

# CRIJAF BULLETIN

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## DIRECTOR'S MESSAGE

Greetings !

The ICAR-Central Research Institute for Jute and Allied Fibres (ICAR-CRIJAF) has made remarkable strides in advancing research and development for jute and allied fibre crops from July to December 2024. Through close collaboration between the institute's expert scientists, dedicated extension specialists, and hardworking farmers, ICAR-CRIJAF has developed and disseminated cutting-edge technologies which have a profound positive impact on the productivity, quality, and profitability of these important crops. Innovative solutions spanning the domains of crop improvement, production practices, and crop protection measures have been successfully adopted by farmers in jute growing regions, resulting in measurable enhancements to yields, fibre attributes, and financial returns. ICAR-CRIJAF's achievements have earned recognition and endorsement from important stakeholder such as the National Jute Board, Jute Corporation of India, and state agriculture departments. Beyond on-farm interventions, the institute also conducts critical capacity building programs for Self Help Groups engaged in jute-based handicrafts and value-added products, empowering participants with the skills and knowledge to boost their off-farm incomes. The far-reaching success of ICAR-CRIJAF's endeavours would not be possible without the steadfast support and trust of its valued stakeholders and the diligent efforts of the farmers who form the backbone of the jute and allied fibre sector. In particular, the institute is deeply grateful for the invaluable guidance provided by Dr. Himanshu Pathak, Secretary, DARE, Gol and Director General ICAR, Dr. T.R. Sharma, and Dr. D.K. Jadav DDG (CS), and Dr. Prasanta Dash, ADG (CC). Heartfelt appreciation is also extended to the tireless effort of editorial team and the scientists of ICAR-CRIJAF, whose dedication has ensured the timely publication of this insightful bulletin showcasing the institute's momentous progress.



## RESEARCH NOTES

### White Jute variety JRC-9 (NAMITA)

A new white jute variety, JRC 9 (Namita), developed at ICAR-Central Research Institute for Jute and Allied Fibre, Barrackpore, Kolkata was formally released by Hon'ble Prime Minister on 11 August 2024 as one of the 100 climate-smart crop varieties and was notified vide Gazette Notification No. S.O. 4388(E) 08.10.2024. It was registered at ICAR-NBPGR with registration no. IC 651434. JRC 9 was developed using a backcross-pedigree breeding method. The donor parent for tolerance to stem rot was CP-23, a resistant line selected from germplasm accession CIM-036. It was crossed with popular high yielding variety JRC-517. This variety may be promising to improve the area of white jute in the country due to its high fibre yield potential under changing climate scenario. It is a climate smart variety with high disease-pest and waterlogging tolerance coupled with high fibre yield and fine fibre.



Fig. 1. Field view of JRC-9 (Namita)

P. Satya, S. K. Pandey and Suman Roy  
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### Substitution of mineral fertilizer with organic compost to improve soil organic carbon and crop yield

A three-year field experiment was conducted to compare four different treatments - a 100% NPK mineral fertilizer ( $F_{100}$ ), a 50/50 mix of mineral and compost fertilizers ( $F_{50}$ ), a 100% compost treatment ( $F_c$ ), and a control with no fertilizer application ( $F_0$ ) for jute and flax fibre crops. Compared to the  $F_{100}$  treatment, the  $F_c$  and  $F_{50}$  treatments significantly increased total SOC content by 20–24%. The compost-based

treatments also had the highest carbon pool management index (CPMI). Importantly, the  $F_{50}$  treatment actually had a higher soil organic carbon sequestration rates compared to the  $F_c$  (Fig. 2). At the same time, the compost treatments maintained jute and flax fibre yields compared to the mineral fertilizer benchmark. This study has also shown that the specific impacts of compost application on SOC can vary considerably depending on the climate change scenario under RCP4.5 and RCP8.5. These findings demonstrate the potential of compost application to enhance soil carbon storage, a crucial ecosystem service for climate change mitigation.

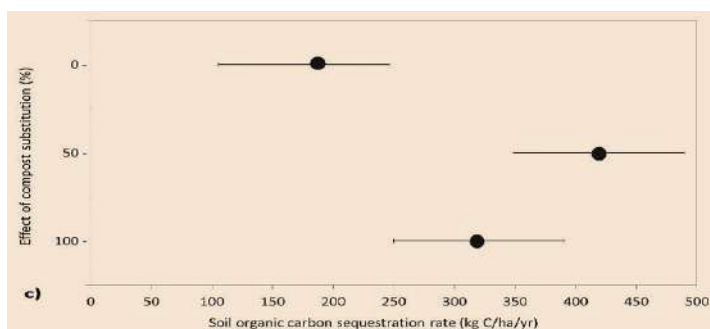


Fig. 2. Effects of compost substitution on soil organic carbon sequestration rate for jute and flax production

A.K. Singh, S. Mitra, B. Majumdar, S. Satpathy, S.K. Sarkar and G. Kar  
ICAR-CRIJAF, Barrackpore

### Precision irrigation for maximizing resource-use efficiency in jute-rice-flax cropping systems

Sprinkler irrigation in jute-rice-flax cropping system was evaluated for energy budgeting. The treatments included sprinkler irrigation at 50% DASM (SPK 50 DASM), sprinkler irrigation at 75% DASM (SPK 75 DASM), surface irrigation at 75% DASM (SUR 75 DASM), and a control with one post-sowing irrigation. Sprinkler irrigation at 50% DASM required approximately 175% more irrigation energy than the control but used lower energy inputs compared to surface irrigation at 75% DASM. Sprinkler irrigation at 75% DASM further reduced irrigation energy input by about 20% compared to surface irrigation (Fig. 3a).

