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Editors

A. K. Singh,
N. M. Alam, Soham Ray
and S. Satpathy

FROM THE DIRECTOR'S DESK

Ecosystem Services through Jute & Allied Fibres

The ICAR-Central Research Institute for Jute and Allied Fibres (CRIJAF), Barrackpore, a premier Crop research institute of the Indian Council of Agricultural Research (ICAR) is mandated to develop technologies to improve yield and quality of jute and allied fibres. It also remains vigilant and responsive to changing scenario through development of novel technologies and by promoting problem-solving knowledge products for eco-system services. The multi-disciplinary scientific team of the Institute is dedicatedly working now towards development of high quality fibre which can meet the need to make high value diversified products and focusing on many other aspects beyond the traditional use of fibre, rather emphasizing the pharmaceutical, nutraceutical, diversified commercial uses. Research has been emphasized to produce more biomass of sunnhemp with elevated alpha-cellulose content for quality pulp suitable for paper industry. Similarly, R & D on ramie and flax fibre crops have potential to match high quality fabrics required for apparel sector. Sisal and jute fibre with greater strength and durability are the potential raw materials for the manufacturing of cordage, geo-textiles and industrial fabrics. Jute plants are a huge source of renewable bio-mass and can sequester 3.80 t of carbon per ha in soil from the atmosphere which is several times higher than that of trees. These plant based biodegradable natural fibres are the only alternatives which can arrest use of synthetic fibre and can save the trees and environment and hence play a huge role in eco-system services. Development of ramie and sisal based farming systems by the institute not only conserves soil but also secure the livelihood of tribal farmers in degraded land of the country. Some of the recent measures of Government of India like the Compulsory Packaging Act, policy to ban on 'single use plastics', and announcement of revised minimum support price of jute every year will definitely give a fillip to the development of jute sector. Integrated technology support for JAF farming coupled with sensitization through skill development for making of jute diversified products and handicrafts among stakeholders especially the farm women will also lead to economic empowerment. Consumer awareness towards greater use of biodegradable products linked to Government's Clean India initiatives "Swachha Bharat Programme" will sustain the market demand for jute-based products and has the prospect to replace environmentally harmful plastic bags. Keeping these points in view, our multi-disciplinary scientific teams of the institute are dedicatedly working to develop technologies to improve raw jute and allied fibres productivity and its quality. I am confident that our R& D efforts will lead towards inclusive growth of the stakeholders linked and will continue to support millions of farm families for their livelihood besides mitigating impacts of climate change, and imparting role of eco-system services.

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RESEARCH HIGHLIGHTS

Sunnhemp genotypes evaluated for enhancement of crop productivity

Forty two Indian sunnhemp accessions collected from different agro-climatic conditions of the country were evaluated for fibre and biomass yield. Broad spectrum of variability was observed among the genotypes for all the fibre yielding characters.

Genetic variability in sunnhemp accessions

Traits	Mean ±SD	K 12 Black*	Superior lines
Plant height (cm)	312.12 ±16.93	334.00	SIN-28
Basal diameter (mm)	14.03 ±1.88	14.11	SIN-06
Biomass yield (g/plant)	276.98 ±56.21	296.97	SIN-07
Fibre yield (g/plant)	6.68 ±1.99	8.81	SIN-07
Stick yield (g/plant)	48.02 ±11.72	62.28	SIN-07

* check variety

Maruthi, R.T., A. Anil Kumar and J. Mitra
ICAR-CRIJAF, Barrackpore

New JAF varieties released

New high yielding jute and allied fibre crop varieties developed by ICAR-CRIJAF and released for commercial cultivation by Central Varietal Release Committee.

Variety	Salient features	Area of adaptation
Tossa Jute: JROMU 1	• Gamma ray induced mutant selection from JRO 204 • It can produces fibre yield of 33-40 q/ha under high input agriculture • Variety is tolerant to apion, semilooper, BHC, yellow mite and for stem rot disease.	West Bengal, Assam, Bihar and Odisha
HS Mesta: Central Roselle JRHS 1	• Selection from an improved breeding line CRIJAFR 7 • It can produces fibre yield of 26-35 q/ha under high input agriculture • Variety is tolerant to foot & stem rot disease, aphids, white flies, semi-looper and mealy bugs.	West Bengal, Odisha, Bihar, Andhra Pradesh, Maharashtra and Tamil Nadu
HC Mesta: Central Kenaf JRHC 3	• Developed through pure line selection from KIJ-259 • It can produces fibre yield of 29-36 q/ha under high input agriculture • The variety is tolerant to foot & stem rot and Yellow vein mosaic disease of kenaf	West Bengal, Odisha, Bihar, Andhra Pradesh, Maharashtra and Tamil Nadu

Maruthi, R.T., A. Anil Kumar and J. Mitra
ICAR-CRIJAF, Barrackpore

Soil health card (SHC) assessed for judicious use of NPK fertilizer

The study on uses of fertilizer mixture finds that average N:P:K ratio being used in jute-rice-lentil/ mustard/potato is about 1.1:2.6:1 as against recommended NPK ratio of 4:2:1. Farmers apply more amount of NPK complex fertilizer (10:26:26) as compared to Urea, SSP and MoP. Besides $NPK_{10:26:26}$, they also add SSP and MoP in soil for each crop and urea is applied only as top dressing. If farmers apply $NPK_{10:26:26}$ only to meet the 100% P and K and 40% of N requirement of each crop as basal dose, and Neem Coated Urea as top dressing to meet remaining amount of nitrogen then over use of phosphorus can be reduced. In this situation, farmer has to purchase about 4 kg of $NPK_{10:26:26}$ (₹110) and 3 kg of Neem Coated Urea (₹18) as top dressing to meet 1 kg of NPK requirement for each crop at lower cost (₹ 128) as compared to Urea (2 kg)+SSP (6 kg)+MoP (1.5 kg) which cost about ₹600. This combination saves about ₹472 per kg of NPK cost. Crop-wise recommendation of fertilizers provided in the SHC can guide the farmers for judicious use of fertilizer to maintain the soil health.

