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DIRECTOR'S MESSAGE



Greetings !

Natural fibres are important for sustainable societal development as they provide an eco friendly, renewable, and sustainable material that can be used in many applications. Natural fibres are biodegradable, meaning they do not contribute to environmental pollution. This is an important factor as it allows for a sustainable production cycle and reduces the amount of waste sent to landfills. Additionally, these fibres can be used in a variety of ways, including clothing, furniture, insulation, packaging and also have the ability to absorb moisture, making them ideal for use in furniture, bedding, and other items, reducing the need for plastic and synthetic materials.

The emergence of new age technologies like Artificial Intelligence (AI), Cloud Machine Learning, Satellite Imagery and advanced analytics are creating an ecosystems for smart jute and allied fibre crop farming. Fusions of all these technologies are being introduced by the scientists of ICAR-CRIJAF for achieving higher average yield through better utilization of the farm inputs and natural resources. I am confident that our R&D efforts will continue to support our farm families' livelihoods and fulfil the requirements of export promotion in the future.

We thankfully acknowledge all our stakeholders and farmers who have supported us, and their trust in our mission enables our effort. I am highly grateful to Dr. Himanshu Pathak, Secretary, DARE, Govt. of India and Director General of ICAR, for his visit to our institute and providing all his support and guidance. I express my sincere gratitude and thanks to Dr. S.K. Dutta, Chairman (RAC & QRT) and his team for their constant encouragement and support. I also acknowledge the efforts of the editorial team and scientists of the institute for publishing this bulletin on time.



वसुधैव कुटुम्बकम्

ONE EARTH • ONE FAMILY • ONE FUTURE



हर कदम, हर डगर
किसानों का हमसफर
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RESEARCH NOTES

Rainfall and Temperature Projections under Climate Change in the Indo-Gangetic Plains of India

The two RCP scenarios (RCP4.5 and RCP8.5) were used to create the climate change scenarios for precipitation and ambient temperature (T_{max} , T_{min}) of the IGP region for the baseline period of 1983–2018 and the future period of 2030–2090. Both RCP4.5 and RCP8.5 scenarios exhibit similar spatial patterns of rainfall change. In the upper part of the IGP region, precipitation would be higher (6–8%) in the high emission scenario (RCP8.5) than under the RCP4.5 scenario. The Trans Gangetic Plain region (Punjab, Haryana) experienced the lowest rainfall according to the geostatistical analysis of normal rainfall data for the IGP, whereas the middle (Uttar Pradesh) and lower (Bihar, West Bengal) Gangetic Plain regions experienced more rainfall (Fig. 1). In contrast to the eastern half of the IGP (eastern Uttar Pradesh, Bihar, West Bengal), which has a humid climate with annual rainfall of 1000–1500 mm, the western portion of the IGP (Punjab, Haryana, western Uttar Pradesh) has a semi-arid climate with annual rainfall of 500–800 mm. Crop production and farm returns likewise exhibit a downward trend from the western to the eastern IGP. The IGP's mean annual T_{max} exhibited an upward trend under both RCP scenarios. The maximum temperature rise occurred in the upper and middle IGP (Punjab, Haryana, UP), where T_{max} increased by 1.13 to 2.31 °C under RCP 4.5 and by 1.65 to 2.74 °C under RCP 8.5. Unlike the T_{max} , which increased more than the T_{min} under both scenarios, the T_{min} increased more under the two RCP scenarios at lower IGP (West Bengal, Bihar). This suggests that GHG concentrations will have a significant impact on the pattern of upcoming changes in precipitation and temperature in the IGP.

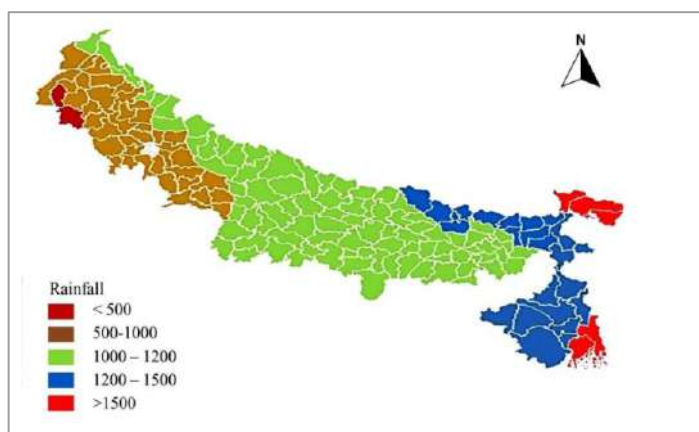


Fig. 1. Normal rainfall distribution in the Indian Indo-Gangetic Plain

G. Kar, A.K. Singh and D. Datta
ICAR-CIRIJA, Barrackpore

Land Use and Land Cover Mapping of the Indian Sundarbans

Land Use Land Cover (LULC) analysis and mapping of the Sundarbans were carried out to provide information to help users to understand the problems and prospects of the unique ecosystem. The Landsat data of the year 1988 and 2022 were used for LULC classification using QGIS environment. The Sundarbans region was classified into seven LULC classes such as forest, vegetation, river, waterbody, fallow land, agricultural land and built up areas for both the years using supervised classification method. The respective changes of these classes were -313.8, +139.0, -102.4, +259.0, +625.8, -1465.9, and +858.2 sq. km. The positive sign (+) denoted the increase of the area under a particular class, and the negative sign (-) denoted its decrease in the year of 2022 from 1988. Over the 34 years of time, the lands under the forest, river, and agriculture classes have decreased substantially, however, the lands under vegetation, waterbody (other than river), fallow and built up areas have increased in the Sundarbans region (Fig. 2). This LULC mapping will enable the monitoring of temporal dynamics of agricultural ecosystems, forest conversions, surface water bodies, etc. for the sustainable development goal in the Indian Sundarbans region.

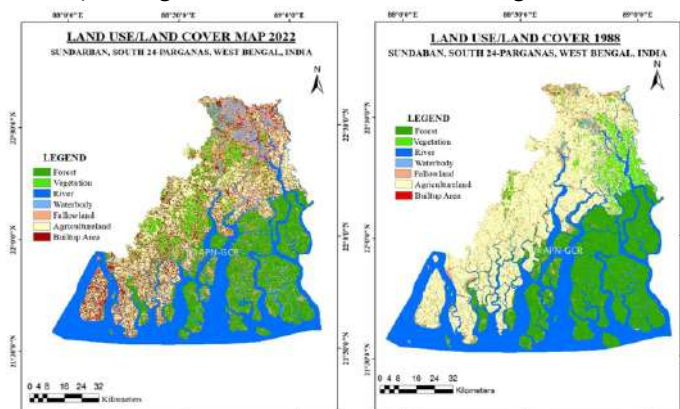


Fig. 2. Land use classification of Sundarbans region, India (1988 & 2022)

D. Barman¹, S. K. Srivastava², G. Kar¹, S. Banerjee³,
S.A. Arfin-Khan⁴, S.A. Mukul⁵ and R. Hindersah⁶

¹ICAR-CIRIJA, Barrackpore; ²University of the Sunshine Coast, Australia; ³BCKV, Mohanpur; ⁴Shahjalal University of Science and Technology, Bangladesh
⁵United International University, Bangladesh; ⁶Universitas Padjadjaran, Indonesia

Soil Organic Carbon of Jute Growing Soils of North Bengal

The spatial distribution of soil organic carbon plays an important role in soil quality assessment and sustainable land use. The existing datasets on soil organic carbon (SOC) at various soil depths for jute growing areas of Coochbehar, Jalpaiguri and Alipurduar (North Bengal) were used to produce detailed soil organic carbon maps for the district. The mean SOC (%) of Coochbehar, Jalpaiguri and Alipurduar districts varied within the range of 0.25-1.44% (Fig. 3). The soils of Mohitnagar and Raiganj block, Jalpaiguri district are mostly

high in SOC content where as Dhupguri and Jalipaiguri sadar block are moderate in SOC content. The soils of Alipurduar district are moderately high in SOC content (Range: 0.61-0.81%). Similarly, the soils of Coochbehar district are moderate to high in SOC content highest being in Dinhata block (0.79%).

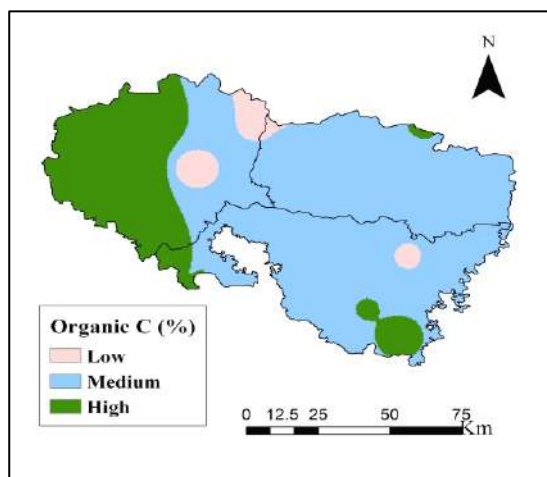


Fig. 3. SOC map of jute growing soils of North Bengal

R. Saha, S. Mitra, S. Khoroar, N.M. Alam, A. Paswan,
S.P. Mazumdar and G. Kar
ICAR-CRIJAF, Barrackpore

Verification of ST-TY (Soil Test-Target Yield) Equation Developed for Jute and Mustard in Farmers' Field

The ST-TY equation was developed for jute (Co-58) and mustard (cv. Kesari 5111) in the research field of ICAR-CRIJAF. Ten field verification trials for jute (cv. Co 58) and five for mustard (cv. Kesari 5111) were carried out at Ghetugachi village, Haringhatta, Nadia district (W.B.) under farmers' field condition in 1.5 ha and 0.91 ha area, respectively. Application of fertilizers as per ST-TY could achieve the target yield of 40 q/ha jute (cv. JRO Co 58) with (-) 6.0% fibre yield deviation. Integration of inorganic fertilizer with FYM achieved the targeted yield of jute fibre completely without showing any yield deviation. On the other hand, application of fertilizer as per ST-TY could achieve the target yield of 15q/ha of mustard (cv. Kesari 5111) at (+) 2.1 % grain yield deviation and integration of FYM with inorganic fertilizer achieved the target with (+) 7.5% yield deviation (Table 1).