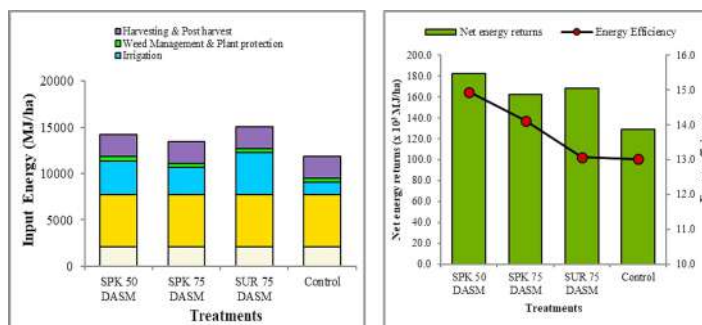


Fig. 3. a. Operation wise input energy in jute, b. Net energy returns and energy efficiency in jute

Energy efficiency, a measure of output energy relative to input energy, was highest in SPK 50 DASM, showing an increase of over 15% compared to the control. SPK 75 DASM and SUR 75 DASM also demonstrated improved efficiency, though to a lesser extent, with increases of 8% and 4%, respectively, over the control. Net energy returns followed a similar trend. SPK 50 DASM achieved the highest net returns, registering an increase of more than 40% over the control. SUR 75 DASM also showed a 30% increase, while SPK 75 DASM recorded a slightly lower increase of 25% compared to the control. The results emphasize the effectiveness of sprinkler irrigation, particularly at 50% DASM, in maximizing energy gains (Fig. 3b).

S. Ghosh, G. Kar, S. Mitra, A.K. Singh, T. Samajdar,  
R.K. Naik and D. Barman  
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### Quantification of CO<sub>2</sub> and energy balance fluxes in jute-rice cropping system using eddy covariance technique

A study was conducted to estimate the ecosystem-level CO<sub>2</sub> exchanges at diurnal, daily, and seasonal scales from jute and rice crop fields in the alluvial soil under a tropical hot and moist sub-humid climate in the year 2024 using an open-path eddy covariance technique. At the five different growth stages, viz. germination (1-6 DAS, days after sowing), seedling (7-36 DAS), active vegetative (37-66 DAS), fibre development (67-96 DAS), and maturity (97-114 DAS) stages, the daily mean net ecosystem exchanges of CO<sub>2</sub> (NEE) of the jute crop were found to be 2.03, -0.29, -3.55, -3.15, and -3.51 gC/m<sup>2</sup>/day, respectively. The seasonal cumulative NEE from the jute field was found to be -260.7 gC/m<sup>2</sup>. At the six different phenological stages, viz. vegetative (1-18 DAS), tillering to panicle initiation (19-40 DAS), reproductive stage (41-53 DAS), heading to flowering (54-73 DAS), ripening (74-86 DAS), and maturity (87-96 DAS), the daily mean NEEs of the rice crop were found to be -0.48, -1.55, -4.73, -2.97, -1.96, and -1.83 gC/m<sup>2</sup>/day, respectively. The seasonal cumulative NEE from the rice field was found to be -207.4 gC/m<sup>2</sup>. The jute and rice ecosystems were found to be net carbon sinks (Fig. 4).

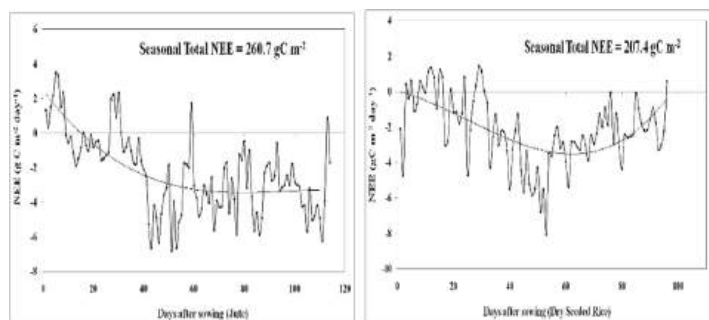


Fig. 4. Net ecosystem exchanges of CO<sub>2</sub> from jute and rice ecosystems

D. Barman, A. Chakraborty and G. Kar  
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### Risk Assessment through modelling of major pests and diseases of jute under climate change scenario in India

A forecasting model for BHC infestation was developed using an Artificial Neural Network (ANN), specifically a Multilayer Perceptron (MLP) with one hidden layer comprising four neurons and a hyperbolic activation function. The ANN model demonstrated superior performance compared to a simple regression model. Hybrid models combining linear approaches (ARIMAX) and machine learning methods (SVM and ANN) were also employed for forecasting BHC infestation. Among these, the hybrid ARIMAX and Support Vector Machine (SVM) model outperformed the hybrid ARIMAX and ANN model. The life cycle modeling of mealybug was conducted using temperature as an explanatory variable. The development rate and mortality of mealybug were estimated using the Logan and Janisch models, respectively. It was observed that the optimal temperature for development was 34–35°C, while the lowest mortality occurred at 33°C. Forecast models based on the weather parameters as independent variables was developed to forecast highest population of yellow mite, jute semi-loopers and Bihar hairy caterpillar at each week starting from week of sowing by multiple stepwise regression.

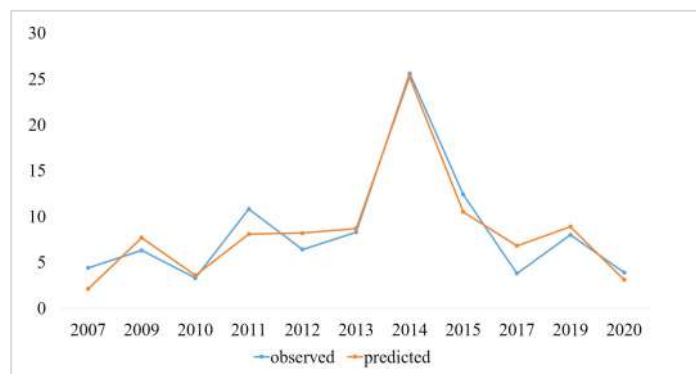


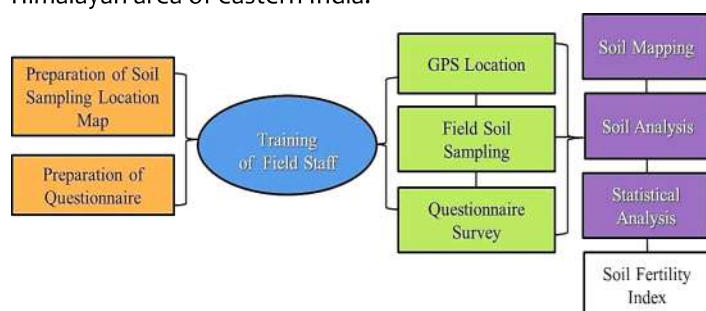
Fig. 5. Highest population of yellow mite on jute per sq cm at Coochbehar

N.M. Alam, D. Barman, S. Satpathy, S. Mitra,  
S.K. Sarkar and C. Chattopadhyay  
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### Soil-water-related ecosystem services in jute growing in West Bengal

Under the Jute-ICARE project, an extensive analysis of soil samples were collected from jute farmers' fields across multiple jute-growing districts in West Bengal. The goal was to generate detailed spatial soil fertility maps that provide a comprehensive picture of the soil health and nutrient levels in these regions (Fig. 6). To achieve this, a multi-faceted approach that closely examined four critical ecosystem indicators: soil fertility, nutrient delivery ratio, carbon storage capacity, and water footprints was employed. The study's

findings clearly showed a worrying trend of declining soil fertility, as evidenced by decreasing nutrient index values (NIV) across many of the sampled locations. However as per results of improved soil-crop management practices of ICAR-CRIJAF, it may be possible to optimize nutrient availability and ensure more sustainable crop yields in these economically important districts of the Gangetic Plains and the northern Sub-Himalayan area of eastern India.