A.K. Singh, A.K. Ghorai and R. Saha
ICAR-CRIJAF, Barrackpore

New herbicides tested for weed management in jute crop

Ipfencarbazone (PE: 68.43 to 91.24 g ai/ha) as pre-emergence herbicide and Glufosiante ammonium 13.5% SL (10 DAS, 1.2 to 2.2 Kg /ha) and Paraquat dimethoate 24% SL (10 DAS, 1.8 Kg /ha) as post-emergence herbicides could control grass weed population up to 81-83% without affecting jute germination and fibre yield under irrigated condition. In broadcast jute, CRIJAF nail weeder (at field capacity 6-7 DAE) and CRIJAF herbicide applicator using glyphosate @ 2.15 Kg SL/ha (urea 200g/15 lit water) were used for simultaneous weeding, thinning and making line arrangement. Modified nail weeder could reduce the weed population by 66% and herbicide applicator by 80% over control. The jute fibre yield was 38 q/ha and 33 q/ha, respectively.

A.K. Ghorai, Suman Roy and B. Majumdar
ICAR-CRIJAF, Barrackpore

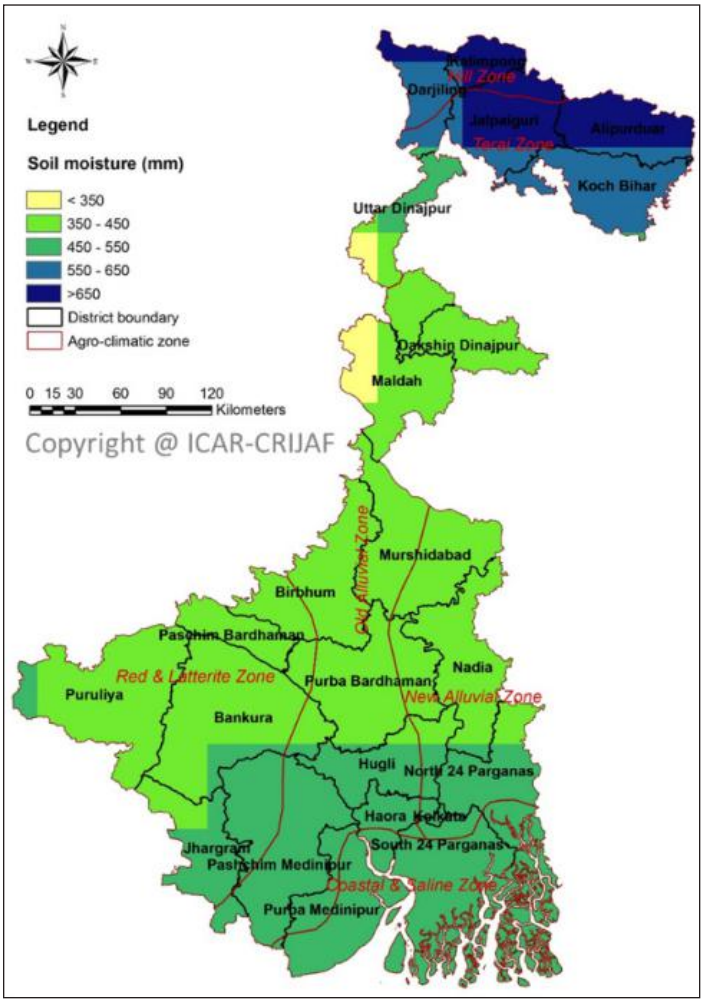
Microbial biomass and enzymatic activities influenced by tillage and residue retention

The effect of conventional tillage and no-tillage (with or without crop residue retention, +R/-R) on soil microbial properties and enzymatic activity (soil microbial biomass carbon; SMBC, Dehydrogenase activity; DHA, Fluorescein Diacetate activity; FDA and β-Glucosidase activity) was evaluated under jute based cropping systems. Irrespective of cropping systems, microbial biomass and enzymatic activities were higher in surface soil (0-15 cm) and decreased with depth in soil. Microbial activities were much higher in no-tillage (+R/-R) as compared to conventional tillage practice. Soil microbial biomass (SMBC) was significantly higher in NT +R (range: 641.84 to 745.97 µg g^{-1}) followed by NT (631.42 to 678.46 µg g^{-1}) and conventional tillage (490.68 to 634.83 µg g^{-1}). However, the differences in enzymatic activities under no-tillage with residue (+R) and without residue (-R) were not significant. Soil microbial and enzymatic activities were much better in jute-rice-lentil followed by jute-rice-wheat and jute-rice-mustard cropping system. Tillage practices and crop residues alter the surface properties of soil invariably affected the soil microbial biomass and enzymatic activities.

R. Saha, B. Majumdar, S.P. Mazumdar, M.S. Behera, D. Barman, A.R. Saha, Laxmi Sharma, and R.K. Naik
ICAR-CRIJAF, Barrackpore

Variability in soil moisture observed during last three decades

Soil moisture trend was analysed over 0.5° x 0.5° NOAA CPC soil moisture gridded data set using Q-GIS and R-Studio for two consecutive periods (1958-1987 and 1988-2017) in the jute growing areas of West Bengal. Monthly trend analysis over first 30-year (1958-1987) of soil moisture data revealed that March soil moisture was in decreasing trend in all the districts. April to July soil moistures were in increasing trend in most of the districts except Malda (-0.05 mm/yr) and Dakshin Dinajpore (-0.17 mm/yr) for April, Alipurduar for May (-0.24 mm/yr) to July (-2.59 mm/yr; -1.35 mm/yr) and Cooch Behar for June (-0.90 mm/yr). However, the August-soil moisture was in decreasing trend in most of the districts. During second 30-year (1988-2017), total soil moisture for jute sowing and establishment period (April & May) was in decreasing trend in Howrah, South 24-Parganas and Purba Medinipore districts. But during fibre development and maturity period of jute (Jun-July), soil moisture was in increasing trend in all the districts of West Bengal.