Table 1. Verification trial of ST-TY equation of Mustard (cv. Kesari 5111) under farmers' field condition

Treatment	Yield (q/ha)	Yield deviation	B:C ratio
T1- Farmers' Practice	12.78	-	1.7
T2-Recommended dose of fertilizer	13.56	-	1.9
T3- ST-TY (15q/ha)	15.32	(+) 2.1	2.0
T4-ST-TY (15q/ha) + IPNS	16.12	(+) 7.5	2.1

B. Majumdar, S.P. Mazumdar, A.R. Saha, M.S. Behera,
N.M. Alam and S. Ghosh
ICAR-CRIJAF, Barrackpore

Effect of Tillage and Residue Management on Soil Microbial Activities under Jute-Rice-Lentil Cropping System

The effect of conventional tillage and no-tillage with various residue management practices (paddy straw/ Sesbania/ Crotonaria @ 3 t/ha) on soil microbial properties and enzymatic activity (soil microbial biomass carbon, Dehydrogenase activity) were evaluated under jute-rice-lentil cropping systems. Microbial activities were much higher in no-tillage (+R/-R) as compared to conventional tillage practice (Fig. 4). Soil microbial biomass carbon (SMBC) and dehydrogenase activity (DHA) were significantly higher in NT+ Sesbania @ 3 t/ha (470.21 µg/g and 1.67 µg TPF g/ha) followed by NT+ Crotonaria @ 3 t/ha (393.81 µg/g and 1.56 µg TPF g/ha), NT+ paddy straw @ 3 t/ha (379.37 µg/g and 1.38 µg TPF g/ha) against NT+ no residue (310.97 µg/g and 1.08 µg TPF g/ha). The changes in microbial activities can be accredited to fluctuations in crop residue availability, soil moisture, and temperature and rhizosphere effects as affected by different residue management treatments.

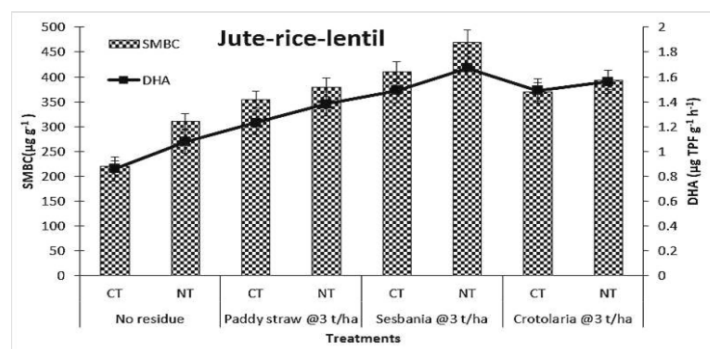


Fig. 4. Soil microbial activities under tillage and residue management in jute-rice lentil cropping system

R. Saha, S. Mitra, S.P. Mazumdar, D. Datta, A. Paswan and G. Kar
ICAR-CRIJAF, Barrackpore

Jute Rhizosphere Soil Physicochemical Properties and Total Viable Bacterial Counts

A study was carried out to assess soil physico-chemical properties and bacterial colony counts of the 24 locations in Murshidabad, Hooghly, North 24 Parganas, and Nadia districts of West Bengal. The soil moisture content was highest in Phooltala (27%) and lowest in Chourampur (5%). Soil pH, on the other hand, did not vary largely among the locations studied. Chalardanga (8.85) and Bharatinagar 1 (6.80) had the highest and lowest pH values, respectively. The electrical conductivity (EC) varied five times between lowest (0.07 ds/m) found in Bhabanipur - 1 and highest (0.34 ds/m) in Balighat. The maximum concentration of organic carbon (0.89%) was reported in CRIJAF experimental field (100% NPK+FYM @5t/ha) and Panchkahania-2, lowest in Raninagar (0.45%). The CRIJAF experimental field-4 and Panchkahania-2 had the highest level

of available nitrogen (148.96 g/g soil), and Bhabanipur-1 had the lowest level (70 g/g soil). In contrast, Babanipur-1 had the highest level of available phosphorus (42.30 g/g soil), and Domkal had the lowest level (3.75 g/g soil). The available potassium (132.59 g/g soil) was observed maximum in Panchkahania-3 which was roughly twice as high as the lowest concentration in Domkal (57.66 g/g soil). The size of the culturable bacterial population varied greatly; Domkal had the highest (18.3×10^8 cfu/g soil), while Kumra had the lowest (11.3×10^5 cfu/g soil) (Fig. 5). The present findings demonstrated that soil physicochemical parameters varied significantly among the 24 locations. This variation in soil properties from one location to another may be attributed to factors like crop management, nutrient management, and soil management practices.

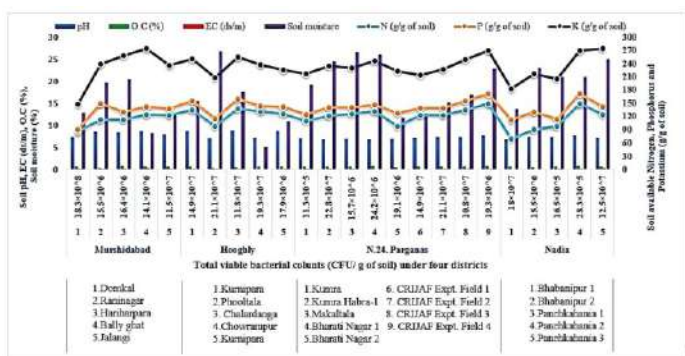


Fig. 5. Soil physicochemical properties and the bacterial colony counts of the 24 locations in West Bengal (O.C: Organic carbon; EC: Electrical conductivity; CFU: Colony forming units)

A. K. Lavanya, A. R. Saha, S. Datta, S. K. Sarkar and D. Datta
ICAR-CRIJAF, Barrackpore

Effect of Planting Methods and Integrated Nutrient Management on Fibre Yield of Ramie

The effect of planting methods and integrated nutrient management (INM) systems on fibre yield of ramie cultivar R1411 was studied at Research Farm of ICAR-CRIJAF, Barrackpore. The experimental data revealed that the total fibre yield of ramie (summed over three cuttings) recorded in ridge and furrow (RF) method of planting (14.55 q/ha) was significantly higher than the yield obtained with raised bed (RB) (11.40 q/ha) or flat bed (FB) (9.49 q/ha) planting systems. The RF and RB methods recorded 53.3 and 20.1% higher fibre yield over FB planting method, respectively. The magnitude of increase in fibre yield of the crop due to N addition (over unfertilized control) varied from 55.2% in case of 100% recommended dose of N (RDN) to 62.5% in 150% RDN treatment. The integrated N management treatments (125% N from RDN + 25% N from FYM / ramie compost) on the other hand recorded 66.7 to 87.7% increase in fibre yield of ramie over control treatment (Fig. 6). The interaction between planting methods and N management in ramie revealed that

the highest fibre yield (18.57 q/ha) of the crop was recorded with the S3F5 treatment combination followed by S3F4 (16.06 q/ha) treatment combination. This clearly indicated that 25% substitution of recommended fertilizer N dose (at 150% level) through ramie compost or FYM increased the fibre yield of the crop and also reduced the cost of cultivation by ₹2500-3200/ha/year.

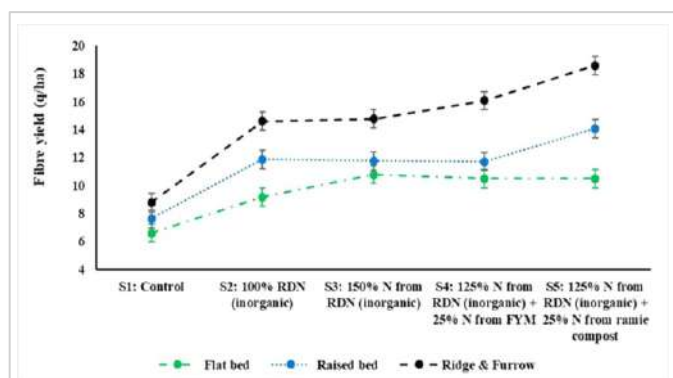


Fig. 6. Interactive effect of planting methods and N management on fibre yield of ramie.

S. Mitra, N. M. Alam, S. Ghosh, S. P. Mazumdar,
R. Saha, A. K. Singh and G. Kar
ICAR-CRIJAF, Barrackpore

Suitable Intercrops for Enhancing the Productivity of Mesta under Rainfed Ecosystems in Odisha

A study was conducted at the Research Farm of Jute Research Station (OUAT, Kendrapara) under AINPJAF programme to identify the suitable intercrops for increasing the productivity and profitability of mesta cultivation under rainfed conditions in the coastal region of Odisha. All the intercropping systems recorded significantly higher mesta equivalent yield (MEY) over sole mesta while mesta + groundnut (2:2), mesta + greengram (2:2) and mesta + blackgram (2:2) systems were found to be most productive ones as they recorded 68.5 to 86.3% higher MEY (46.35 to 51.22 q/ha) compared to sole mesta crop (27.5 q/ha). Intercropping mesta with maize, groundnut, green gram and black gram increased the profitability of mesta cultivation as the intercropping systems recorded additional gross return of ₹ 28057 to 70412/ha over sole mesta. Maximum gross return was recorded with mesta + ground nut (2:2) intercropping system (₹ 152225/ha) followed by mesta + greengram (2:2) system (₹ 142878/ha). Maximum B:C ratio was recorded with mesta + green gram (2:2) (6.02) followed by mesta + black gram (2:2) (5.80) and mesta + ground nut (2:2) (5.07) intercropping systems. Thus, intercropping of mesta with pulses and oilseeds like greengram, blackgram and groundnut in 2:2 row ratio will increase the productivity and profitability of mesta cultivation and will increase the acceptance of the mesta crop to the farming community of coastal region of Odisha.

