development using remote sensing GIS in West Bengal	D. Barman	STBT-ST SE	2018-25
7	Quantitative assessment of carbon and moisture fluxes over jute based agro-ecosystems: integrating ground observations, satellite data and modeling	D. Barman	ISRO-NCP	2018-25
8	Development of minimal water retting technology in jute	B. Majumdar	NASF/FME-9022/2022-23	2022-25
9	IP Facilitation centre under MSME	C. Biswas	TD-IPR-DCMSME	2023-25
10	Technologic and economic empowerment of sc farm families to mitigate the impact of COVID-19 through jute fiber based farming, value addition and value chain establishment	Shamna A.	DST-SEED	2021-24
11	Commercial crops jute-based cropping system	C. S. Kar	NFSM-CC	2015-Long Term
12	AICRP on seeds (crops)	C. S. Kar	AICRP (Seeds)	2000-Long Term
13	Protection of jute varieties and DUS testing in jute	A. Bera	PPV& FRA	2005-Long Term
14	Development of descriptors for DUS testing of mesta (Kenaf and Roselle)	A. Bera	PPV&FRA	2019-Long Term
15	To study changes in soil quality, crop productivity and sustainability under jute-rice-wheat cropping system	B. Majumdar	AICRP-LTFE	1971-Long-Term
16.	Soil test and resource based integrated plant nutrient supply system for sustainable agriculture	S.P. Mazumdar	AICRP-STCR	2007-Long-Term
17.	Comparative Pan-genome analysis of Indian and global Flax genepool to delineate functional fibre and nutritional quality genes	Dr. D. Saha	ANRF	2025- 2028
18.	Estimation of chemical quality parameters of Cinchona, Jute and allied Fibres and Lac by fluorescence and NIR sensors and development of Portable sensor instruments with thrust on fluorimeter	Dr. P Satya	NASF	2024 -2027