**Fig. 6.** Methodological flowchart for the study for soil-water-related ecosystem services

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### Development of a minimal water retting system for jute

Free flowing retting method was evaluated compared to stagnant water retting in concrete retting tank, *in-situ* retting and conventional retting methods. The free flowing water retting method required only 7135 litres of water for 1 quintal dry jute fibre production compared to 25,840 litres in conventional retting method. The fibre recovery in free flowing water retting method was significantly higher by 7.5, 6.0 and 22.4% respectively, over stagnant water retting in concrete retting tank, *in-situ* retting and conventional retting methods. Use of microbial retting consortium (CRIJAF SONA) accelerated the retting process and reduced the retting duration by 6-10 days along with improvement in fibre quality parameters. The higher fibre strength of 26.5 g/tex, the lowest root content (2.3%) and defects content (0.55%) of jute fibre obtained under free flowing water retting method suggests its supremacy over other retting methods under study.

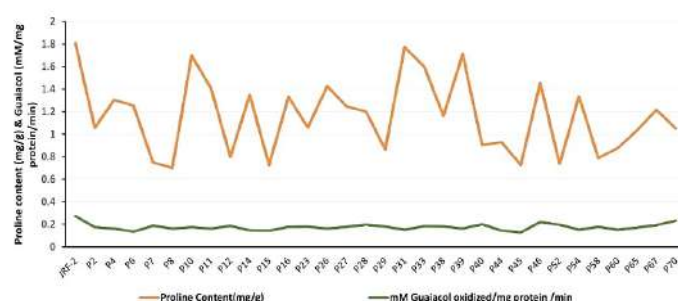
**Table 1.** Water requirement, retting duration and jute fibre yield under different jute retting methods

| Sl.         | Retting method                         | Retting duration (days) | Fibre yield (q/ha) | Plant: water ratio |
|-------------|----------------------------------------|-------------------------|--------------------|--------------------|
| 1.          | Free flowing water retting             | 10                      | 35.5               | 1:6.7              |
| 2.          | Stagnant water retting (concrete tank) | 14                      | 33.0               | 1:9.8              |
| 3.          | In-situ retting                        | 13                      | 33.5               | 1:11.3             |
| 4.          | Conventional retting                   | 20                      | 29.0               | 1:20.0             |
| CD (p=0.05) |                                        | 2.4                     | 1.85               | -                  |

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### Genetic improvement of flax for higher productivity

An evaluation of 12 F<sub>6</sub> lines from seven cross was done during Rabi 2023-24. Based on promising traits such as tallness, reduced axillary branches, late flowering and fibre yields, six lines were selected. Consequently a total of six lines are being evaluated in station trial with check JRF 2 in the current Rabi season 2024-25. A total of 357 germplasm lines including 90 exotic accession are under the maintenance breeding. Proline and oxidized guaiacol of 32 selected F<sub>6</sub> flax lines of the B<sub>3</sub> cross (EC852234 x EC852264) was also estimated. Proline content is positively correlated to stress tolerance in plants by maintaining cell turgor and osmotic balance. On the other hand, the oxidized guaiacol functions as a marker for the activities of the guaiacol peroxidase enzyme (GPX), which is activated by abiotic stresses like high temperatures that produce harmful reactive oxygen species (ROS). GPX is involved in eliminating H<sub>2</sub>O<sub>2</sub> in cells that serve as one of the tolerance mechanisms to plant stress. The proline content varied from 0.701 to 1.772 mg/g in B<sub>3</sub> plant lines compared to 1.808 mg/g in JRF-2. The range of oxidized guaiacol content (mM per mg protein / min) varied from 0.129 to 0.232 in B<sub>3</sub> plant lines, while JRF-2 showed 0.274 (Fig. 7). Previously, based on malondialdehyde (MDA) assay, JRF-2 was shown to be tolerant to heat stress-induced oxidative stress, which was further substantiated through proline content and oxidized guaiacol estimations. Some of the B<sub>3</sub>-F<sub>6</sub> lines exhibited comparable characteristics to JRF-2 in terms of tolerance to high-temperature-induced oxidative stress.



**Fig. 7.** Biochemical analysis of selected plant lines of F<sub>6</sub> progeny



**Fig. 8.** Evaluation F<sub>6</sub> progeny of flax crop

J. Mitra, D. Saha and K. Mandal  
ICAR-CRIJAF, Barrackpore

# NEWS & EVENTS

## Research Advisory Committee Meeting

The Research Advisory Committee (RAC) meeting of ICAR-CRIJAF, Barrackpore, was held on December 11–12, 2024, under the chairmanship of Dr. P.C. Deka, Vice-Chancellor, Sir Padampat Singhania University, Udaipur (Rajasthan). The committee discussed in detail the research activities of the ICAR-CRIJAF for the period of December, 2023 to November, 2024. The committee was satisfied with the Action Taken Report presented in the meeting. Under the broad mandate of the Institute presented by the Director and Heads of the Division. The RAC made specific recommendations for further strengthening of the research activities of the Institute. The RAC members Dr. L.M. Garnayak, Dr. T. Sreelata, Dr. A. Bandyopadhyay, Dr. Gouranga Kar, Sh. Mahadev Sarkar, Dr. A.K. Mandal, and member secretary Dr. S. Saha attended the meeting. Dr. R.K. Singh and Dr. P.K. Dash joined the meeting online.