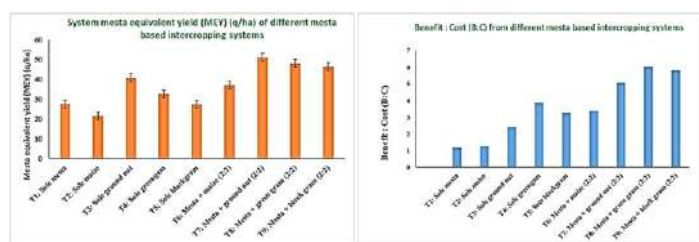


Fig. 7. Mesta equivalent yield and benefit - cost ratio of mesta based cropping systems at Kendrapara, Odisha

S. Jena¹, S. Mitra, N. M. Alam, R. Saha, S.P. Mazumdar and G. Kar
¹Jute Research Station, OUAT, Kendrapara
ICAR-CRIJAF, Barrackpore

High Throughput Screening for Bio-Control Efficiency of *Trichoderma*

Identification and selection of a potential bio-control agent usually initiate with large number of isolates. In-vitro dual culture study against the target pathogen(s) is more often than not becomes the first step. However, this system does not consider interaction between the plant, pathogen and bio-agent. At the same time, number of isolates at the initial phase remains high and the screening method needs to be easy and fast. Hence, a high throughput screening technique for *Trichoderma* isolates was designed. The bio-agent was used as seed treatment of jute and tested against stem rot causing pathogen *Macrophomina phaseolina*.



Fig. 8. Status of the seedlings from control and treated jute seeds four days after sowing

A high throughput screening technique was developed to test the efficiency of the *Trichoderma* isolates as seed treatment against *M. phaseolina*. The pathogen sclerotia were seeded on 1x Hoagland agar plates and incubated for 72 h when the fungal lawn covered the growing medium. Conidia suspensions (107 CFU) of different *Trichoderma* isolates were prepared in 5% soluble starch (as sticker). Susceptible jute (cv. JRC412) seeds were treated coated with this suspension and placed on the plate. Two controls, untreated and 0.1% carbendazim-treated seeds were also included. The plates were incubated with 16/8 h light/dark cycle. Temperature varied between 30 and 38 °C (Fig. 8). Seed germination and seedling mortality were counted till ~80% of seedlings from untreated seeds were dead (3-4 DAS). The method is easy to perform, requires less resources and of short duration. Ten

isolates, CJMR180, CJMR187, CJMR191, CJMR192, CJMR193, CJMR196, CJMR197, TVC-1 and TV-10 performed well under these conditions.

K. Mandal
ICAR-CRIJAF, Barrackpore

Temperature-Dependent Phenology Model of Mealybug

The phenology model is done to understand climate change impacts by examining how phenological events respond to climate variables. In the present study, effects of temperature on the development time and mortality of different stages of mealybug were investigated. The studies on the temperature-dependent development of mealy bug were carried out at five constant temperatures (14, 19, 25, 31, and 36 °C) maintained inside the incubator. The temperatures play an important role in the development rate of mealybug life stages. The fastest mean development times for crawler and II-instar were observed at 31°C (crawler 4.1±0.5 days and II-instar 6.0±0.09 days) whereas for III-instar, the fastest development was observed at 36°C (5.2±0.09 days). The temperature dependence of immature developmental rates was well explained by the modified four parameters version of Sharpe and DeMichele model:

$$r(T) = \left\{ \frac{D_{min}}{2} \times (\exp(k[T - T_{opt}]) + (\exp(-k \times [T - T_{opt}])) \right\}^{-1}$$

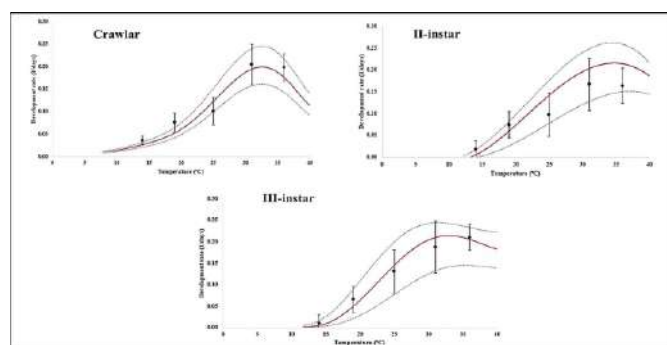


Fig. 9. Temperature-dependent development rate of immature stages of mealybug

The increase in development time decreases with the increase in temperature up to 34°C and increases in a further increase in temperature. The Optimum temperature for the development of the crawler, II-instar and III-instar obtained is 33.9, 35.1, and 34.6°C, respectively (Fig. 9). The temperature-dependent mortality of mealybug was described Weibull function with AIC value of 25.6. The model predicted the optimum temperature for survival of immature life stages within the range of 29–31°C (>80% survival).

N.M. Alam, S. Satpathy, D. Barman, S.K. Karkar and S. Mitra
ICAR-CRIJAF, Barrackpore

Effect of Soil Application of Bleaching Powder on Soil Microbial Population

Managing soil-borne plant diseases using bleaching powder (calcium hypochlorite) is relatively a newer option. An experiment was carried out at ICAR-CRIJAF Research Farm to monitor soil microbial population in jute crop at different doses of bleaching powder (@ 5 – 150 kg/ha) on three dates (7, 15 and 30 DAS). It was observed that a drastic decline in soil population of bacteria, fungi and other microbes was observed 7 days after application of bleaching powder in soil. After 15 days of soil application, population of bacteria, fungi and other microbes was increased and found at par with initial level. As the dose increased from 5 – 150 kg/ha, soil microbial population slowly decreased with lowest CFU at highest dose of 150 kg/ha at 7 and 15 DAS compared to untreated check with maximum CFU of microbial population of $10.6 - 28.6$ CFU/g soil $\times 10^{-4}$ in fallow uncultivated soil and $11.6 - 32.6$ CFU/g soil $\times 10^{-4}$ in untreated soil. After which the lethal effect of bleaching powder on soil microbial population slowly decreased indicating a near stable population of soil bacteria ($24.6-25.6$ CFU/g soil $\times 10^{-4}$), fungi ($26.6-28.6$ CFU/g soil $\times 10^{-4}$) and other microbes ($10-10.6$ CFU/g soil $\times 10^{-4}$) in comparison to untreated soil (Fig. 10).

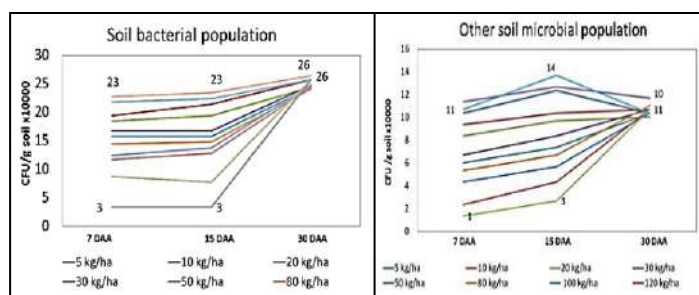


Fig. 10. Effect of pre-sowing soil application of bleaching powder on soil microbial population in jute

R. K. De, V. Ramesh Babu and Shamna A.
ICAR-CRIJAF, Barrackpore

Determination of Lethal Dose of Ethyl Methane Sulphonate (Chemical mutagen) in Tossa Jute and Roselle

Chemical mutagenesis experiment in tossa jute and roselle was performed with the potent mutagen ethyl methane sulphonate, (EMS) by treating a set of seeds (50) with four replications. Dose standardization experiment is done in jute by using 1%, 1.25%, 1.5%, 2% and 2.5% of EMS treated for 1 hour, 4 hour and 8 hour along with control (untreated), whereas, in roselle it was done by using varying doses of EMS (30 mM, 35 mM, 40 mM, 45 mM, 50 mM, 55 mM, 60 mM) treated for 18 hours. Observations were taken on seed germination percentage in both the crops. The experimental results reveal that there is an increasing trend in the seed mortality rate with increase in the dose of chemical mutagen and enhanced hours

of treatment duration (Fig. 11 & 12). Lethal Dose 50 value (LD 50) of tossa jute is found at a concentration of 1% of EMS treated for 4 hours. Validation of these results was done in popular tossa jute varieties viz., JRO 524, JRO 204 and JROBA3. LD 50 value of roselle is found at 45 mM of EMS treated for 18 hours.

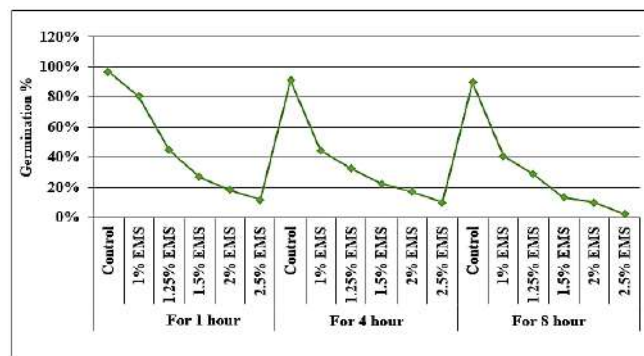


Fig. 11: Treatment of varying concentrations of EMS in tossa jute for varying durations

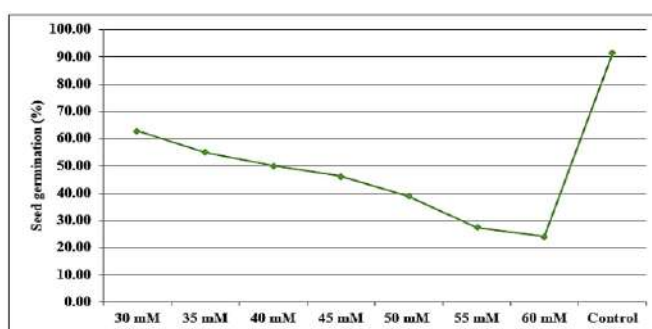


Fig. 12: Treatment of varying concentrations of EMS in roselle (AMV 5) for 18 hours

N. Mohan, S.K. Pandey and Thiribhuvan R.
ICAR-CRIJAF, Barrackpore

Release and Notification of Jute and Mesta Varieties

Consequent upon rigorous evaluation across 7 JAF growing states under multi-location trials of AINPJAF, four high yielding jute and mesta crop varieties (Fig. 13) have been released and notified by the Central Sub-committee on Crop Standard, Notification and Release of Varieties vide the Gazette of India notification no. S.O. 1056(E), dated 6th March 2023 for commercial cultivation in entire jute and mesta growing regions of the country.