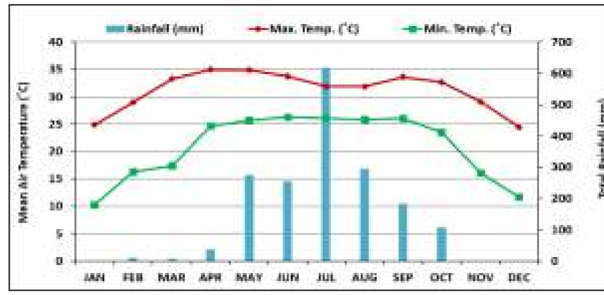
Institute Projects

	Project Title	Investigators	Duration
Crop Improvement			
1.	Introduction, maintenance, characterization and conservation of jute and allied fibres germplasm	JibanMitra	Long-Term
2.	Genetic improvement of flax (Linumusitatissimum) for higher fibre productivity and fibre quality	JibanMitra	2016-2025
3.	Maximising fibre productivity in jute through genetic and agronomical approaches	K. N. Chourasia	2020-2025
4.	In vitro regeneration and haploidy induction in jute	S. Datta	2022-2027
5.	Molecular mapping for stem rot resistance in jute	K. Meena	2022-2027
6.	Pre-breeding and breeding approaches for developing major biotic stress resistance in jute	J. K. Meena	2021-2026
7.	Introgression of low pectin content into high-yielding jute varieties	J. K. Meena	2020-2025
8.	Genetic enhancement of fibre quality traits in tossa jute (Corchorusolitorius)	Thribhuvan R	2021-2026
9.	Maximization of seed yield of sunnhemp in Gangetic alluvial Zone	A. Bera	2024-2027
10	Development of low lignin climate resilient jute lines.	P. Satya	2025-2030
11	Towards Breeding for Herbicide Tolerance in Jute (Corchorusolitorius)	K.N. Chourasia	2025-2030
12	QTL Mapping for Premature Flowering Tolerance in Tossa Jute (Corchorusolitorius)	Tribhuvan R.	2025-2030
13	Promoting newly released jute varieties in farmers' fields and exploring theirseed production potential in West Bengal	S. Kumar	2025-2028
Crop Production			
14	Assessing the role of microbes in jute from seed to fibre	Lavanya, A. K.	2021-2025
15	Leaf litter management: decomposition and nutrient dynamics of leaf litter composts and its effects on JAF crops	A. K. Singh	2020-2025
16	Standardization of organic and natural agricultural practices for jute-based agro-ecosystem	S. P. Mazumdar	2022-2026
17	Precision irrigation scheduling for augmenting yield, resource-use efficiency and water productivity in jute-based cropping systems	S. Ghosh	2022-2025
18	Water management strategies for profitable and sustainable jute cultivation under rainfed and irrigated ecosystems	D. Datta	2022-2025
19	Farm mechanization for efficient sowing and fibre extraction for jute and allied fibre	R. K. Naik	2022-2025
20	Effect of jute phonologicalstages on waterlogging toleranceand quality of leaf based byproducts	PandurangDivte K N Chourasia	(2024-2027)
21	Analysis of yield gap and contribution of production factors in cultivation of jute	S. K. Jha	2020-2025
22	Assessing Role of Plant Growth Regulators and Source of Plant Nutrients todevelop Stress Resilience in Jute and Flax and Fibre Output	D.Datta	2025-2028
23	Design and development of jute harvester	R.K. Naik	(2025-2027)
24	High quality viscous fibres and eco-friendly paper pulp production from jute &kenaf biomass	R.K. Naik	(2025-2027)
25	Developing a gender sensitive ergonomic model in jute cultivation with aspecial emphasis on farm women empowerment	Shamna .A	(2025-2028)
Crop Protection			
26	Identification of donor lines for resistance against stem rot and anthracnose diseases in jute	S.K. Sarkar	2021-2025
27	Development of IPM module in mesta	R. K. De	2021-2025
28	Monitoring and assessment of insecticide resistance against stem rot and anthracnose diseases in jute	V. Ramesh Babu	2023-2026
29	Minimizing yield gap and maximizing the income of jute-based farm families through cluster-based approach-a case study	M. L. Roy	2022-2025
30	Technological empowerment of farmers regarding sisal and flax cultivation in North 24 parganas district of W.B	M. L. Roy	2025-2029
31	Integration of promising technologies for management of insect pests of jute in on-farm jute production system	S.Satpathy	2025-2028
32	Philosophy of charcoal-rot disease development with respect to jute	K. Mandal	2025-2028
33	AI based detection and forecasting of stem rot diseases in jute	C. Biswas	2024 2027
AINP-JAF			
34.	Expansion of Flax Area in Pilot Scale with Improved Technologies	S Mitra	2020-2025
35	Risk assessment through modelling of major pests and diseases of jute under climate change scenario in India	N. M. Alam	2020-2025

Weather Report 2025

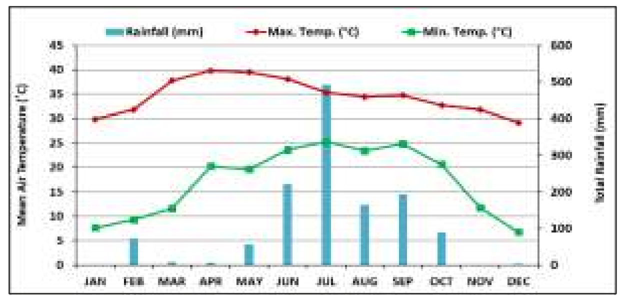
ICAR-CRIJAF, Barrackpore (West Bengal)

Total annual rainfall:	1789.3 mm
Annual mean maximum air temperatures:	31.2 °C
Annual mean minimum air temperatures:	20.8 °C
Hottest Month: April	35.0 °C
Coldest Month: December	10.3 °C
The highest monthly total rainfall: August	618.5 mm
The lowest monthly total rainfall: November	6.2 mm
No rainfall in months: Jan, Nov, Dec	



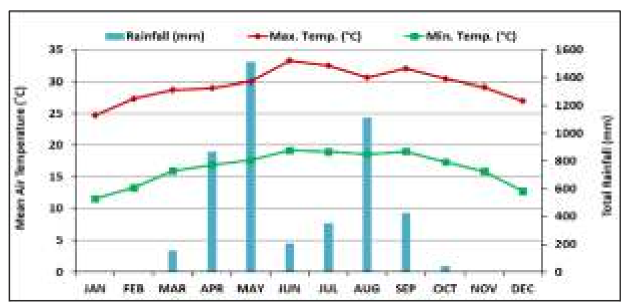
CSRFJAF, Budbud (West Bengal)