Participation of RAC members and Scientists' during Research Advisory Committee meeting at ICAR-CRIJAF

## Institute Management Committee (IMC) Meeting

The Institute Management Committee (IMC) Meeting of ICAR-CRIJAF was convened on 26 November 2024 at the institute's headquarters in Barrackpore. The meeting covered a comprehensive agenda spanning R&D activities, technology transfer, financial planning, infrastructure upgradation, and human resource management. Members deliberated on strategies to enhance the productivity and profitability of jute and allied fibre crops, strengthen linkages with industry and farmers. The committee members emphasized the expansion of infrastructure and upgradation of existing labs for students of IARI Educational Hub, Kolkata. Dr. G. Kar, Director, ICAR-CRIJAF; Dr. P.K. Dash, ADG (Commercial Crops), ICAR; Dr. G. Saha, Vice-Chancellor,

BCKV; Dr. D.R. Bharadwaj, Principal Scientist, ICAR-IIVR; Dr. R.K. Panda, Pr. Scientist, ICAR-IIWM; Dr. D. Kumar, Pr. Scientist, ICAR-IARI; Sri Tapan Sarkar, Addl. Director (Agriculture) and Sri K. Bag, Dy. Director (Horticulture), Govt. of West Bengal; Sri M. Sarkar (Farmer from W.B.), Dr. A.K. Mandal, Nadia (W.B.), Smt. A. Majumdar, FAO (ICAR-NINFET) and Sri R. Mishra, AO, ICAR-CRIJAF, Barrackpore attended the meeting.



Meeting of Institute Management Committee at ICAR-CRIJAF

## Interaction Meeting for Promotion of JAF crops

ICAR-CRIJAF organised an important interaction meeting on 28 October, 2024 to discuss the promotion of jute and related crops. The meeting was graced by Shri Dilip Ghosh, former Member of Parliament, who shared his insights on elevating jute's status and increasing its utilisation. During the productive discussion, various strategies were proposed to showcase jute as an eco-friendly, versatile, and economically viable fibre. Ideas included incentivising jute cultivation, supporting jute farmers and entrepreneurs, developing innovative jute products, and spreading awareness about jute's immense potential. The interaction meeting marked a significant step forward in the mission to revitalise the jute industry in the region.



Shri Dilip Ghosh, former Member of Parliament during the Interaction Meeting for Promotion of JAF crops at ICAR-CRIJAF

## Interaction Meeting of CACP and JCI for Collaboration with Industry in Jute Sector

Members of the Central Agricultural Costs and Prices (CACP), officials from the Jute Corporation of India (JCI), and scientists from ICAR-CRIJAF in Barrackpore convened for an important interaction meeting on 12 September 2024. The gathering brought together key experts to discuss critical issues facing the jute industry. Topics on the agenda included strategies for enhancing jute cultivation practices, improving yield and fibre quality, and promoting the development of innovative value-added jute products. The meeting provided a valuable platform for the exchange of ideas and the forging of collaborations between policymakers, industry representatives, and the scientific community to help propel the jute sector forward.



Members of the Central Agricultural Costs and Prices visiting Museum at ICAR-CRIJAF

## WORKSHOP

### Workshop on Technology Prioritisation for Agriculture and Allied Sectors

ICAR-CRIJAF, in collaboration with the Technology Information, Forecasting, and Assessment Council (TIFAC), successfully hosted a two-day Technology Prioritisation Workshop for Agriculture and Allied Sectors during August 19-20, 2024, at ICAR-CRIJAF, Barrackpore. This workshop focused on identifying and prioritising climate-resilient technologies for the agriculture and allied sectors, addressing the urgent need for both climate change adaptation and mitigation. The event featured remarks by Dr. G. Kar, Director, and distinguished guests, including Prof. P. Srivastava, Executive Director (DST-TIFAC), and Dr. G. Goswami,

Scientist-G (TIFAC). Dr. P. Dey, Director, ATARI-Kolkata, and Dr. B.K. Das, Director, ICAR-CIFRI. The workshop employed the multi-criteria decision analysis technique to evaluate and select the best available technologies that are not only climate-resilient but also socially acceptable, economically viable, and conducive to policy frameworks. Over 50 experts from across the country, specialising in diverse fields contributed to this process.



Release of publication during DST-TIFAC Workshop at ICAR-CRIJAF

### Quality Assurance of Soil Testing Laboratory

An Awareness-cum-Capacity Building Programme on “NABL Accreditation and Quality Assurance of Soil Testing Labs” was organized on 14 June 2024. Mrs. Malancha Das, Deputy Director, NABL, Kolkata has given a presentation on NABL accreditation and recognition scheme for soil testing laboratories with an overview of the present status of NABL accredited laboratories in West Bengal. The event was attended by more than 40 participants including scientists and representative from State Agriculture Department and KVKs.

## MONTHLY SEMINAR

| Speaker                                                                    | Topic                                           |
|----------------------------------------------------------------------------|-------------------------------------------------|
| <b>Dr. Gauranga Kar</b><br>Director, ICAR-CRIJAF<br>(30 Sept 2024)         | Insights from recent deputation in Australia    |
| <b>Dr. Debabrata Sarkar</b><br>Pr. Scientist, ICAR-CRIJAF<br>(14 Nov 2024) | How did it all begin? How will it end? Will it? |



## CELEBRATIONS

### Global Campaign on Tree Plantation

The ICAR-CRIJAF organised an impactful tree plantation program on 17 September 2024, as part of a larger global campaign to promote environmental sustainability. The event brought together researchers, staff members, and local community volunteers who joined hands to plant a diverse array of tree saplings on the institute's campus and surrounding areas. This initiative not only aimed to increase the region's green cover but also sought to raise awareness about the crucial role that trees play in combating climate change, preserving biodiversity, and supporting human well-being. By actively participating in this global campaign, ICAR-CRIJAF demonstrated its commitment to environmental stewardship and inspired others to take steps towards building a greener, more sustainable future for generations to come.



Global Campaign on Tree Plantation in ICAR-CRIJAF campus

### Human Chain for Cleanliness and Sanitation

Staff at ICAR-CRIJAF came together to form an impressive human chain on 21 September 2024, standing united to raise awareness about the vital importance of cleanliness and sanitation. The event served as a powerful demonstration of the institute's steadfast commitment to maintaining hygienic conditions and promoting public health. By joining hands in solidarity, the ICAR-CRIJAF team sent a resounding message about the need for each and every individual to take responsibility for keeping their surroundings clean and sanitary. The human chain was a striking visual representation of the strength that comes from collective action towards a common goal of improved hygiene and community well-being.