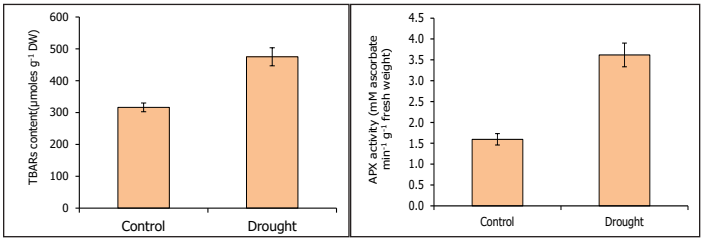


Spatial variability of long-term soil moisture of April & May averaged over 1988 to 2017

D. Barman and R. Saha
ICAR-CRIJAF, Barrackpore

Drought tolerance in jute cultivar (JRO-204) tested under pot culture

The seedlings of jute (JRO-204) were grown in pot and stress was imposed by withholding the irrigation at 30 days. At average soil moisture content of 8% and relative water content of 61% was observed. Membrane injury, proline content and ROS content in jute leaves increased at early onset of drought. There was also increased activity of antioxidant enzymes which states that jute plant activates its antioxidant mechanism to withstand drought conditions.



Lipid peroxidation and Ascorbate peroxidase activity in 30 days jute seedlings under drought condition

L. Sharma, J. Mitra, S. Mitra, P. Satya,
D. Barman and S. Roy
ICAR-CRIJAF, Barrackpore

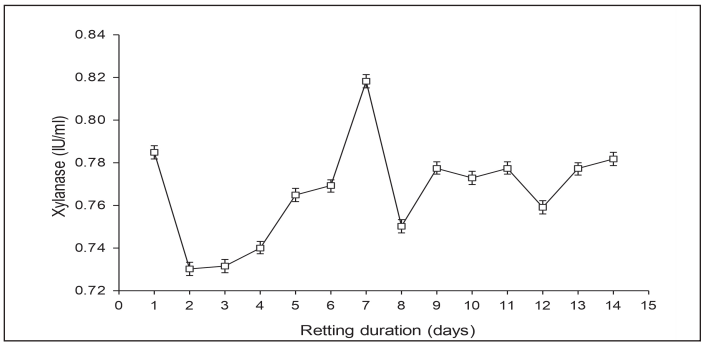
Surface ozone above critical level during early vegetative stage of jute plants

Four jute cultivars (JRO524, JRO204, S19 & NJ7010) were screened for ozone tolerance. Ethylenediurea (EDU) was applied from beginning of vegetative stage until the final harvest phase as a foliar spray in order to protect the plants from the adverse effects of O_3. It was observed that day time O_3 levels was low during the peak vegetative and maturity phase due to the onset of the pre-monsoon period, leading to wash-out of O_3 precursors. However, the hourly O_3 concentrations increased above 'the critical level (40 ppb)' in main vegetative stage.

A.K. Singh, M.S. Behera, S. Roy and R. Saha
ICAR-CRIJAF, Barrackpore

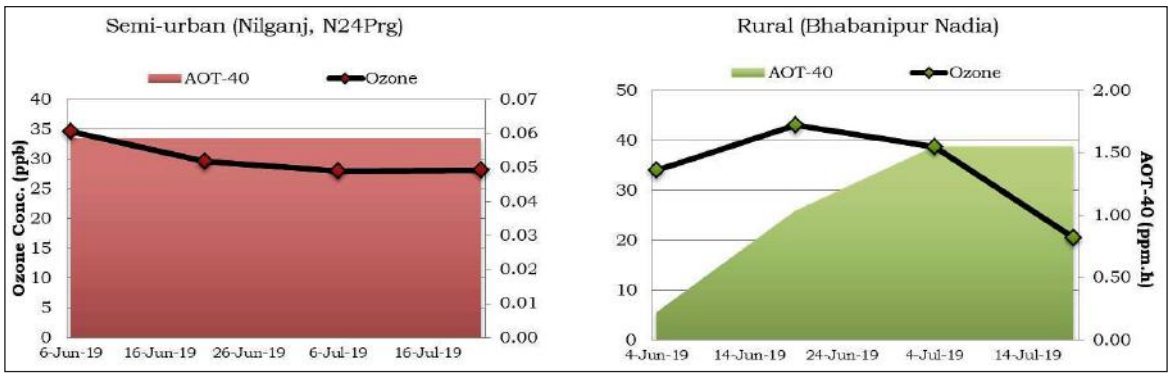
Changes observed in enzymatic activities during retting process of jute

The sequential dynamics of various enzymes involved in jute retting was studied in three stages depending on the changes in pH of retting liquor and enzymatic activity. The initial stage of retting was characterized by a sharp decrease in pH of retting liquor (by 1.35 units) within 24 hrs of retting with microbial consortium and decrease of pectin lyase, polygalacturonase and xylanase activity. During middle stage of retting, the pectin lyase activity recorded higher value of 123.1 U/ml on day 3 and that of polygalacturonase (3.56 IU/ml) and xylanse (0.818 IU/ml) on 7th day of retting. The middle stage of retting was characterized by maximum degradation of pectin, xylan etc. by retting microbes. At the last stage of retting, the polygalacturonase, pectin lyase and xylanase activities were lower and non-significant and the ligno-cellulosic network of fibre was exposed indicating completion of retting. The conventional retting without microbial consortium characterized by reduced enzymatic activities at every stage compared with the microbial consortium; hence the retting process was delayed and took longer duration. The fibre recovery and quality parameters were improved due to application of microbial consortium.