Total annual rainfall:	1305.5 mm
Annual mean maximum air temperatures:	34.6 °C
Annual mean minimum air temperatures:	17.0 °C
Hottest Month: April	39.0 °C
Coldest Month: January	6.7 °C
The highest monthly total rainfall: July	491.5mm
The lowest monthly total rainfall: Dec	3.5 mm
No rainfall in months: Jan, Nov	



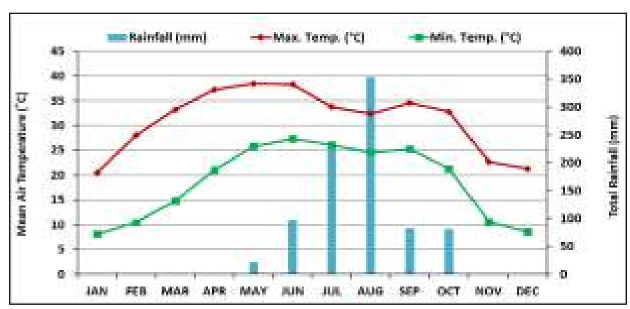
RRS, Sorbhog (Assam)

Total annual rainfall:	4668.0 mm
Annual mean maximum air temperatures:	29.6°C
Annual mean minimum air temperatures:	16.4°C
Hottest Month: June	33.3°C
Coldest Month:January	11.5°C
The highest monthly total rainfall: June	1512.0 mm
The lowest monthly total rainfall: October	41.0 mm
No rainfall in months: Jan, Feb, Nov, Dec.	



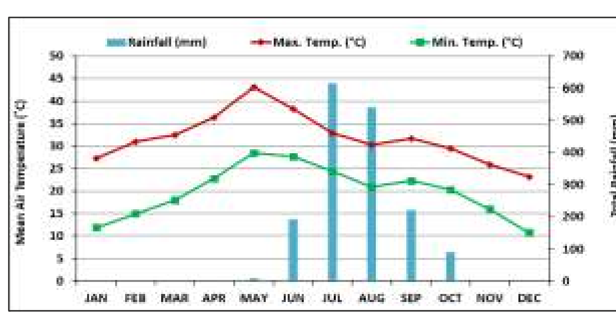
ShRS, Pratapgarh (Uttar Pradesh)

Total annual rainfall:	873.8 mm
Annual mean maximum air temperatures:	31.1 °C
Annual mean minimum air temperatures:	18.6 °C
Hottest Month: May	38.4 °C
Coldest Month: January	8.1 °C
The highest monthly total rainfall: September	353.0mm
The lowest monthly total rainfall: January	3.0 mm
No rainfall in months: Apr, May, Oct, Nov	



SRS, Bamra (Odisha)

Total annual rainfall:	1664.2 mm
Annual mean maximum air temperatures:	31.8 °C
Annual mean minimum air temperatures:	19.9 °C
Hottest Month:May	43.1 °C
Coldest Month: December	10.7 °C
The highest monthly total rainfall: July	614.2 °C
The lowest monthly total rainfall: May	8.6 mm
No rainfall in months: Jan, Feb,Mar, Apr. Nov, Dec	



(Source: D. Barman, In-Charge, Agrometeorology Unit, ICAR-CRIJAF H.Q.and Regional Stations)

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10	Shri Joydeep Pal	Driver/ Sr. Technical Assistant	joydeep.pal@icar.org.in

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3.	Mr. V. Om Subham Raju	SMS (Agronomy)/ T-6	rajusubham.raju6@gmail.com vos.raju@icar.org.in
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6.	Mr. Syam K.R.	SMS (Fishery Sc.)/ T-6	syamkaduvetty@gmail.com syam.kr@icar.org.in