The tossa jute variety JROBA 3 (Mukunda) developed through interspecific hybridization has average fibre yield 32 q/ha is suitable for early sowing owing to its pre-mature flowering resistance and its potential fibre yield is 40 q/ha. Another variety JRCP 5 (Pankaj) is a high yielding (average fibre yield 28.5 q/ha) white jute variety with red stem colour. It is tolerant to stem rot disease and yellow mite. High anthocyanin and flavonoid contents not only provide stress tolerance but also make it suitable for vegetable purpose.

The HC mesta (kenaf) variety JBMP 5 (Vibhav) has been released and notified for commercial cultivation in Andhra Pradesh, Odisha, Maharashtra, West Bengal and Tamil Nadu. Its average fibre yield is 29 q/ha with a potential fibre yield of 38-41 q/ha. It is resistant to yellow vein mosaic disease and major insect pests of mesta. The roselle mesta variety HSLC 1 has been released and notified for cultivation in entire mesta growing regions exclusively for calyx production as an edible crop. The average fresh calyx yield is 42.6 q/ha with a potential yield of 60 - 61 q/ha. The fresh calyx of this variety is rich in minerals (K, Ca, Mg, Fe) and vitamins (C, B1, B3, B5) contents.



Fig. 13. Field photograph of four released varieties

S. K. Pandey, P. Satya, S. Mitra and N. M. Alam
ICAR-CRIJAF, Barrackpore

Identification of Jute and Allied Fibre Crop Varieties for Central Release

Four varieties of jute and allied fibre crops have been identified by the Variety Identification Committee chaired by the ADG (Commercial Crops), ICAR, New Delhi during the 34th Annual Workshop of AINPJAF held at MPKV, Rahuri on 24th February 2023 for their central release.

Tossa jute variety JROP-4 (Renuka): Developed through backcross breeding using S19 as female parent and wild species *Capsularis trilocularis* as male parent at ICAR-CRIJAF. Its average fibre yield is 31.24 q/ha with a potential yield of 38-39 q/ha and is suitable for cultivation in tossa jute growing region of West Bengal, Assam, Bihar, Odisha, Uttar Pradesh and Tripura. It is tolerant to stem and root rot disease and Bihar hairy caterpillar and semilooper (Fig. 14).

White jute variety JRCP-7: Bred at ICAR-CRIJAF by crossing two parents i.e. (CIM 036 x JRC 517) x JRC 517 followed by pedigree selection. It is suitable for all the *Capsularis* jute growing regions of West Bengal, Odisha, Bihar, UP, Tripura and Assam. It is a high yielding variety with average fibre yields of 31.5 q/ha with tolerant to stem and root rot disease and Bihar hairy caterpillar, stem weevil and yellow mite. It has better fibre quality with stronger and finer fibre (Fig. 14).

Tossa jute variety JROV-5 (Vitapat-1): It is the first variety of tossa jute identified for growing as vegetable crop. This variety has been developed at ICAR-CRIJAF through pedigree method by crossing F5 progeny of interspecific cross S 19 x JRC 212 with JRO 204 followed by progeny selection. It is specifically

adapted to Olitorius jute growing belt of the country during March to September. It produces 151 q/ha average foliage yield at 30 DAS which is rich in vitamin C content (1.05 mg/ g fresh leaf weight) (Fig. 14).

Kenaf variety JBMP-6: Developed at ICAR-CRIJAF through back cross breeding using two parents i.e. [(KEX-11 x AMC 108) x AMC 108] followed by pedigree selection (Fig. 14). This variety is adapted to rainfed agro-ecosystem of Andhra Pradesh, Odisha, Maharashtra, West Bengal, Bihar and North-Eastern states for mid-April to May sowing. Its average fibre yield is 28 q/ha with less root content and fewer defects coupled with stronger and finer fibre. Due to high cellulose, hemicellulose and lignin content, it is suitable for paper industries.



Fig. 14. Field photograph of four identified varieties

S. K. Pandey, P. Satya, S. Mitra and N. M. Alam
ICAR-CRIJAF, Barrackpore

Evaluation of Improved Flax Fibre Extractor

The functional performance of the improved flax fibre extractor for its material capacity, throughput capacity and extraction efficiency were evaluated at ICAR-CRIJAF, Barrackpore. Retted and dried flax straw from different AINP on JAF centres and other projects were processed in the machine for extraction of fibre. During the evaluation, the material capacity and throughput capacity was found to be 75-80 kg flax straw/h and 40-45 kg flax fibre/h, respectively. The extraction efficiency was 90-95% with fibre recovery range from 42-52 % in dry weight basis. The fibre extraction using the machine (Fig. 15) found to be satisfactory in terms of quantity and quality of fibre. The operational process of the machine is very simple and very easy to use. No specific skill is required to operate or adjust the machine. The machine is helpful in fibre industries to extract fibre from flax straw plant.



Fig. 15. Extraction of flax fibre using Improved Flax Fibre extractor

R.K. Naik, C.S. Kar, G. Kar, S. Mitra and S.K. Jha
ICAR-CRIJAF, Barrackpore

NEWS & EVENTS

Hon'ble Secretary, DARE and Director General, ICAR visited ICAR-CRIJAF

Hon'ble Secretary of DARE, and Director General of ICAR, Dr. Himanshu Pathak, visited the ICAR-CRIJAF, Barrackpore, on 15 January 2023, and interacted with farmers, scientists, and staff of the ICAR-CRIJAF, as well as with the Directors and Heads of Regional Stations of Kolkata-based ICAR institutes. Dr. Pathak expressed satisfaction with the promotion and outreach of institutes' technologies and the farmers' feedback on their effectiveness in improving yield, quality, and reducing the cost of cultivation. He also inaugurated some newly created facilities like institute's main gate-cum-sale counter and the farmers' hostel of ICAR-KVK (North 24 Parganas, Additional). Dr. Gouranga Kar, Director highlighted that the institute has transformed the research projects into need-based, demand-driven, problem solving programs for the improvement of jute and allied fibers. About 250 farmers, farm women, SHG members, scientists, and ICAR personnel participated in this program.



Visit of Dr. H. Pathak to ICAR-CRIJAF and inauguration of Institutes' main Gate and KVK Training Hostel

MEETINGS

QRT Meeting of ICAR-CRIJAF

Meeting of Quinquennial Review Team (QRT) was held on 14 June 2023, in which the progress and achievements of of ICAR-CRIJAF during the last 5 years were reviewed by the Committee under the Chairmanship of Prof. S. K. Datta, VC, Biswa Bangla University, and former DDG (CS), ICAR. Other members, Dr. N. K. Singh, National Professor, ICAR-NIPB, New Delhi; Dr. Sain Dass, Former Director, ICAR-DMR, New Delhi; Prof. R. K. Ghosh, Ex Professor, BCKV, Kalyani; Dr. Virendra Kumar Baranwal, National Professor, ICAR-IARI, New Delhi; and Prof. V. K. Dhanpuri, Former Prof. and Head, CSK HPKV, Palampur, were also present.



Meeting of Quinquennial Review Team (QRT) on 14th June 2023

Institute Research Council Meeting

The Institute Research Council (IRC) meeting was held on 14-16 March 2023, to review the institute's research projects. Altogether, 39 ongoing and five new research projects were discussed. Dr. Gouranga Kar, Director and Chairman (IRC), congratulated the scientists for the achievements made and suggested to strengthen the need-based and demand-driven technology-oriented research for the stakeholders of the jute and allied fibre sectors. All the heads and in-charges of divisions and sections and scientists from headquarters and research stations were present in the meeting.



Institute Research Council meeting of ICAR-CRIJAF during 14-16 March 2023

4th Scientific Advisory Committee Meeting

The 4th Scientific Advisory Committee meeting of ICAR-KVK, North 24 Prgs (Additional) was held on 28 February 2023. Dr. Gouranga Kar, Director, ICAR-CRIJAF, chaired the meeting. Dr. P. P. Pal, Principal Scientist, ICAR-ATARI, Zone V, Kolkata; Dr. Champak Bhagat, NDRI-Eastern Regional Station, Kalyani; Dr. S. Naskar, IVRI-Eastern Region Station, Kolkata; officers from KVK, Ashokenagar; State Line departments; the Heads/In-charges of the Divisions/Sections and Nodal Officers, KVKs of ICAR-CRIJAF, along with the farmer members, attended the meeting. Director, ICAR-CRIJAF, suggested to focus on the need-based, demand-driven, and problem-solving transfer of technologies.



Scientific Advisory Committee (SAC) meeting of ICAR-KVK (North 24 Prg-Additional) on 28th February 2023

Meeting with Ghana Delegation Team

A delegation of research scientists, CEOs, and senior officials of industries associated with the jute sector of Ghana visited ICAR-CRIJAF on 23 April 2012. The team interacted with the Director and other scientists as well as visited the exhibition hall, fibre museum, gene bank, jute retting complex, and research field of the institute. The delegates were impressed to know about the scientific and technological developments in the Indian jute sector led by ICAR-CRIJAF and also desired to have mutual collaboration for the popularization of jute cultivation in Ghana.



Ghana delegation team interacting with Director of ICAR-CRIJAF

Interactive Meeting between ICAR-CRIJAF and ICAR-CIRCOT

An interactive meeting on "Prospect and potential of allied fibres (flax, sisal, and ramie) in India" was organized on 26 April 2023, between ICAR-CRIJAF and ICAR-CIRCOT for possible research collaboration and a future roadmap of the expansion program of the allied fibre crops. Dr. Gouranga Kar, Director, ICAR-CRIJAF, and Dr. S.K. Shukla, Director, ICAR-CIRCOT, along with Heads of Division and Scientists of both institutes, were present in this meeting.