Xylanase activity during jute retting with microbial consortium

B. Majumdar, A.R. Saha, S. Sarkar,
S. K. Sarkar and S. P. Mazumdar
ICAR-CRIJAF, Barrackpore



Ozone concentration during jute growing season (year 2019)

Acaricide evaluation for yellow mite management in farmer's field

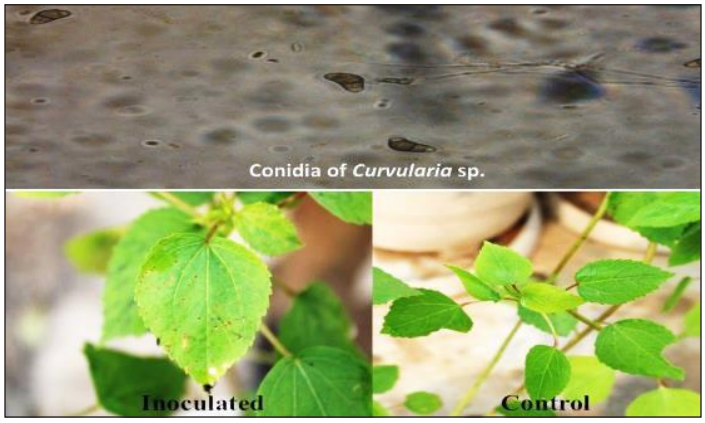
Yellow mite is a major problem that restricts plant growth during early-mid growth phase of jute. Fenpyroximate, a METI acaricide has toxic effect on both immature (egg) and adult stages of mites. Previously standardized dose of fenpyroximate with significant toxic and persistent effect on yellow mite was evaluated under farmer's field at Mallikapur village, North 24 Pgs. Fenpyroximate 5 EC @ 1.5 ml/lit applied at 40 and 55 DAS in jute (cv. JRO 204) significantly reduced the egg and adult mite population, damage grade and plant damage (%). Besides, the treated fields have significantly higher fibre yield (31.98 q/ha) than the untreated field (27.48 q/ha).

Monitoring of mite damage in jute

S. Satpathy, B. S. Gotyal, R.K. De and V. Ramesh Babu
ICAR-CRIJAF, Barrackpore

Leaf spot in mesta caused by *Curvularia* sp.

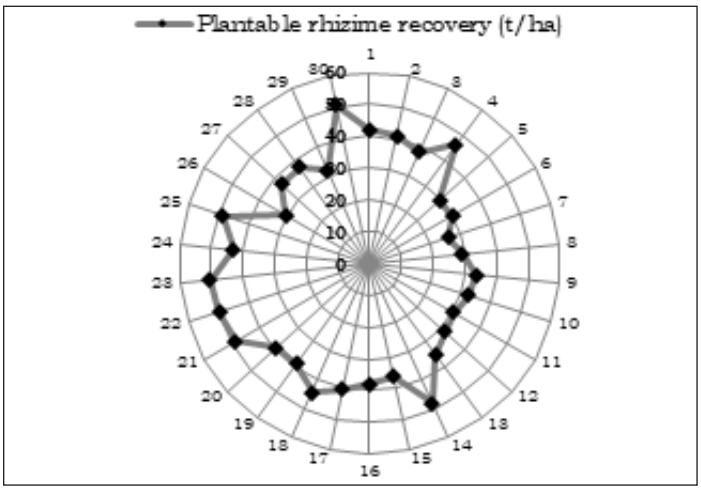
Mesta plants were inoculated at the two leaf stage with a conidial suspension (10^6 spores/ml). Development of external symptoms was observed after 1 week on young leaves. The fungal pathogen was re-isolated and its morphology matched *Curvularia. sp.* This is the first report of *Curvularia* sp. as a pathogen of Mesta in India.



K.V. Shivakumar and S. K. Pandey
ICAR-CRIJAF, Barrackpore

Rate of rhizome recovery assessed in Ramie

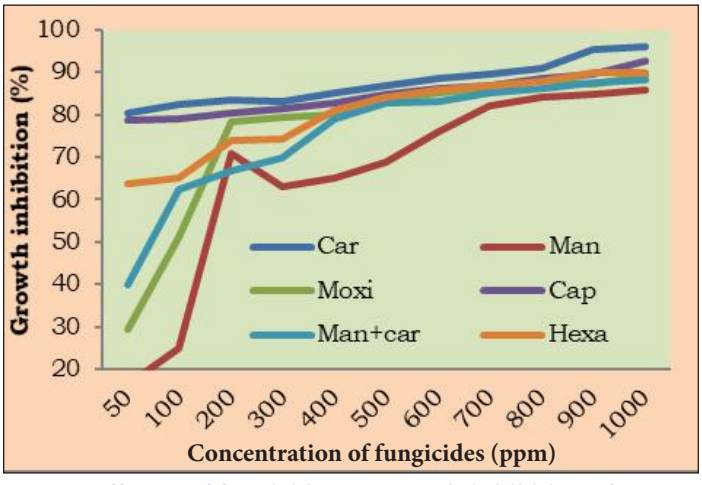
A study on 5-yr old plantation of Ramie (Hazarika variety, R-1114) was carried to find out the rate of rhizome recovery per hectare. It was found that the mean rate of rhizome recovery was 38.67 t/ha. The highest recovery rate was 51 t/ha and the lowest was 25.80 t/ha.



Kajal Das, Monu Kumar and Sitangshu Sarkar
RRS, ICAR-CRIJAF, Sorbhog

Efficacy of fungicides on growth inhibition of *Macrophomina phaseolina* assessed

Carbendazim, mancozeb, moximate, captan, mancozeb+carbendazim and hexaconazole fungicides were tested on growth inhibition of *M. phaseolina* at different concentration using poison food technique. Carbendazim was found to be the best in inhibiting the growth of test fungi even in very low concentration (50ppm) followed by captan.

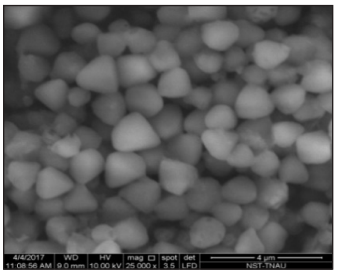


Efficacy of fungicides on growth inhibition of *Macrophomina phaseolina*

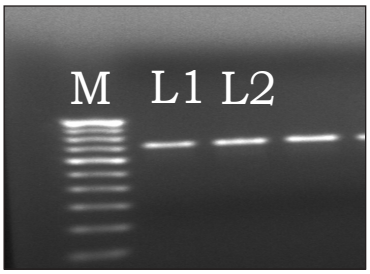
S K Sarkar and Anupam Jana
ICAR-CRIJAF, Barrackpore

*Spob*NPV and AsNPV: Potential biocontrol agents for controlling hairy caterpillar and semilooper in jute

The nucleopolyhedrosis virus was isolated from dead *S. obliqua* larvae from jute plants in farmer's field of Haringhata, West Bengal. The epizootic of NPV on hairy caterpillar was up to the magnitude of 85-90%. The molecular characterization of occlusion bodies revealed that the virus particles are triangular to tetrahedral in shape with an average size of about 1.46 µm. The PCR product after amplification obtained was of 700 bp. The median lethal concentration (LC_{50}) of SpobNPV as 3.2×10^4 OBs/ml.