Formation of human chain by staff of ICAR-CRIJAF for cleanliness and sanitation

### Vigilance Awareness Week-2024

The Valedictory Ceremony of Vigilance Awareness Week-2024 was held on 6 November 2024, to mark the conclusion of a week-long campaign promoting integrity, transparency, and accountability in public offices. The ceremony featured speeches by the director and administrative officials emphasising the critical importance of upholding vigilance norms and ethical conduct standards for all government employees. Attendees, who included staff of all levels from ICAR-CRIJAF, were reminded of their solemn duty to act as guardians of public trust and to never engage in or tolerate any form of corruption.



Distribution of prizes to participants of Vigilance Awareness Week-2024 of ICAR-CRIJAF

### Tree plantation program 'Ek Ped Maa Ke Naam'

ICAR-CRIJAF organised a massive tree plantation drive in Kultali, Sundarban on 24 September, 2024, as part of the 'Ek Ped Maa Ke Naam' campaign. This noble initiative aimed to promote environmental conservation and pay tribute to mothers by planting trees in their honour. The event witnessed enthusiastic participation from local communities and ICAR-CRIJAF members, who came together to plant a wide variety of native tree species.

across the region. By focusing on an ecologically sensitive area like the Sundarbans, this program not only contributed to expanding the green cover but also raised awareness about the crucial role of trees in preserving biodiversity, mitigating climate change effects, and protecting the unique mangrove ecosystem. On this occasion, 1500 mango (cv. Amrapalli and Mallika) saplings were distributed and planted. The program was attended by more than 1200 farm women and the representatives of press and media.



Distribution of plant saplings by the Director to Farm women of Sundarban during "Ek Ped Maa Ke Naam"

## World Soil Day 2024 Celebrated

ICAR-CRIJAF, Barrackpore, celebrated World Soil Day on 5th December, 2024, under the theme 'Caring for Soils: Measure, Monitor, and Manage'. Director, ICAR-CRIJAF, delivered a keynote address, where he emphasised two key environmental and agricultural issues: the importance of healthy soils and the availability of pure water for growing nutritious crops, while pure water is essential for agriculture and maintaining ecosystem balance. The chief guest, Shri D. Dey, IPS, Addl. CP (SB), Kolkata Police (W.B.), emphasised the importance of soil health as a key to environmental and human health. Dr. A. Biswas, Professor and OAC Chair in Soils and Precision Agriculture, School of Environmental Sciences, University of Guelph (Canada), made a comprehensive presentation on information-driven soil management for sustainability. Soil health cards were distributed to farmers from different villages of Hooghly and North 24 Parganas districts of West Bengal. A demonstration of drone-based precise nutrient application was also organised on this occasion. Around 200 participants, including farmers, scientists, technical personnel,

students, and staff of ICAR-CRIJAF, participated in this program.



Soil Health Card distribution during World Soil Day 2024

## Freshers' Welcome Programme for Students of IARI-Kolkata

The IARI-Kolkata Hub recently organised a Freshers' Welcome Programme, dubbed ESPERANZA, for the newly admitted students on 29 November 2024. The event, aimed at helping the freshers feel at home in their new academic environment, featured a delightful cultural program that showcased the diverse talents of both current students and the newly admitted batch. From mesmerising dance performances representing various regional styles to soulful musical renditions and thought-provoking dramatic acts, the cultural extravaganza had it all. Overall, ESPERANZA set the perfect tone for the start of the academic year, making the freshers feel welcomed, celebrated, and eager to contribute to the vibrant campus life.



IARI-Kolkata education Hub Team during Freshers' Welcome Programme

## Kisan Diwas 2024

ICAR-CRIJAF organised the Kissan Diwas Programme at Kultali, Sundarban, in association with the Kultali Milan Tirtha Society, West Bengal, on 23 December 2024. Prof. Panjab Singh, former Secretary (DARE) and DG (ICAR),

former VC, BHU, and present Chancellor, RLBCAU, Jhansi, was the chief guest of this program. Prof. P. Srivastava, Executive Director, and Dr. G. Goswami, Head, TIFAC, DST were present as guests of honour. Mr. Lokman Molla, Chairman, Kultali Milan Tirtha Society, was also present. During the program, a research-extension-farmer interface meeting was conducted. Prof. Panjab Singh emphasised the commitment of the institute in providing technological support and skill development for the overall livelihood security of the small and marginal farmers of Sundarban. On this occasion, various agricultural inputs like certified paddy seeds (2500 kg), backyard poultry chicks (1500 nos.), poultry feed (2500 kg), vegetable seed kits (1500 nos.), vermi-bed (100 nos.), minor irrigation kits (100 nos.), sprayer machines (75 nos.) were distributed to the farmers. The program was attended by more than 2000 farmers, farm women, and the representatives of press.



Kissan Diwas Programme at Kultali, Sundarban, West Bengal organized by the ICAR-CRIJAF

## FARMERS LINKAGES

### Organic and Natural Farming Inputs Production

A five-day skill development training program was organised on “Preparation of organic and natural farming inputs for sustainable agriculture” for farmers and rural youth during 22-26th July, 2024. The topics covered include methods of bio-stimulants preparation natural farming, methods of composting, insect-pest management, neem-based pesticides, biocontrol agents and their mass multiplication for plant disease management, fish-based IFS, and the importance of livestock manure. Altogether, 30 farmers from the Beraberia, Bodai, Singerber, and Basudevpur villages of West Bengal participated.