Interaction Meeting between ICAR-CRIJAF and ISRO-SAC

On May 3, 2023, an online meeting was conducted to discuss the scope of collaboration between ICAR-CRIJAF, Barrackpore and ISRO-SAC, Ahmedabad, regarding the application of the geospatial technique in jute farming and research. An action plan was prepared on stress assessment in jute cultivation using high resolution remote sensing data for developing resilient management strategies for providing decision support system to farmers of West Bengal in consultation with concerned scientists.

WORKSHOP & SEMINAR

34th Annual Workshop of AINPJAF

The 34th Annual Workshop of the All India Network Project on Jute and Allied Fibres (AINPJAF), ICAR-CRIJAF was organized on 23–24 February 2023, at MPKV, Rahuri (Maharashtra). The Workshop was attended by 44 scientists from nine AINPJAF centers and ICAR-CRIJAF. Three jute varieties, JROV-5, JROP-4, and JRCP-7, and one mesta variety, JBMP-6, were identified in the Variety Identification Committee (VIC) Meeting chaired by Dr. R. K. Singh, ADG (CC), ICAR, New Delhi, for submission to the Central Sub-Committee on Crop Standards, Notification, and Release of varieties for agricultural crops. In the three Concurrent Technical Sessions (Crop Improvement, Crop Production, and Crop Protection), the technical program for the year 2023–24 was discussed and finalized.



ADG (CC) conducting workshop of AINP with Director (ICAR-CRIJAF), Incharge (AINP) and Experts at MPKV, Rahuri, Maharashtra

IPR Issues in Agricultural Sciences

A workshop entitled "Intellectual Property Right (IPR) Issues in Agricultural Sciences" was organized in hybrid mode on 18 January 2023, with the objective of sensitizing the younger scientists about the importance of intellectual property rights (IPR) in the development of agricultural technologies and products. Dr. Vikram Singh, Sr. Scientist, IPTM, ICAR HQ, New Delhi; Dr. Yashawant Dev Panwar, Scientist, TIFAC, Faridabad; and Dr. Sakshi Gupta, Registered Patent Agent at IARI, New Delhi, were present in the workshop. They explained the scope and potential of products and technologies related to jute and allied fibers for IPR. The program was organized by the ITMU section of the institute. Altogether, 46 scientists from the institute attended the workshop conducted in hybrid mode.



Director and scientists attending workshop on "IPR issue in Agriculture Sciences" on 18th January 2023

Recent Advances in Plant Genome Editing

A two-day workshop with a brainstorming session on "Recent Advances in Plant Genome Editing and Regulatory Guidelines" was organized on 8–9 February 2023, for faculty members from colleges and universities. On this occasion, Prof. Swapan Kumar Datta, Vice Chancellor of Biswa Bangla Biswabidyalay and former Deputy Director General (Crop Science), ICAR, New Delhi, Chaired the brainstorming session on February 9, 2023. Dr. R. K. Singh, ADG (CC), ICAR, New Delhi; Prof. Timir Baran Jha, Former Head of Botany, Presidency University; and Dr. Viswanathan Chinnusamy, JD (Res.), ICAR-IARI, New Delhi, were among the expert panelists. Prof. Swapan Kumar Datta appreciated the institute for organizing this important event in cutting-edge genome editing technologies for the benefit of participating faculty members and scientists. Dr. Gouranga Kar, Director, ICAR-CRIJAF, emphasized the need for preparedness for the application of genome editing tools in jute and allied fibre crops. Twenty-five faculty members from colleges and universities who are involved in teaching and research, the scientists, technical staff, and students and scholars of ICAR-CRIJAF participated in the program. The

program was organized under the Scientific Social Responsibility (SSR) program of SERB, DST.



Director (ICAR-CRIJAF) with scientists (ICAR-CRIJAF) and participants of workshop

Managing Soil with Sensors and AIML

A seminar was organized jointly by ICAR-CRIJAF and the Indian Society of Soil Science, Kolkata chapter, in hybrid mode (offline and online) on 24 January 2023, at ICAR-CRIJAF, Barrackpore. The lecture on "Agriculture 5.0: Managing Soil with Sensors and AIML" was delivered by Dr. Somsubhra Chakraborty, Associate Professor, Agricultural and Food Engineering Department, IIT Kharagpur. The session was chaired by Dr. S. K. Sanyal, Former Vice-Chancellor, B.C.K.V., Mohanpur, in the presence of Dr. Gouranga Kar, Director, ICAR-CRIJAF, and President, ISSS, Kolkata Chapter. A total of 61 participants participated in the seminar.



Director and scientists attending seminar on "Agriculture 5.0: Managing Soil with Sensors and AIML"

National Seminar on "Recent Developments of Scientific Research in Soil, Water and Environment"

A National Seminar was organized jointly by ICAR-CRIJAF and the Department of Agricultural Chemistry and Soil Science, University of Calcutta, from April 30 to May 1, 2023. Scientists from ICAR-CRIJAF presented research papers on recent developments of scientific research in soil, water and environment related to jute and allied fibers.

Miscellaneous Events

Survey of Agricultural and Mangrove Ecosystems

ICAR- CRIJAF organized a survey program of the Indian Sundarbans region during 20–23 February, 2023 at different islands of the Sundarbans delta under the multinational (Australia, Bangladesh, India, and Indonesia) Project on "Protecting ecosystems and livelihoods of the Sundarbans, a World Heritage Site: Assessing the impact of natural hazards on forest and jute-based ecosystems" funded by the Asia Pacific Network for Global Change Research (APN-GCR). The survey team consists of Scientists from ICAR-CRIJAF, India, and faculty from the University of the Sunshine Coast, Australia, and BCKV, India.



Scientists and faculty of project team during survey program of the Indian Sundarbans region

IoT project on Water Management Launched

A project on "In-Season Smart Sensor Enabled Advanced Technological Interventions for Real Time Water Management" sponsored by DST (SEED), Govt. of India was started in April 2023 with a total cost of Rs.119.54 lakh for 3 years (2023-2026). The objectives of the study is- i) to develop and utilize sensor network for soil moisture monitoring in jute growing areas of West Bengal ; ii) to develop irrigation schedules using soil moisture sensors under different soil moisture depletion in jute-rice-mustard crops, and iii) to evaluate crop yield and water productivity of sensor-based against conventional irrigation system. In this project, Internet of Things (IoT) techniques in agriculture shall be used for real time monitoring of the changes in soil moisture content in order to develop an effective irrigation strategy. Sensor's kit for measuring air and soil temperature, air pressure, light intensity, soil moisture content and different gases concentration shall be developed for an intelligent wireless sensor network. The project will be implemented in collaboration with CSIR-CMERI, Durgapur, W.B.

ICAR-CRIJAF Initiated Multispectral Unmanned Aerial Vehicle Remote Sensing in Jute and Allied Fibres

ICAR-CRIJAF, in collaboration with RRSC-East (NRSC, ISRO), Kolkata, jointly initiated a research program on multi-sensor multispectral Unmanned Aerial Vehicle Remote Sensing (UAV-RS) to study the phenotypic traits and abiotic and biotic stresses in jute and allied fibres. Dr. Gouranga Kar, Director, ICAR-CRIJAF; Shri. Suparn Pathak, DGM, RRSC-East, Kolkata; and Dr. Prabir Kumar Das, Sci/Eng-SF, RRSC-East, were present during the survey on May 30, 2023.

Participation in ICAR Zonal Sports Competition

ICAR-CRIJAF participated in the ICAR Zonal Sports Competition (East Zone) 2022 and won two Gold medals (high jump and long jump); six Silver medals (4 x 100 m relay race, volleyball, discuss, 100 m race, 400 m race, 800 m race); and five Bronze medals (200 m race, 1500 m race, javelin, men's high jump, and women's high jump). The sports events were organized at ICAR-IVRI, Izzatnagar, Bareilly (U.P.) during April 24-27, 2023. About 450 participants from 18 institutes of the ICAR participated in 23 types of indoor and outdoor games.



Director and Staff of ICAR-CRIJAF with trophies won in ICAR Zonal Sports Competition (East Zone) 2022



71st Foundation Day of ICAR CIRIJAF

ICAR-CIRIJAF celebrated its 71st Foundation Day on 9 February 2023. On this auspicious occasion, Prof. Swapan Kumar Datta, Vice Chancellor of Biswa Bangla University and former Deputy Director General (Crop Science), ICAR, New Delhi, graced the occasion as the Chief Guest. Prof. Timir Baran Jha, Former Head of Botany, Presidency University, Dr. B. K. Das, Director, ICAR-CIFRI, Barrackpore; Dr. Pradip Dey, Director, ICAR-ATARI, Kolkata; and Mr. Debdu Mukherjee, Asst. Director, NJB, Kolkata, were the Guests of Honor. The guests and dignitaries released balloons, and pigeons cut the cake in commemoration of the 71st Foundation Day of the institute. The guests inaugurated the exhibition stalls displaying proven technologies developed by ICAR-CIRIJAF, KVKs, and SHGs. Dr. S.K. Datta, the Chief Guest, appreciated the institute for putting excellent effort into increasing its visibility among related stakeholders.



Director and delegates during the Foundation Day of ICAR-CIRIJAF on 9th February 2023

World Intellectual Property Day

An awareness program was organized on 26 April 2023, as a part of the celebration of "World Intellectual Property Day" under the theme 'Women and IP: Accelerating Innovation and Creativity' to sensitize the women staff of the institute about the necessity of protecting farm innovation and creativity in day-to-day life. The program was chaired by Dr. Gouranga Kar, Director, ICAR-CIRIJAF, in the presence of the heads of the Divisions and In-charges of various sections. Dr. Gouranga Kar has highlighted the role of women in the development of innovation and creativity and appreciated the scientists of the institute for developing the institute's technologies. Other HoDs and In-charges shared their knowledge and experiences as per the theme of World IP Day 2023.

Republic Day Celebration

Republic Day was celebrated on 26 January 2023, at the ICAR-CIRIJAF campus in the presence of CIRIJAF staff and their family members. Dr. Gouranga Kar, Director, hoisted the national flag, followed by the recitation of the national anthem. Director, Head of the Divisions, Scientists, Officers of Administration and Finance, etc. conveyed the message of Republic Day on this occasion.