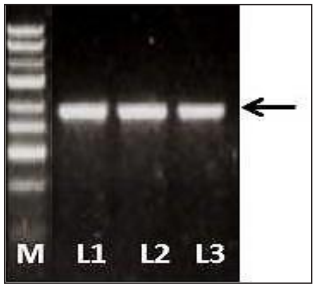
Electron micrographs of OBs



PCR detection (M=Marker; L1 & L2=*S. obliqua* polh NPV gene

In another survey, nucleopolyhedrosis virus was isolated from symptomatic dead larvae of A. *sabulifera* from jute plants in farmer's field of Panji, North 24 Parganas. The PCR product after amplification obtained was of 700 bp. Preliminary mortality studies using leaf dip bioassay with second instar semilooper larvae and serial dilution of the OBs revealed the median lethal concentration (LC_{50}) of AsNPV as 1.03×10^5 OBs/ml (F.L. $1.1x10^5$-$2.3x10^4$).

Larval mortality after infection with AsNPV after 24HAT



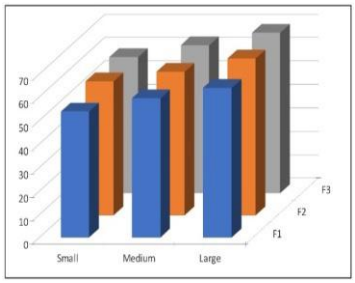
PCR detection (M=Marker; L1 & L2= *A. sabulifera polh* NPV gene

These two nucleopolyhedrosis viruses (Spob NPV and AsNPV) can thus serve as a potential biocontrol agent and alternative to insecticides in minimizing the menace of major lepidopteran pests in jute.

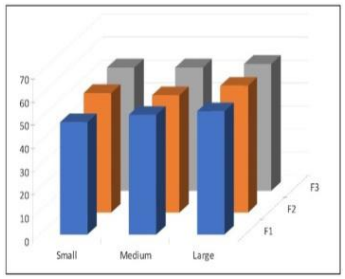
V. Ramesh Babu, G. Siva Kumar* and S Satpathy
*ICAR-CRIJAF & *ICAR-NBAIR*

Interaction effect of planting material and fertilizer dose in sisal leaf size computed

Interaction effect of planting material (sucker) and fertilizer doses were assessed involving three sized planting material (suckers) of Sisalana sisal and hybrid sisal with three levels of fertilizer. In case of sisalana sisal, it was found that the interaction effect of large sucker at planting x higher fertilizer (NPK @120:60:120 kg/ha) dose produced the longest leaf (68.6 cm), which was at par with the medium fertilizer (NPK @ 90:45:90 kg/ha) dose (66.9 cm). The leaf breadth parameter also followed similar pattern of leaf length values. In hybrid sisal, the interaction effect of the large sized planting material with all three levels fertilizer produced at par leaf lengths.



sisalana sisal



hybrid sisal

Effect of planting material and fertilizer dose on leaf length

S. Sarkar, A.K. Jha, M.S. Behera,
B. Majumdar and R.K. Naik
ICAR-CRIJAF, Barrackpore

Line sowing enhanced the jute fibre yield at low cost of cultivation

Advantages of line sowing of jute seed by CRIJAF multi row seed drill (MCSD) was demonstrated in the farmers' field (78 farmers in 12.43 ha) of Habra block, West Bengal. Line sowing helped in vigorous and uniform plant growth and enhanced the average yield by 2.27 q/ha over farmers' practice. In addition, line sowing has reduced the quantity of seed requirement, labour requirement for weeding and saved time for application of fertilizers, pesticides and harvesting process.

Line sowing by CRIJAF-MCSD

S. K. Jha, M. L. Roy, Shamna A., S. Kumar,
R. K. Naik, B. Majumdar and C. S. Kar
ICAR-CRIJAF, Barrackpore

Reduction in labour cost by mechanical weeding

Frontline demonstrations on mechanical weed control by CRIJAF Nail Weeder was conducted in 21.12 ha area of farmer's field in Hooghly district. The demonstration results showed that human labour cost was reduced by ₹14,066/ha as compared to manual weeding.

Farmer operating CRIJAF Nail Weeder in jute field

M. L. Roy, S. K. Jha, S. Kumar, Shamna A.,
C. S. Kar, R.K. Naik & B. Majumdar
ICAR-CRIJAF, Barrackpore

Incidence of Tikka disease of groundnut grown in inter row space of sisal

Groundnut (*Arachis hypogaea* L.), one of the important oil-seed crops was grown in between double rowed sisal plantation during *kharif* season. Groundnut crop was affected by Tikka disease and infection started around 55-57 days after sowing. About 10-50% pod yield loss was observed due to this disease. Application of 2-3 spray application of carbendazim @1 gm or mancozeb or chlorothalonil @ 2 gm per litre of water at 15 days interval starting from 4-5 weeks after sowing could control this disease.