### Improved Retting Technology for Quality Jute Fibre Production

A training-cum-field demonstration program on ‘Improved retting technology for quality jute fibre production’ was organised during 3-12 August, 2024, for the SC farmers of Hingalganj block (5 Aug 24), Gaighata block (6 Aug 24), Ranaghat block (7 Aug 24), Swarupnagar block (10 Aug 24), and Habra-I block (12 Aug 24) of North 24 Parganas and in Chakdah block (5 Aug 24) of Nadia district. During the programme, the farmers learnt about the different aspects of improved retting technologies of jute, particularly the importance of improved retting of jute by CRIJAF SONA, its detailed procedure, the disadvantages of traditional retting practices using mud and banana stem, and essential requirements for fetching a good price from the sale of fibre. Field demonstrations were conducted in 8 villages. A total of 300 farmers participated in the program

### Jute Fibre Quality Evaluation and Grading Systems

A training on “Jute fibre quality evaluation and grading systems” was organised for SC farmers of Swarupnagar and Habra-I block, North 24 Parganas district, during 18-20 September, 2024. During the program, the farmers learnt about the different aspects of jute fibre quality and grading systems, particularly the importance of fibre quality and grading systems of jute, jute fibre grading systems and their application, various instruments used for jute fibre grading, and marketing aspects of quality jute fibre. A total of 75 farmers from the Bara Bankra, Choto Bankra, and Galdaha villages of the Swarupnagar block and from the Bharati Nagar, Kumra Kashipur, and Nikarati villages of the Habra-I block, North 24 Parganas, participated in this training program.



Participating farmers of training on Jute fibre quality evaluation

## Skill Development for Making of Jute Bags and Handicrafts by Rural Women of Sundarban

A ten-day basic skill development training program on making jute bags and handicrafts was organised by ICAR-CRIJAF, Barrackpore, for rural women of Sundarban during September 20-29, 2024, at ICAR-CRIJAF, Barrackpore. A similar program on making jute showpieces was organised for rural women of the Amdanga block, North 24 Parganas, during October 21-30, 2024. A total of 40 SC women were trained. During the training, the basic skill of the participants was developed in making jute ornaments, flower bouquets, rakhi, Lakshmi jhapi, Chand Mala, file bags, Shantiniketani bags, shopping bags, sling bags, purses, ladies bags, flower vases, bird sceneries, faces of Lord Ganesha and Maa Durga, and, key rings, etc.

## Use of Farm Machinery in Agriculture and Role of Custom Hiring Centers

A three-day training on “Use of Farm Machinery in Agriculture and Role of Custom Hiring Centres in Farm Mechanisation” was organised at ICAR-CRIJAF, Barrackpore, during 22-24 October, 2024. Trainees visited Kojagori Farmers Producer Company Limited at Babpur, Amdanga Block, North 24 Parganas, to get first-hand knowledge about its formation, management, and different activities carried out for its sustainability. In the valedictory session, Dr. Gouranga Kar, Director, ICAR-CRIJAF, Barrackpore, motivated the trainees about the crop diversification and emphasised the use of improved farm machinery for better input utilisation, reduction in cost of cultivation, value addition, and creating a business model in agriculture. A total of 20 trainees from North 24 Parganas district of West Bengal participated in the training program.



Participating farmers during Farm Machinery training

## हिन्दी कार्यशाला का आयोजन

भाकृअनुप-केंद्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 27 सितम्बर एवं 30 दिसम्बर 2024 को संस्थान के अधिकारियों एवं कर्मचारियों के कार्यालयीन कार्यों में हिन्दी के प्रयोग को तीव्र गति प्रदान करने के उद्देश्य से एक दिवसीय हिन्दी कार्यशाला का आयोजन किया गया। दिनांक 27 सितम्बर के कार्यशाला में श्री अनवर हुसैन, प्राध्यापक, सरोजनी नायडू कालेज फॉर वुमेन को हिन्दी कार्यशाला हेतु आमंत्रित किया गया था। श्री हुसैन ने राजभाषा नीति, नियम, अधिनियम तथा राजभाषा कार्यान्वयन के संबंध में रोचक व्याख्यान के माध्यम से परिचर्चा की। 30 दिसम्बर 2024 के कार्यशाला में डॉ. विचित्रसेन गुप्त, उप निदेशक (कार्यान्वयन), क्षेत्रीय कार्यान्वयन कार्यालय (पूर्व क्षेत्र), कोलकाता ने राजभाषा हिन्दी के प्रगामी प्रयोग को बढ़ावा देने तथा राजभाषा संबंधी अधिनियमों, नियमों एवं आदेशों के अनुपालन विषय पर संसंदर्भ व्याख्यान प्रस्तुत किया गया। कार्यशाला में कुल 75 कर्मिकों (43 अधिकारी एवं 32 कर्मचारी) ने भाग लिया।

## हिन्दी पखवाड़ा का आयोजन

भाकृअनुप-केंद्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 13-27 सितम्बर, 2024 तक हिन्दी पखवाड़ा का आयोजन किया गया। हिन्दी पखवाड़ा-2024 के अन्तर्गत विभिन्न हिन्दी प्रतियोगिताओं का आयोजन किया गया। दिनांक 13 सितम्बर, 2024 को तात्कालिक भाषण प्रतियोगिता, दिनांक 17 सितम्बर, 2024 को कम्प्यूटर पर हिन्दी टंकण प्रतियोगिता, दिनांक 18 सितम्बर, 2024 को हिन्दी निबंध लेखन प्रतियोगिता, दिनांक 19 सितम्बर, 2024 को हिन्दी अनुवाद प्रतियोगिता, दिनांक 20 सितम्बर, 2024 को हिन्दी टिप्पण एवं मसौदा लेखन प्रतियोगिता, दिनांक 23 सितम्बर, 2024 को हिन्दी श्रुतलेखन एवं पठन प्रतियोगिता तथा दिनांक 24 सितम्बर, 2024 को वाद-विवाद प्रतियोगिता का आयोजन किया गया। इन सभी प्रतियोगिताओं में संस्थान के सभी वर्गों के अधिकारियों व कर्मचारियों ने उत्साहपूर्वक भाग लिया। दिनांक 27 सितम्बर, 2024 को अत्यंत उत्साह पूर्ण वातावरण में हिन्दी पखवाड़ा का समापन एवं पुरस्कार वितरण समारोह का आयोजन किया गया। विभिन्न प्रतियोगिताओं में प्रथम, द्वितीय व तृतीय स्थान प्राप्त करने वाले अधिकारियों/कर्मचारियों को निदेशक महोदय, डॉ. गौरांग कर तथा श्री अनवर हुसैन, प्राध्यापक, सरोजनी नायडू कालेज फॉर वुमेन के कर कमलों द्वारा पुरस्कृत किया गया। साथ ही हिन्दी प्रोत्साहन योजना 2023-24 में सम्मिलित 05 (पाँच) अधिकारियों तथा कर्मचारियों को भी पुरस्कार प्रदान किया गया।