Director and staff of ICAR-CIRIJAF hoisting the National Flag



World Environment Day Celebration

An awareness program on 'World Environment Day' was organized by ICAR-CIRIJAF, Barrackpore, in association with KVK, North 24 Parganas (Additional) on 5 June 2023, in Huda village, Nadia district (W.B.). The topics on which deliberation was made by the scientists were: i) jute-based products: An alternative to single-use plastic; and ii) the use of plastics and its role in air and water pollution. During the program, a plantation program of neem tree saplings was done in the village, and saplings were also distributed to the participants for plantation in their backyards. Altogether, 50 farmers participated in the World Environment Day program.



Organization of World Environment Day in Huda village, Nadia district (W.B.)

FARMERS LINKAGES

Awareness- cum- Training Programme on Plant Genetic Resources Conservation

ICAR-NBPGR, New Delhi, in collaboration with ICAR-CRIJAF, organized an awareness and training program on "Plant Genetic Resources Conservation for Improving Nutritional and Livelihood Security of Farmers and Promotion of Natural Fibres" on 2-4 February 2023, at ICAR-CRIJAF, Barrackpore. The main objective of the training was to create awareness among the SC farmers regarding the conservation and proper utilization of traditional crop varieties and promote natural fibres to improve their nutritional and livelihood security. Sri Dhrubajyoti De, I.P.S., Joint Commissioner, Kolkata Police, and Sri Sourav Barik, SDO, Barrackpore, graced the occasion as Chief Guest and Guest of Honour. Dr. Gouranga Kar, Director, ICAR-CRIJAF, highlighted the major objectives of the program and said that the visibility of ICAR will increase if the institutes work in such collaborations for proper utilization of resources for the upliftment of agriculture and farm families. More than 200 farmers and SHG members attended the training and interacted with the scientists. All the participants received their certificates of participation and the farm inputs during the valedictory session.



Participating farmers with farm inputs received in the training program on Plant Genetic Resources Conservation

Skill Development Training on Jute Fibre Based Handicrafts under SCSP

A 15-day-long skill development training on jute fibre based handicrafts was organized under SCSP from February 14 to 6 March 2023, for the benefit of jute-growing farm families. The major objective of the program was to augment the income of jute farmers through off-farm income from jute fibre based value-added products. Twelve farmwomen had participated in

the training program. A range of jute-based decorative items like flowers with vases, scenery, Idols of Lord Ganesha, Goddess Durga, etc. were made by the trainees during the program. Dr. Gouranga Kar, Director, ICAR CRIJAF, applauded all the trainees for their successful participation in the program. He also gave an insight on the importance of jute-based diversified products in national and international markets.



Participating farm women with their product prepared in the training program

Training Program on Improved Jute Production Technology

A three-day training program on Improved Jute Production technology was organized under the DST SEED Project on technological and economic empowerment of jute farmers from 20-22 March 2023, at ICAR CRIJAF. Forty farmers from Beraberia, Ratanpur, Indrapur, Basudebpur, & Hansia (W.B.) participated in the training program. Both theory and hands-on training were conducted. A demonstration of improved machinery that is used for jute cultivation was done for the benefit of the participants. The trainees actively participated in the sessions. Dr. Gouranga Kar, Director, ICAR CRIJAF, had advocated for the farmers to adopt improved jute production technology in order to improve jute productivity and quality.



Director of ICAR CRIJAF with participating farm women

Training Program on Enhancing Production in Jute-based Cropping Systems through Efficient Nutrient Management

An awareness and training program on "Enhancing Production in Jute-based Cropping Systems through Efficient Nutrient Management" was organized by ICAR-CRIJAF in collaboration with ICAR-NBSSLUP, Regional Centre, Kolkata, on 22–23 March 2023. The main objective of the training program was to create awareness among the SC farmers about the scientific, judicious, and smart use of plant nutrients for enhancing productivity in jute-based cropping systems. Director, ICAR-CRIJAF, and scientists of ICAR-NBSS & LUP, Regional Centre, Kolkata, distributed CRIJAF Multi-Row Seed Drill and Nail Weeder to the farmers for line sowing and mechanical weed management in the jute crop. About 100 farmers and SHG members attended the training.



Participating farmers receiving farm inputs during the training

Training on Farm Mechanization in Jute-Based Cropping Systems for Enhancing Productivity and Profit

A five-day farmers' training program on "Farm Mechanization in Jute-based Cropping Systems for Enhancing Productivity and Profit" under the STC-TSP Program was organized during 19–23 June 2023, at ICAR-CRIJAF, Barrackpore. A total of 15 ST farmers from Nadia district (W.B.) participated in the program. The topics covered were the importance of farm mechanization, use of tractors and power tillers in agriculture, the safe use of plant protection equipment, the maintenance of health and safety in the workplace, etc. In the concluding session, Dr. Gouranga Kar, Director, ICAR-CRIJAF, emphasized the importance of farm mechanisation for timely field-operation and reducing the cost of cultivation.

Training on Improved Retting Technology for Better Quality Jute Fibre

A three-day training program on "Improved Retting Technology for Better Quality Jute Fibre" was organized by ICAR-CRIJAF from June 7 to June 9, 2023, for the scheduled caste community of Chakdah block, Nadia district, under SCSP. A total of 30 farmers participated in the program.

Trainers' Training on Improved Production Technology for Quality Jute Fibre Production (JUTE-ICARE)

A series of eight training programs on 'Improved Production Technology for Quality Jute Fibre Production' under Jute-ICARE were organized at ICAR-CRIJAF, Barrackpore, during 14–15 February 2023, 27–28 February 2023, 1–2 March 2023, 6–7 March 2023, 17–18 April 2023, 19–20 April 2023, 24–25 April 2023, 31st May–1st June 2023, involving 192 Block supervisors, master trainers, and agriculture officials from the states of West Bengal, Assam, Bihar, Meghalaya, Jharkhand, Nagaland, and Uttar Pradesh. In these trainings, topics like the prospects of the Jute-ICARE program, production technology of jute, crop cutting experiments on jute, improved retting with CRIJAF Sona, pest and disease management of jute, etc. were covered. In the valedictory session, Dr. Gouranga Kar, Director, ICAR-CRIJAF, encouraged and suggested that the trainees implement their acquired knowledge for better crop yield and increased profitability from farming without causing any damage to the environment in their state.



Director, ICAR-CRIJAF talking to participating officials of Jute-ICARE project during valedictory function of the training program

Training on Soil Testing for Jute-based Cropping Systems

A three-day farmers' training on 'Soil Testing and Nutritional Recommendation for Jute-based Cropping System' was conducted during 13–15 March 2023, at the ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, for the tribal farmers under TSP-STCR. In this training, 20 tribal farmers from Makaltala and Farmania villages in the Habra block of the North 24 Parganas districts participated.

Training Program on Improved Cultivation Practices and Management of Rice Crops under STC-TSP

A three-day farmers' training program on "Improved Cultivation Practices and Management of Rice Crops" under the STC-TSP Program was organized during 26–28 June 2023, at ICAR-CRIJAF, Barrackpore. A total of 23 ST farmers from Chakdah Block, Nadia district of West Bengal participated in

the program. In this training, improved method of paddy cultivation and seed production was covered through various lectures and field visits. In the concluding session, Dr. Gouranga Kar, Director, ICAR-CRIJAF, advised the trainees to apply knowledge obtained through training in field situations.

Training on Integrated Pest Management for Enhancing Productivity of Rice in Jute Based Cropping System

A three-day training program on "Integrated Pest Management for Enhancing Productivity of Rice in Jute-Based Cropping Systems" was organized at ICAR-CRIJAF during 21–23 March 2023, for the tribal community of Makaltala village, North 24 Parganas (W.B.) under the Tribal Sub Plan. A total of 20 tribal farmers participated in the program. During the program, the farmers learned about the recent approaches to Integrated Pest Management (IPM) in jute based cropping systems, weed management, disease and pest management biocontrol, and the safe use of pesticides. The farmers actively interacted with the resource persons regarding the problems they faced in pest and disease management and were satisfied with the solutions advised by the experts.



Participating farmers discussing pest disease problems with scientists of ICAR-CRIJAF

Training on Plant Protection Measure for Jute Crop

A training program on "Plant Protection Measure for Jute Crop" was organized at ICAR-CRIJAF on 30 May 2023, for the tribal community of Chakdah village, North 24 Parganas (W.B.) under the Tribal Sub Plan. A total of 20 tribal farmers participated in the program. During the program, the farmers learned about the recent approaches to pest and disease protection in the jute crop. The farmers actively interacted with the resource persons regarding the problems they faced in pest and disease management and were satisfied with the solutions advised by the scientists.

Training on Role of Custom Hiring Centres in the Mechanization of Jute-based Cropping Systems

A farmers' training on 'Role of Custom Hiring Centres in Mechanization of Jute-based Cropping Systems' was organized during 15–17 February 2023, at ICAR-CRIJAF, Barrackpore. A total of 20 SC farmers from Goaldah (Swarupnagar Block), and Taraberia and Bhabagachhi, (Amdanga Block) of North 24

Parganas district (W.B.) participated in the program. In the valedictory session, Dr. Gouranga Kar, Director, ICAR-CRIJAF, interacted with the farmers and emphasized the importance of advanced training on Agriculture Machine Operation for skill development and employment generation. The critical inputs and farm Implements were distributed among the farmers.



Certificate distribution by the resource person during valedictory function of the training

Training on Mushroom Production Technology for Enhancing the Rural Livelihood of Tribal Farmers

A three-day training program entitled "Mushroom Production Technology for Enhancing Rural Livelihood of Tribal Farmers" was organized at ICAR-CRIJAF, Barrackpore, during 23–25 January 2023, under the TSP Program. A total of 20 tribal women farmers and rural youth from various villages of Barrackpore, North 24 Parganas were trained in the program. The objective of the training program was to provide first-hand training on the production technology of oyster mushrooms and mushroom spawn production to the trainees. The training was conducted in a two-way interactive mode, i.e., theory and practice. Scientists from ICAR-CRIJAF distributed mushroom cultivation starter kits (spawn, agricultural lime, fungicides), agricultural inputs (Irrigation kits, small farm implements), and participation certificates to the tribal farmer trainees.