Tikka disease of groundnut in under sisal plantation

A.K. Jha, M.S. Behera and Sitangshu Sarkar
ICAR-CRIJAF, Barrackpore

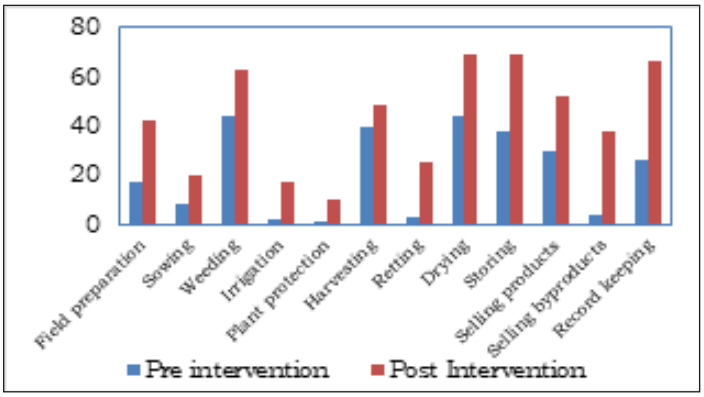
Farmers' perception of climate change and adaptation measures

Based on the model, result of educational attainment, changes in temperature and rainfall significantly influenced farmers' perception of climate change in jute growing areas of West Bengal. Farmers' adaptation decision may be influenced by field demonstration of climate resilient agriculture technology of integrated soil, crop, water, nutrient and post-harvest management. However, the direction of influence and significance level of most of the explanatory variables vary as per the level of awareness among farmers.

M.L. Roy, S.K. Jha, S. Sarkar, A.K. Ghorai,
A.K. Singh, S. Satpathy and A. Chakraborty
ICAR-CRIJAF, Barrackpore

Enhancing tribal farm women's participation in agriculture

The research extension convergence approach for empowering women of Makaltala village, North 24 Parganas had shown that the participation of farm women in various agricultural activities had increased. Sixty farm women were considered for the participatory research and extension. Pre- and post-intervention tests were done to measure the change in farm women participation in field activities.



Pre- and post- technological interventions on differential level of participation of tribal farm women in farming activities

Shamna. A, S.K.Jha, S. Sarkar and R.K. Naik
ICAR-CRIJAF, Barrackpore

Mushroom and vermicompost production using sisal fibre waste

The tow fibre obtained from sisal wastes and rice straw was used for production of Oyster Mushroom. The left over partially decomposed straw and tow fibre was subsequently used for vermicomposting by mixing other crop residues obtained from sisal farm. The vermicompost was utilized for raising intercrops with sisal, thereby reducing the cost on chemical fertilizer and improving soil health. An additional income of ₹ 42720 per year was estimated by mushroom and vermicompost production under a IFS module.

M. S. Behera, R Saha, S. Sarkar and A.K. Jha
ICAR-CRIJAF, Barrackpore

RAC / IMPOPRTANT MEETINGS

RAC Meeting

The Research Advisory Committee (RAC) meeting of ICAR-CRIJAF was held during 24-25th November, 2019 under the Chairmanship of Dr. S.A. Patil, Ex-Director, IARI, New Delhi. The RAC discussed the research activities of the institute and its regional centers. On 25th November 2019, the committee visited Sisal Research Station, Bamra (Odisha) and reviewed sisal based farming system research. The RAC made nine specific recommendations for further strengthening of the research activities of the Institute.

RAC meeting at SRS, Bamra

Meeting of Bangladesh delegates with ICAR-CRIJAF Scientists

A delegation of Bangladesh led by Begum Sabina Yasmin, Joint Secretary, Ministry of Textiles and Jute, Govt. of Bangladesh visited ICAR-CRIJAF and interacted with Scientists on 18 July 2019. The discussion was mainly focused on production, availability of HYV of jute seed; jute retting for quality fibre production using 'CRIJAF Sona'; and farm mechanization of jute cultivation through CRIJAF multi-row seed drill, nail weeder, cycle weeder, etc. Joint Secretary of Bangladesh Ministry of Textiles & Jute extended her thanks to the Director and all the Scientists of ICAR-CRIJAF for sharing scientific knowledge about the improved jute production technology.

Bangladesh delegates at ICAR-CRIJAF, Barrackpore

EVENTS ORGANISED

हिन्दी दिवस कार्यक्रम

भाकृअनुप-केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान बैरकपुर, कोलकाता की राजभाषा कार्यान्वयन समिति के तत्वावधान में दिनांक 13 से 27 सितंबर 2019 तक हिन्दी पखवाड़ा का आयोजन किया गया था जिसमें संस्थान के समस्त अधिकारियों एवं कर्मचारियों ने भाग लिया। इस अवसर पर विभिन्न प्रतियोगिताएं भी आयोजित की गई थी। हिन्दी पखवाड़ा के मौके पर संस्थान के निदेशक ने कहा कि भारत में हिन्दी को राजभाषा के रूप में स्वीकार किया गया है तथा इसका प्रचार- प्रसार अधिक से अधिक करने की जरूरत है। प्रतियोगितायों में अच्छा करने वाले अधिकारियों एवं कर्मचारियों को क्रमशः प्रथम, द्वितीय एवं तृतीय तथा सांत्वना पुरस्कार भी दिया गया।

संस्थान ने 20 दिसंबर 2019 को हिन्दी कार्यशाला का भी आयोजन किया गया था जिसमें संस्थान के अधिकारियों एवं कर्मचारियों ने उत्साह पूर्वक भाग लिया। सीसल अनुसंधान केंद्र, बामरा द्वारा भी दिनांक 31 सितम्बर को हिन्दी दिवस का आयोजन किया गया। इस मौके पर संस्थान के तकनीकी कर्मचारी टी.एस.सी.डब्लू , दैनिक मजदूर एवं किसान ने भाग लिया।

हिन्दी पखवाड़ा हिन्दी एवं कार्यशाला का आयोजन

Independence Day Celebration

Independence Day was celebrated on 15th August, 2019 at ICAR-CRIJAF campus in presence of CRIJAF staffs and their family members. Dr. Jiban Mitra, Director hoisted the National Flag followed by recitation of National Anthem. Director, Head of the Divisions, Scientists, Officers of Administration and Finance, etc. conveyed message of Independence Day on this occasion.