## राजभाषा कार्यान्वयन समिति की बैठक

संस्थान में राजभाषा कार्यान्वयन समिति की बैठकें क्रमशः दिनांक 30.09.2024 एवं 20.12.2024 को माननीय निदेशक, डॉ. गौरांग कर जी की अध्यक्षता में आयोजित की गई। 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 (2024-25) के अनुसार “ग” क्षेत्र के लिए निर्धारित 55 प्रतिशत लक्ष्यों पर भी चर्चा की गई। सभी बैठकों के अंत में अध्यक्ष महोदय के प्रति धन्यवाद ज्ञापन के साथ बैठक समाप्त हुई।

## RESEARCH PUBLICATIONS

RESEARCH ARTICLES

**Lifecycle GHG emissions for bioethanol production from lignocellulosic biomass: potential of jute and kenaf feedstock from an Indian perspective**

Arvind Kumar Singh\*, Laxmi Sharma, Tinku Goswami, Pratik Satya and Gouranga Kar

Crop Production Division, ICAR-Central Research Institute for Jute and Allied Fibres, Kolkata 700 121, India

Environ Monit Assess (2024) 196:1101  
https://doi.org/10.1007/s10661-024-13287-6

RESEARCH

**Potential impact of climate change on water productivity and water footprints of rice and wheat in the Indo-Gangetic plains of India**

Gouranga Kar · Arvind Kumar Singh · Debarati Datta

Datta et al. BMC Plant Biology (2024) 24:295  
https://doi.org/10.1186/s12870-024-04970-4

BMC Plant Biology

RESEARCH Open Access

**The sequential microbial breakdown of pectin is the principal incident during water retting of jute (*Corchorus* spp.) bast fibres**

Subhojit Datta<sup>1\*</sup>, Lipi Chattopadhyay<sup>2\*</sup>, Shrestha Barai<sup>3</sup>, Kunal Mandal<sup>4</sup>, Gouranga Kar<sup>5</sup> and Bijan Majumdar<sup>6</sup>

**Journal of Environmental Biology**  
p-ISSN: 0254-8704 · e-ISSN: 2394-0379 · CODEN: JEBIDP

Original Research Paper  
Volume 45 Issue 3 May 2024 pp. 308-316  
DOI: http://doi.org/10.22435/jeb/45/3/MIN-5222

**Retting with efficient microbial consortium helps in improving jute fibre quality and profitability: a study in Eastern India**

B. Majumdar<sup>1\*</sup>, S. Sarkar, S.K. Jha, S.P. Mazumdar, R. Saha, S. Barai, L. Chattopadhyay, N.M. Alam and G. Kar

Field Crops Research 313 (2024) 109457

Contents lists available at ScienceDirect

**Field Crops Research**

journal homepage: www.elsevier.com/locate/fcr

**Ecosystem level carbon and moisture fluxes from a high biomass fibre producing jute crop (*Corchorus olitorius* L.): An eddy covariance-based analysis**

Abhishek Chakraborty<sup>a,\*</sup>, Dhananjay Barman<sup>b</sup>, Prabir Kumar Das<sup>c</sup>, Gouranga Kar<sup>b</sup>, Parichay S. Raju<sup>d</sup>, Mamta Kumari<sup>e</sup>, Debangana Banik<sup>f</sup>, V.M. Chowdhary<sup>g</sup>, K. Sreenivas<sup>h</sup>, Prakash Chauhan<sup>h</sup>



**2<sup>nd</sup> Rank for Excellence Achievements Stall in 'Agri Tech Innovate India' Agri Tech Innovate India- 2024 Exhibition at Pragati Maidan, New Delhi during 29-31 August 2024**

## COMMERCIALIZATION

Three technologies/products were commercialized. The details are as follows:

| Name of the technology | Name of the Licensee (s)                                   | Date                   |
|------------------------|------------------------------------------------------------|------------------------|
| 1. CRIJAF SONA         | M/s M R Aquatech, Odisha, Agrinnovate Pvt. Ltd., New Delhi | 9.8.2024               |
| 2. Nail Weeder         | M/s Krishi Udyog, W.B<br>M/s Creative Displayers, W.B      | 27.8.2024<br>3.10.2024 |

## ROYALTY

A total amount of Rs 35,06,274/- has been received as licensing fees and royalty payment of various commercialized technologies from authorized manufacturer and sellers during July-December, 2024.

## DISTINGUISHED VISITORS

|     |                                                                                                                         |            |
|-----|-------------------------------------------------------------------------------------------------------------------------|------------|
| 1.  | <b>Dr. Punjab Singh</b> , Former Secy (DARE) & Director General (ICAR), Former VC (BHU), and Chancellor, RLBCAU, Jhansi | 23.12.2024 |
| 2.  | <b>Dr. Pradeep Kumar Sharma</b> , Vice-Chancellor, SKUAS, Jammu                                                         | 12.07.2024 |
| 3.  | <b>Prof. Manoranjan Kar</b> , Former VC (OUAT), Bhubaneswar                                                             | 16.07.2024 |
| 4.  | <b>Shri Shashi Bhushan Singh</b> , Secretary, NJB, Kolkata                                                              | 02.08.2024 |
| 5.  | <b>Prof. Pradeep Srivastava</b> , Exec. Director, TIFAC-DST, Delhi                                                      | 19.08.2024 |
| 6.  | <b>Dr N. P Singh</b> , Member at CACP, MoAFW, New Delhi                                                                 | 12.09.2024 |
| 7.  | <b>Sri R.L.I Daga</b> , MoAFW, New Delhi                                                                                | 12.09.2024 |
| 8.  | <b>Comdt. Sujeet Kumar</b> , 32BN BSF, Nadia, West Bengal                                                               | 04.10.2024 |
| 9.  | <b>Dr. H.C. Sharma</b> , Former VC (YSPUHF), Solan                                                                      | 04.10.2024 |
| 10. | <b>Sri S. Povel</b> , Joint Secy, W.B. Minorities Dev. & Fin. Corp. Ltd.                                                | 18.09.2024 |
| 11. | <b>Sri Dilip Ghosh</b> , Former MP (Medinipur), West Bengal                                                             | 25.11.2024 |
| 12. | <b>Dr. Mahadev Bar</b> , Research Engineer, University of Florida                                                       | 09.12.2024 |
| 13. | <b>Prof. P.C. Deka</b> , VC, Sir Padampat Singhanian Univ., Rajasthan                                                   | 11.12.2024 |
| 14. | <b>Prof. L.M. Garnayak</b> , Director (Res.), CAU, Imphal                                                               | 11.12.2024 |
| 15. | <b>Dr. T. Sreelatha</b> , Sr. Professor & Head, ANGRAU, Hyderabad                                                       | 11.12.2024 |
| 16. | <b>Dr. Abhijit Bandyopadhyay</b> , Professor, University of Calcutta                                                    | 11.12.2024 |