Participating ST farm women preparing mushroom casing mixture during the training

Kisan Sammelan and Farmers-Scientist Interaction

ICAR-CRIJAF, in association with Gobardanga Farmers Sewa Samiti, North 24-Parganas, organized a Kisan Sammelan and farmers-scientist interaction program on June 15, 2023, to promote and get feedback on the technologies and skill training promoted by the Institute for farmers, farm women, SHGs, and FPOs. Prof. S. K. Datta, VC, Biswa Bangla University, and former DDG (CS), ICAR, and Chairman QRT, ICAR-CRIJAF, was the Chief guest on the occasion. While interacting with the women members of SHGs, he expressed satisfaction with the activities undertaken by ICAR-CRIJAF to enhance the skills and income of farm women. More than 1000 farmers, farm women, SHG members, and scientists attended this program.



Director, ICAR-CRIJAF interacting with participating farmers in Kisan Sammelan in Gobardanga village of West Bengal

Field Day and Farm Input Distribution under TSP Program

A field day on "Pond-based Integrated Self-Reliant Eco-farming Systems in Jute" and the "Farm Input Distribution Programme" under TSP was organized at Dakshin Dinajpur district in collaboration with KVK, Balurghat (W.B.), on March 15, 2023. A total of 100 tribal farmers from Mathurapur, Ajhair, Munglishpur, Barshapara, Arjunpur, Dilalpur, Jashurapara, Tapan, and Dakshin Dinajpur participated in this program. The tribal farmers were given agricultural inputs like vermicompost beds, a backpack sprayer, an irrigation kit or water can, and small farm implements. The tribal farmers were highly satisfied and motivated to adopt the pond-based integrated farming system technology for livelihood security.



Farmers with farm inputs and farm implements provided by the ICAR-CRIJAF during Field Day

Agri-Drone Demonstration

ICAR-CRIJAF has been selected as one of the ICAR Institutes for "Drone technology demonstration" under the Sub Mission on Agricultural Mechanization during 2022-23. In this aspect, a drone-based spraying demonstration was carried out at the ICAR-CRIJAF campus on March 22, 2023, to create farmers' awareness and promote drone technology. Dr. Gouranga Kar, Director, ICAR-CRIJAF, explained to the farmers that Drone technology is going to be very popular among farmers in the near future. It's a boon to the jute farmers, as it will become very handy to apply the pesticides and monitor the crop with better accuracy and in the shortest amount of time. Various benefits of drone-based spraying were explained by ICAR-CRIJAF scientists to farmers, which created great interest and motivation among the stakeholders. The program was attended by 150 farmers and other stakeholders.



Director and scientists of ICAR-CRIJAF with participating farmers during demonstration of Agri Drone

Stakeholder's Meeting at Sundarbans

ICAR-CRIJAF organized a stakeholders meeting on February 22, 2023, at Gosaba, Sundarbans, under the multinational (Australia, Bangladesh, India, and Indonesia) Project sponsored by APN-GCR and UNiSC, Australia. A total of 25 farmers from the locality, an NGO representative, and a local administrative representative participated in the interaction meeting. The bags made of jute fibres were distributed among the participants for an awareness campaign of biodegradable products against plastics to maintain the good health of the agricultural and mangrove ecosystems. Dr. D. Barman, Senior Scientist & PI of the project (ICAR-CRIJAF), described climate-induced natural hazards such as a tropical cyclone and its impact on the Sundarbans. Dr. Sanjeev Srivastava, Associate Professor, UniSC, Australia, briefed about the APN-GCR objectives for sustainable development goals (SDGs), the vulnerability of the mangrove ecosystem, and mechanisms for uplifting of livelihood of the local people.

संस्थान में एक दिवसीय हिंदी कार्यशाला का आयोजन

भाकृअनुप – केंद्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान, बैरकपुर, कोलकाता में दिनांक 2 मार्च, 2023 एवं 27 जून, 2023 को एक दिवसीय हिंदी कार्यशाला का आयोजन किया गया। इस कार्यशाला की अध्यक्षता संस्थान के माननीय निदेशक, डॉ. गौरांग कर जी के द्वारा किया गया। 2 मार्च, 2023 को कार्यशाला में हिन्दी विशेषज्ञ, श्रीमती पूनम दीक्षित, पूर्व उपनिदेशक, हिन्दी शिक्षण योजना, राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, गुवाहाटी द्वारा कार्यालय में राजभाषा हिन्दी के प्रगामी प्रयोग को बढ़ावा देने के लिए प्रयोजनमूलक हिन्दी एवं हिन्दी टिप्पण एवं मसौदा लेखन आदि विषयों पर प्रशिक्षण प्रदान किया गया। 27 जून, 2023 को कार्यशाला में हिन्दी विशेषज्ञ, श्री निर्मल कुमार दुबे, प्रभारी-उप निदेशक (कार्यान्वयन), राजभाषा विभाग, गृह मंत्रालय, भारत सरकार, निजाम पैलेस, कोलकाता द्वारा संघ की राजभाषा नीति, नियम, राजभाषा का महत्व एवं राजभाषा नियम / अधिनियम विषयों पर व्याख्यान दिया। उन्होंने प्रतिभागियों से कार्यालयीन कार्य में प्रयुक्त होने वाले प्रशासनिक शब्दों / प्रशासनिक वाक्यांशों इत्यादि पर हिन्दी पर्याय पूछे। कार्यशाला में उपस्थित सभी प्रतिभागियों ने पूरे सत्र में शांतिपूर्वक ढंग, उत्साहपूर्वक एवं तल्लीन होकर ज्ञानार्जन किया।



हिन्दी कार्यशाला में उपस्थित प्रतिभागी तल्लीन होकर ज्ञानार्जन करते हुए

राजभाषा कार्यान्वयन समिति की बैठक का आयोजन

संस्थान में राजभाषा कार्यान्वयन समिति की बैठक दिनांक 31 मई 2023 को माननीय निदेशक, डॉ. गौरांग कर जी की अध्यक्षता में आयोजित की गई। वित्तीय वर्ष 2023-24 के लिए राजभाषा कार्यान्वयन समिति की यह प्रथम तिमाही बैठक थी। बैठक के दौरान संस्थान में हो रही विभिन्न गतिविधियों में हिन्दी के प्रगतिशील प्रयोग के तरीकों और साधनों पर चर्चा की गई तथा राजभाषा विभाग द्वारा जारी वार्षिक कार्यक्रम (2023-24) के अनुसार "ग" क्षेत्र के लिए निर्धारित 55 प्रतिशत लक्ष्यों पर भी विस्तार पूर्वक चर्चा की गई।



डॉ. गौरांग कर जी की अध्यक्षता में राजभाषा कार्यान्वयन समिति की बैठक

RESEARCH PUBLICATIONS

Environmental Science and Pollution Research (2023) 30:61904–61912
https://doi.org/10.1007/s11356-023-26430-0

RESEARCH ARTICLE

Jute and kenaf carrier bags: an eco-friendly alternative to plastic bags in India

Arvind Kumar Singh¹ · Shamna Aboo¹ · Tinku Goswami¹ · Gouranga Kar¹

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© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2023

Received: 19 April 2022 / Accepted: 26 September 2022
DOI: 10.1111/ppa.13456

ORIGINAL ARTICLE

Stem rot of jute (*Corchorus* spp.): New insight on its causal organisms

Kunal Mandal¹ · Dipankar Ghosh¹ · Chandan S. Kar²

Spatial Variability of Soil Organic Carbon, pH and Electrical Conductivity and Its Influencing Factors in a Watershed of Coastal Region of Odisha, India

Gouranga Kar, Prasanta Kumar Patra & Arvind Kumar Singh

To cite this article: Gouranga Kar, Prasanta Kumar Patra & Arvind Kumar Singh (2023) Spatial Variability of Soil Organic Carbon, pH and Electrical Conductivity and Its Influencing Factors in a Watershed of Coastal Region of Odisha, India, Communications in Soil Science and Plant Analysis, 54:14, 2031–2044, DOI: 10.1080/00103624.2023.2211114

To link to this article: <https://doi.org/10.1080/00103624.2023.2211114>

Journal of the Indian Society of Soil Science, Vol. 70, No. 4, pp 456–463 (2022)
DOI: 10.5958/0974-0228.2022.00047.0

Organic Farming Improves Soil Aggregation and Organic Carbon Status in the Rice-Wheat Cropping System in an Inceptisol

Paulson Thomas, Dinesh Kumar¹, Debarati Datta², Ritesh Saha² and Debashis Chakraborty*

Division of Agricultural Physics, ICAR-Indian Agricultural Research Institute, New Delhi, 110012, India

JOURNAL OF PLANT NUTRITION
https://doi.org/10.1080/0190167.2023.2222009

Taylor & Francis
Taylor & Francis Group

Sulfur fertilization enhanced productivity and profitability of popular kenaf varieties

Sonali Paul Mazumdar, Dilip Kumar Kundu, Debarati Datta, Bijan Majumdar, Amit Ranjan Saha, Nurnabi Meherul Alam, Sitangshu Sarkar, Ritesh Saha, Sabyasachi Mitra, and Gouranga Kar

Division of Crop Production, ICAR-CRIJAF, Kolkata, West Bengal, India



Dr. N.M. Alam, Sr. Scientist receiving Young Scientist Award by the Directorate of Research, UBKV, W.B.