Director, ICAR-CRIJAF hoisting the National Flag

Celebration of World Soil Day

The World Soil Day was celebrated on 5th December, 2019 by ICAR-CRIJAF at Briddhapalla village (Bongaon, North 24 Parganas) of West Bengal. Dr. Jiban Mitra, Director urged the farming community to use the recommendations of the soil health card for better crop production. Dr. B. Majumdar, Principal Scientist explained the importance of soil health and soil testing to the farming community. Dr. S. Satpathy, Head of Crop Protection division emphasized on better management of soil resources. About 430 soil health cards were distributed to the farmers.

Distribution of Soil Health Card to the women during World Soil Day 2019

Vigilance Awareness Week – 2019

Vigilance Awareness Week (VAW)-2019 was observed during 28 Oct to 2 Nov 2019. Integrity pledge was administrated by the Director to all the staffs of the institute. Essay writing competition was held on the theme topic, "Integrity-A way of life" in which participants expressed their views related to the necessity of integrity and vigilance to curb on corruption for building new India. An interface meeting with the suppliers, vendors and service providers of the institute was also conducted to sensitize them about the relevance of VAW. A Vigilance Awareness Quiz competition-cum-sensitization programme was conducted at West Bengal State University, Barasat. A farmers' awareness programme was organized at Mallickapur village in North 24 Parganas district. All the sub-stations of the institute also celebrated the week to create awareness among the staff on vigilance.

Scientists and office staffs being administered integrity pledge

Swachh Bharat Mission- CRIJAF Initiatives

ICAR-CRIJAF, Barrackpore with its Regional Stations and KVKs actively and effectively observed *Swachhta hi Seva* Campaign (11 September, 2019-27 October, 2019) and *Swachhta Pakhwada* (16-31 December, 2019) through various cleanliness oriented activities and awareness programmes. Under *Swachhta Hi Seva*, public meetings in market place, schools and villages were organized to propagate the message for use of biodegradable and environment friendly jute bags in place of plastic. Drawing competition for children was also organized. All the sub-stations of the institute also celebrated the Swachh Bharat Mission in their locality.

Swachhta Hi Seva Campaign

Women Empowerment

ICAR-CRIJAF has taken initiatives to improve the livelihood security, drudgery reduction, skill and entrepreneurship development of farm women. Under SCSP, small farm implements like jute seed drill, nail weeder, single row jute weeder, knapsack sprayer were distributed among 100 farm women to reduce drudgery during the farm operations.

Women participating in weeding and retting process

Considering the economic empowerment of farm women, they were also trained on mushroom production, maintenance of back yard poultry, skill development in jute bag making etc. Knowledge and skill were also imparted on the farm women on various women friendly technologies, poultry and importance of soil test based fertilizer application for increasing farm income. Young rural women were trained for the role of agriculture extension service providers under the Skill India programme of Agriculture Skill Council of India.

Women participating in skill enhancement programme in jute bag making

Mera Gaon Mera Gaurav (MGMG) Programme

MGMG programme was organized in 52 villages of West Bengal. The scientists are grouped in to 11 teams consists of four scientists in each team to conduct MGMG activities. Field demonstrations and advisory services for improved production and retting practices of jute was done. Interface meetings were also organized at villages on soil health management, IPM and other CRIJAF technologies. Extension literatures and inputs like CRIJAF SONA were provided to the farmers. Awareness was created among farmers on use of soil health cards, vigilance, *Swachh Bharat Abhiyan*, etc.

Farmer-Scientist interaction under MGMG programme at Panchkahaniya village, Nadia

Celebration of Constitution Day

Constitution Day' celebration started on 26 November, 2019 with reading of Preamble of Constitution by all the staffs of ICAR-CRIJAF (HQ) and its Regional Research Stations. Various lectures by experts and eminent personalities were organized on topics like 'Constitution Amendments and their significance' at Hingelganj High school, Kolkata, and 'Agriculture Act and Agriculture Legislation and its significance' at State Department of Agriculture. At CRIJAF (HQ), a talk on 'Constitution and Citizen Duties, Land Legislation and Reforms' was also organised. To create awareness on Indian constitution, 'Quiz Competition' was also organized at CRIJAF (HQ).

CRIJAF staffs participating in rally on occasion of Constitution Day

किसान दिवस

सीसल अनुसंधान केंद्र में "किसान दिवस" कार्यक्रम का आयोजन 23 दिसंबर, 2019 को किया गया। कार्यक्रम में भिन्न-भिन्न गाँव के लगभग 50 किसानों ने भाग लिया। केंद्र के प्रभारी डॉ अजीत कुमार झा ने अपने सम्बोधन में किसान नेता एवं पूर्व प्रधानमंत्री स्व. चौधरी चरण सिंह को याद करते हुए देश के विकास में किसानों की भूमिका के बारे में बताया एवं सभा में उपस्थित किसानों की समस्याओं को सुना एवं उसके समाधान के उपायों के बारे में विस्तार से चर्चा किया। इन्होने विशेषतः सीसल की खेती के संबंध में किसानों के साथ वार्ता की एवं अन्य महत्वपूर्ण कृषि-जानकारी भी किसानों के साथ साझा किया। इस आयोजन को सफल बनाने में केंद्र के सभी सहयोगी कर्मियों का योगदान एवं बड़ी संख्या में उपस्थित किसानों की भूमिका अहम रही।

किसान दिवस के अवसर पर किसानो की सहभागिता

Pledge taking ceremony during celebration of Constitution Day at ICAR-CRIJAF, Barrackpore

Sri. Narendra Kumar, Director, DJD addressing the training programme for farmers and extension functionaries on advanced jute production technology

HUMAN RESOURCE DEVELOPMENT

ICAR Short Course Training

The institute organized ICAR sponsored Short Course Training on "Recent Advances in Resource Conservation Technologies (RCTs) under Aberrant Climate Change Scenario" during 14-23 November, 2019. The training programme was based on the most recent topics on latest updates in resource conservation technologies, its application in Indian agriculture, climate change, soil quality, genetic diversity, farm machinery, simulation modelling, application of remote sensing, crop protection aspects, socio-economic issues etc. along with field visits, visits to various laboratories etc. Altogether 23 Scientists/Asstt. Professor/Subject matter specialists from various ICAR institutes and SAUs participated in the training programme.