## PERSONNEL

### Promotion

| Name            | Designation      | Promoted to           | Date       |
|-----------------|------------------|-----------------------|------------|
| K. N. Chourasia | Scientist        | Scientist RGP Rs.7000 | 02.07.2022 |
| J. K. Meena     | Scientist        | Scientist RGP Rs.7000 | 04.01.2023 |
| Anindita Pal    | Technical Asstt. | STA                   | 24.10.2023 |
| Sandip Roy      | Technical Asstt. | STA                   | 10.12.2023 |
| Pallavi Mandal  | Technical Asstt. | STA                   | 18.12.2023 |
| Kallol Sarkar   | Technical Asstt. | STA                   | 29.12.2023 |
| Raktim Mitra    | Technical Asstt. | STA                   | 22.12.2023 |
| A. M. Pitre     | Technical Asstt. | STA                   | 31.12.2023 |
| Sudip Nandy     | Technical Asstt. | STA                   | 11.02.2024 |
| V. K. Singh     | Sr. Technician   | TA                    | 02.01.2023 |
| Biswajit Biswas | Technician       | Sr. Tech.             | 22.12.2023 |
| Sharmila Sarkar | Technician       | Sr. Tech.             | 24.12.2023 |
| Sanjay Kumar    | Technician       | Sr. Tech.             | 26.12.2023 |
| Paritosh Roy    | Technician       | Sr. Tech.             | 29.12.2023 |
| R. N. Kumar     | Technician       | Sr. Tech.             | 03.01.2024 |
| Sri Banerjee    | Technician       | Sr. Tech.             | 11.01.2024 |
| A. Singha Roy   | Technician       | Sr. Tech.             | 13.02.2024 |
| Kamal Kr. Banik | Sr. Technician   | TA                    | 14.05.2024 |

### Transfer to ICAR-CRIJAF

| Name             | Designation   | Date                                        |
|------------------|---------------|---------------------------------------------|
| Dr. K. G. Mandal | Pr. Scientist | 01.11.2024 (F/N) from ICAR-MGIFRI, Motihari |

### Superannuation

| Name                 | Designation       | Date             |
|----------------------|-------------------|------------------|
| Dr. C. Chattopadhyay | Pr. Scientist     | 31.10.2024 (A/N) |
| Sri K.P. Debnath     | Technical Officer | 31.10.2024 (A/N) |
| Sri Prabin Boro      | SSS               | 30.11.2024 (A/N) |
| Kum. Koushalya       | SSS               | 31.12.2024 (A/N) |
| Pabitra Das          | SSS               | 31.12.2024 (A/N) |

# EDITORIAL

## Unlocking Bioenergy Potential from Jute and Allied Fibres

Jute and allied natural fibers, such as kenaf and hemp, are gaining attention as sustainable feedstock in the bioenergy sector, particularly for the production of bioethanol and bio-compressed natural gas (bio-CNG). These lignocellulosic materials are abundant, renewable, and offer an eco-friendly alternative to fossil fuels. The advent of second-generation (2G) technologies has further enhanced the feasibility of converting these fibers into valuable bioenergy products.

### Bioethanol Production

Second-generation bioethanol is produced by fermenting the cellulose and hemicellulose components of lignocellulosic biomass. Jute and allied fibers are rich in these polysaccharides, making them suitable candidates for bioethanol production.

- **Biomass Yield:** Jute and kenaf plants exhibit rapid biomass accumulation, producing approximately 98 kg of biomass per day per hectare.
- **Ethanol Yield:** While commercial ethanol yields from jute are not extensively documented, studies on similar lignocellulosic materials suggest potential yields ranging from 250 to 350 liters per ton of dry biomass, depending on the efficiency of the pretreatment and fermentation processes.

### Bio-CNG Production

Bio-CNG is produced by anaerobically digesting organic matter to produce biogas, which is then purified to obtain methane. Lignocellulosic biomass like jute can be utilized in this process.

- **Biogas Potential:** The anaerobic digestion of lignocellulosic biomass can yield significant amounts of biogas. However, the complex structure of lignin in jute fibers necessitates effective pretreatment methods to enhance biogas production.
- **Market Growth:** The global market for bio-CNG was 1,477 million MMBTU in 2023 and is expected to grow at a CAGR of 3.4% from 2023 to 2028, reaching 1,745 million MMBTU by 2028. In India, the bio-CNG market is projected to grow at a CAGR of 40.0% during the same period, highlighting significant potential for bio-CNG production from agricultural residues, including jute.

### Advantages of 2G Technologies

Second-generation technologies offer several benefits in processing jute and allied fibers:

- **Non-Competition with Food Crops:** 2G biofuels utilize non-food parts of plants, ensuring that their production does not compete with food supply chains.
- **Environmental Benefits:** Utilizing agricultural residues like jute reduces waste and associated environmental issues, such as open-field burning, which contributes to air pollution.
- **Carbon Intensity:** 2G bioethanol has been identified as one of the cleanest fuels produced on a commercial scale, with a carbon intensity of 7.55 gCO<sub>2</sub>/MJ, as confirmed by the Air Resources Board in California.

### Challenges and Considerations

While the potential is significant, several challenges must be addressed:

- **Technological Hurdles:** Efficiently breaking down the complex lignin structure in jute sticks requires advanced pre-treatment technologies.
- **Economic Viability:** Establishing cost-effective supply chains for collecting and transporting jute biomass is crucial for commercial success.
- **Policy Support:** Supportive government policies and incentives are essential to promote investment in 2G biofuel technologies.

In conclusion, jute and allied natural fibres hold substantial promise in the bioenergy sector, particularly with the advancement of 2G technologies. Their utilization can contribute to sustainable energy production, waste reduction, and environmental conservation. Continued research, technological innovation, and supportive policies will be pivotal in realizing the full potential of these natural fibers in the bioenergy landscape.



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