AWARDS & RECOGNITIONS

- **Dr. N.M. Alam**, Sr. Scientist received Young Scientist Award by Directorate of Research, Uttar Banga Krishi Vishwavidyalaya on the occasion of National Seminar on “Climate resilient and input efficient agriculture for food and nutritional security” at Uttar Banga Krishi Vishwavidyalaya, Pundibari during 19-20 January 2023.
- **Dr A. Bera**, Sr. Scientist received best paper award at National Conference on “Natural fibre for sustainable societal development” held at ICAR-NINFET, Kolkata during 03-04 January, 2023 organized by The Indian Natural Fibre Society, ICAR- NINFET and ICAR-CRIJAF.
- **Dr. G. Kar**, Director and **Dr.D. Barman**, Sr. Scientist, ICAR-CRIJAF visited United International University, Dhaka, Bangladesh during 17-18 February, 2023 for attending project workshop, field visit and review meeting of the multinational (Australia, Bangladesh, India, Indonesia) project titled “Protecting ecosystems & livelihoods of the Sundarbans, a World Heritage Site: Assessing the impact of natural hazards on forest and jute-based ecosystem services” sponsored by APN-GCR and UniSC, Australia.
- **Dr. R. Saha**, Principal Scientist as Joint Organizing Secretary of National Conference on “Natural fibre for sustainable societal development” at ICAR-NINFET, Kolkata during 03-04 January, 2023; Co- Organizing Secretary of National Seminar on “Recent developments of scientific research in soil, water and environment” at Kennedy Hall, Calcutta University during 30 April-01 May, 2023.

PERSONNEL

New Joining (through Inter-Institutional Transfer)

Name	Designation	Date
Dr. Rakesh Bhowmik	Scientist	01.03.2023
Dr.Sanjay Saha	Pr. Scientist	20.03.2023

Promotion

Name	Designation	Promoted to	Date of promotion
Dr. Ranjan Kumar Naik	Sr. Scientist	Pr. Scientist	27.06.2021
Sri Kalipada Debnath	T-5	T-6	06.12.2021
Sri Soumya Sarathi Kundu	T-5	T-6	06.01.2022
Sri Ritesh Kumar	Assistant	AAO	29.03.2023
Sri Santi Nath Pal	Tech. Asst.	Sr. Tech. Asst.	10.07.2021
Sri Joydeep Pal	Tech. Asst.	Sr. Tech. Asst.	06.07.2021
Sri Avtar Singh	Tech. Asst.	Sr. Tech. Asst.	11.12.2021
Sri Sanjib Ghosh	Tech. Asst.	Sr. Tech. Asst.	11.12.2021
Sri Radhya Shyam Yadav	SSS	LDC	20.06.2023

REGISTRATION/IPR PROTECTION

Trademark of ‘ICAR-CRIJAF Tech’

Trademark application of ‘ICAR-CRIJAF Tech’, a logo to be attached with all the ICAR- CRIJAF products or technologies to enhance Institute credentials, has been registered under Trade Mark Act, 1999 of Section 23 (2), Rule 56(1) by Trade Marks Registry Office, Govt. of India (Application No. 5454490 in Class 42 dated 19.05.2022) with validity up to ten years (19.05.2032).



Design Registration of ‘Improved Fibre Extractor for Flax’

Design Registration for ‘Improved Fibre Extractor for Flax’, an electrically operated high capacity fibre extractor for retted and dried straws of flax, has been issued by the Patent Office, Govt. of India under Design Application No. 337776-001 in Class 15-03 on 21.01.2021 for ten years (upto 21.01.2031).



COMMERCIALIZATION

A total amount of ₹ 46,26,701 has been received as royalty payment of various commercialized technologies (CRIJAF SONA, Jute Seeder) from authorized manufacturer and sellers during January-June, 2023.

Transfer

Name	Designation	Transferred to
Dr. Hemraj Bhandari	Sr. Scientist	ICAR- DOGR, Pune
Dr. Kajal Das	Scientist	ICAR- NBPGR, New Delhi
Dr. Suman Roy	Scientist	ICAR- NBPGR, New Delhi
Dr. Laxmi Sharma	Scientist	ICAR- NBPGR, New Delhi

Superannuation

Name	Designation	Date
Dr. Madhusudhan Behera	Pr. Scientist	30.04.2023
Sri Narendra Sanchen	SSS	30.04.2023
Sri Uddhab Gayari	SSS	30.04.2023
Sri Chandra Mondal	SSS	31.05.2023

DISTINGUISHED VISITORS

1.	Dr. Himanshu Pathak Secretary, DARE and Director General, ICAR	15.01.2023 18.05.2023
2.	Prof. Swapan Kumar Datta Vice Chancellor of Biswa Bangla University and former DDG (Crop Sci.), ICAR, New Delhi	09.02.2023 14.06.2323
3.	Dr. S. K. Sanyal Former Vice-Chancellor, B.C.K.V., Mohanpur	24.01.2023
4.	Dr. Sain Dass Former Director, ICAR-DMR, New Delhi	14.06.2023
5.	Dr. B. K. Das Director, ICAR-CIFRI, Barrackpore	09.02.2023
6.	Dr. Pradip Dey Director, ICAR-ATARI, Kolkata	09.02.2023
7.	Dr. N. K. Singh National Professor, ICAR-NIPB, New Delhi	14.06.2023
8.	Dr. V. K. Baranwal National Professor, ICAR-IARI, New Delhi	14.06.2023
9.	Sri Dhrubajyoti De, I.P.S. Joint Commissioner, Kolkata Police	2.02.2023
10.	Sri Avanindra Singh, I.A.S Secretary, Fisheries Department, Govt. of W. B.	17.03.2023
11.	Sri Sourav Barik SDO, Barrackpore	2.02.2023
12.	Prof. Timir Baran Jha Former Head of Botany, Presidency University	09.02.2023
13.	Dr. Somsubhra Chakraborty, Associate Professor, Agricultural and Food Engineering Department, IIT Kharagpur	24.01.2023
14.	Prof. V. K. Dhanpuri Former Prof. and Head, CSK HPKV, Palampur	14.06.2023
15.	Prof. R. K. Ghosh Ex Professor, BCKV, Kalyani	14.06.2023
16.	Mr. Debdut Mukherjee Asst. Director, NJB, Kolkata	09.02.2023
17.	Sri Partha Sengupta Director, Agriculture, West Bengal	26.05.2023



Dr. Himanshu Pathak, Secretary, DARE and Director General, ICAR



Prof. Swapan Kumar Datta, Vice Chancellor of Biswa Bangla University with Members of QRT and other Guests



Members of IMC, ICAR-CRIJAF



EDITORIAL

Artificial Intelligence in Jute Agriculture

Artificial Intelligence was introduced in 1956, as the science and engineering of making intelligent machines to find solutions for complex problems. Agriculture is seeing rapid adoption of Artificial Intelligence (AI) and Machine Learning (ML) both in terms of agricultural products and in-field farming techniques. Cognitive computing in particular is all set to become the most disruptive technology in agriculture services as it can understand, learn, and respond to different situations (based on learning) to increase efficiency. Providing some of these solutions as a service like Chatbot or other conversational platform to all the farmers will help them keep pace with technological advancements as well as apply the same in their daily farming to reap the benefits of this service. This initiative has already resulted in 30% higher yield per hectare on farmers' field.

Drone-based Image generation

Precision farming is one of the most discussed areas in farming today. Drone-based images in jute agriculture may help in in-depth field analysis, crop monitoring, scanning of fields and so on. Drone image data can generate alerts in real time to accelerate precision farming. Some areas where Drone-based computer vision technology can be put to use in jute agriculture are:-

Disease detection: Pre-processing of image ensure the leaf images are segmented into areas like background, non-diseased part and diseased part. The diseased part is then cropped and sent to remotelabs for further diagnosis. It also helps in pest identification, nutrient deficiency recognition and more.

Field management: Using high-definition images from airborne systems (drone or copters), real-time estimates can be made during cultivation period by creating a field map and identifying areas where crops require water, fertilizer, or pesticides. This helps in resource optimization to a large extent.

Identification of optimal mix for agronomic products: Based on multiple parameters like soil condition, weather forecast, type of seeds, and infestation in a certain area and so on, cognitive solutions make recommendations to farmers on the best choice of crops and hybrid seeds. The recommendation can be further personalized based on the farm's requirement, local conditions, and data about successful farming in the past.

Crop readiness identification: Images of different crops under white/UV-A light are captured to determine the crop maturity for harvesting. Farmers can create different levels of readiness based on the crop category and add them into separate stacks before going for harvesting.

Health monitoring of crops: Remote sensing techniques along with hyper spectral imaging and 3D laser scanning are essential to build crop metrics across thousands of acres in terms of how farmlands are monitored by farmers both from time and effort perspective. This technology will also be used to monitor crops along their entire lifecycle including report generation in case of anomalies or natural disaster.

Growth driven by IOT (Internet of Things)

Huge volumes of data get generated every day in both structured and unstructured format. These relate to data on historical weather pattern, soil reports, new research, rainfall, pest infestation, images from drones and cameras and so on. Cognitive IOT solutions can sense all these data and provide strong insights to improve yield. Proximity Sensing and Remote Sensing are two technologies which are primarily used for intelligent data fusion.

Soil health assessment: While remote sensing requires sensors to be built into airborne or satellite systems, proximity sensing requires sensors in contact with soil at a very close range. This helps in soil characterization based on the soil below the surface in a particular place.

Automation techniques in irrigation and enabling farmers:

Machines trained on historical weather pattern, soil quality and kind of crops to be grown, can automate irrigation and increase overall yield. With close to 70% of the world's fresh water being used in irrigation, automation can help farmers better manage their water problems. Robotic and automation making right decisions in agricultural activities is less than half the way needed to achieve desired results. The intelligent agents (robots and automatic devices) implementing measures into practice are seen more often as a feasible solution for the future, for increasing technical and economic efficiency and reducing the environmental negative impact of farming. ICAR-CRIJAF has already undertaken a project on IoT in which sensor enabled advanced technological interventions for real time water management in jute based cropping system will be studied for adaptation in farmer's field.

Challenges in AI Adoption in Agriculture

Though Artificial Intelligence (AI) offers vast opportunities for application in agriculture, AI systems need a lot of data to train machines and to make precise predictions. In case of vast agricultural land, though spatial data can be gathered easily, temporal data is hard to get. Since the data infrastructure takes time to mature, it requires a significant amount of time to build a robust machine learning model.

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