Skilled Supporting Staff

Sl.No.	Name	Designation
1.	Smt. Laxmi Bansfore	Skilled Support Staff
2.	Shri Sugriva	Skilled Support Staff
3.	Smt. Fulmani	Skilled Support Staff
4.	Shri Nelson	Skilled Support Staff
5.	Shri Jawahar	Skilled Support Staff
6.	Shri Ram Raj Pal	Skilled Support Staff
7.	Shri Jokhu	Skilled Support Staff
8.	Shri Jagdish Singh	Skilled Support Staff
9.	Shri Mahesh Singh Verma	Skilled Support Staff
10.	Shri Bhuwal Pal	Skilled Support Staff
11.	Shri Ram Bhajan Saroj	Skilled Support Staff
12.	Shri Ram Baran Yadav	Skilled Support Staff
13.	Shri Shyamal Bhanja	Skilled Support Staff
14.	Shri Anup Das	Skilled Support Staff

PERSONNEL, TRANSFERS, NEW JOINING, SUPERANNUATION, RESIGNATION AND PROMOTIONS

1) TRANSFER FROM ICAR-CRIJAF, BARRACKPORE DURING 1st JAN- 31st DEC 2025:

Sl.	Name of the Person	Designation	Date (w.e.f.)
01.	Shri Shahid Mukhtar	Sr. Technical Officer (T-6)	Transferred to ICAR-NBSS&LUP, Regional Centre, Kolkata on 31.03.2025 (A/N)
02.	Shri Avishek Barua	UDC	Transferred to ICAR-IVRI Campus, Mukteshwar on 13.06.2025 (A/N)
03.	Dr. Lavanya A.K	Scientist	Transferred to ICAR-NRCG, Pune on 29.10.2025 (A/N)
04.	Shri Ravi Mishra	AO	Transferred to ICAR-NINFET, Kolkata, on 31.12.2025 (A/N)

2.TRANSFER TO ICAR-CRIJAF, BARRACKPORE DURING 1st JAN-31st DEC 2024:

Sl.	Name of the Person	Designation	Date (w.e.f.)
01.	Dr. Tarun Adak	Sr. Scientist	30.01.2025 (F/N)
02.	Dr. Sandip Patra	Sr. Scientist	29.04.2025(F/N)

3.NEW JOINING AT ICAR-CRIJAF, BARRACKPORE DURING 1st JAN-31st DEC 2025:

Sl.	Name of the Person	Designation	Date of joining (w.e.f.)
1.	Mrs. Ritwika Majumdar	Assistant	04.03.2025 (F/N)
2.	Shri Souvick Pramanick	Technical Trainee (T-1)	30.01.2025(F/N)
3.	Shri Pratik Sagar	Technical Trainee (T-1)	03.02.2025(F/N)
4.	Shri Ankit Kumar	Technical Trainee (T-1)	03.02.2025(F/N)

4.SUPERANNUATION, RESIGNATION FROM ICAR-CRIJAF, BARRACKPORE DURING JAN- 31st DEC 2025:

Sl.	Name of the Person	Designation	Date (w.e.f.)
01.	Dr. Debabrata Sarkar	Pr. Scientist	31.10.2025 (A/N)
02.	Sri Sadabriksha Rajbansi	SSS	31.03.2025 (A/N)
03.	Sri Lachindra Bhainsa	SSS	31.05.2025 N)

5.PROMOTION ORDERS ISSUED DURING THE YEAR 2025:-

Sl.	Name of the Person	Designation	Date (w.e.f.)
Scientific			
01.	Dr. V. Ramesh Babu	Sr. Scientist	Promoted to Sr. Scientist RGP Rs.9000/-/Level-13Aw.e.f. 15.09.2023
02.	Dr. Sourav Ghosh	Scientist	Promoted to Scientist RGP Rs.7000/-/Level-11 w.e.f. 04.01.2023
03.	Dr. Debarati Datta	Scientist	Promoted to Scientist RGP Rs.7000/-/Level-11 w.e.f. 07.01.2024
Technical			
01.	Mr. Vikash Kumar Keshari	Sr. Technical Assistant	Promoted to TO w.e.f. 26.03.2025
02.	Mr. Laxman Pradhan	Technical Assistant	Promoted to STA w.e.f. 17.01.2023
Administrative			
01.	Mrs. Neena Mandal	Personal Assistant	Promoted to PS w.e.f. 01.01.2025
02.	Mr. Sushanta Dey	Personal Assistant	Promoted to PS w.e.f. 01.01.2025

भाकृअनुप
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