Ritesh Saha, M. S. Behera and Dhananjay Barman
ICAR-CRIJAF, Barrackpore

Improved retting demonstration with CRIJAF SONA

B. Majumdar, S. Sarkar, S. K. Jha, R. K. Naik, A.R. Saha, R. Saha and S. Satpathy
ICAR-CRIJAF, Barrackpore

Trainees and Resource persons of ICAR short course

Training for master trainer & jute farmers on improved retting technology of CRIJAF

Under Jute-ICARE project, about 44 training-cum-demonstrations of improved retting with CRIJAF SONA formulation were carried out (July-Sept 2019) by the scientists of ICAR-CRIJAF in association with JCI under farmer's field condition in West Bengal, Bihar, Odisha and Assam. Farmers were acquainted with the different aspects of CRIJAF- SONA (microbial formulation) and its application including all precautions while making jak materials. More than 50 farmers participated in each programme and interacted with scientists and other officials (JCI) of respective state and district. A master trainer's programme was also conducted at ICAR-CRIJAF, Barrackpore before start of training-cum-demonstration in farmer's field. The farmers were very enthusiastic about the CRIJAF SONA formulation and its use for quality fibre production in stagnant water.

Training for SC farmers organized

A training for SC farmers of West Bengal was organised on 16th July 2019 at ICAR-CRIJAF, Barrackpore to disseminate the problem solving knowledge and farm input products as developed and standardized in farmer's field by the scientists of ICAR-CRIJAF. Altogether 30 Scheduled Caste farmers of West Bengal participated in the training programme.

Training undergone by the Scientists/Staff Members

Name of the Programme/training	Place and Date	Name of the Participants
Scientists		
ICAR-Sponsored Short Course on Recent Advances in Resource Conservation Technologies under Aberrant Climate Change Scenario	ICAR- CRIJAF, Barrackpore 14-23 November, 2019	Dr. Ajit Kumar Jha, Dr. Kajol Das, Dr. Maruti, R.T. Dr. P.N. Meena
Professional Attachment Training	ICAR-NBPGR, New Delhi 03 Jun - 03 Sept, 2019	Dr. Jitendra Kr. Meena
	ICAR-NIPB, New Delhi 03 Jun - 20 Sept, 2019	Mr. Vikas Mangal
Technical personnel		
Hands-on training in laboratory instrument handling for technical personnel"	ICAR-CRIJAF, Barrackpore, 19-26 September, 2019	Technical personnel

Training/Meeting/Farmer's Interaction organized

Name of the programme/training	Place and Date	No. of participants
Improved crop management and jute retting practices for enhancing farm income (under DST-NRDMS)	ICAR-CRIJAF, Barrackpore 16 July, 2019	30
One day Training Programme for Farmers and Extension functionaries on advanced jute production technology (DJD sponsored)	ICAR-CRIJAF, Barrackpore 28 Aug, 2019	80
ICAR-Sponsored Short Course on Recent Advances in Resource Conservation Technologies under Aberrant Climate Change Scenario	ICAR- CRIJAF, Barrackpore 14-23 November, 2019	23
Farmers' training-cum-demonstration on 'Quality Seed Production of Rabi Crops-Towards doubling farmers' income	CSRSJAF, Budbud 13 December, 2019	75

Demonstration/Awareness programme

Particulars	Place	Date
Farmers' Day-2019	Madhusudanpur, Hooghly, W.B.	14 August, 2019
Demonstrations on improved retting method with CRIJAF SONA and Bast fibre extractor	Madhusudanpur village (Hooghly), Kumra & Kanchiara Village, Beraberi Govt. colony (North 24 Parganas) W.B.	14-23 August, 2019
Parthenium Awareness Campaign	Kanchiara Village, North 24 Parganas, W.B.	20 August, 2019
Training-cum-demonstrations of CRIJAF SONA	Nakashipara, Nadia & Bridhakulla, North 24 Parganas, W.B.	26 August & 2 September, 2019
Farmers – Scientists – RAC members Interface	ICAR-CRIJAF, Barrackpore	13 September, 2019
Awareness campaign on ill effects of plastic and MGMG activity at	Panchkahaniya village, Nadia, W.B.	28 September, 2019
Vigilance awareness programme	Mallickapur Village, North 24 Parganas, W.B.	1 November, 2019
World Soil Day celebration and Soil Health Card distribution	Bongaon, North 24 Parganas, W.B.	5 December, 2019
Sanitation and cleanliness drive under Swachh Bharat Mission	Kharer Math, North 24 Parganas, W.B.	18 December, 2019
Interview with AIR Akashvani about ICAR-CRIJAF technologies and jute as an alternative to minimum use of plastic	Sundarban Kristi Mela-O-Loko Sanskriti Utsab, Kultali, South 24 Parganas, W.B.	24 December, 2019

Particulars	Place	Date
Celebration of Kisan Diwas Experience under Swachh Bharat Mission	Bodai, North 24 Parganas, W.B.	23 December, 2019
Swachcata Awareness under Swachh Bharat Mission	Bodai, North 24 Parganas, W.B.	24 December, 2019
Awareness on waste management	Kharer Math, North 24 Parganas, W.B.	27 December, 2019

Demonstration of Bast fibre extractor

Parthenium awareness programme

DG, ICAR visiting Agri-exhibition stall of ICAR-CRIJAF at ICAR-NRRI, Cuttack

Exposure visit of UBKV students at CRIJAF

Participation in agri-fairs, exhibition and exposure visits

Particulars	Place	Date
34th Annual Titumeer Fair	Vikas Kendra, Athghara, North 24 Parganas, W.B.	17-19 November, 2019
Exposure visit of 25 farmers from Pakur, W.B.	Mobile Agriculture School and Services, Ranchi	21 August, 2019
Exposure visit of 30 students from UBKV	ICAR-CRIJAF, Barrackpore	2 November, 2019
Agri-Exhibition	ICAR-NRRI, Cuttack	6 December, 2019
Monomohan Mela o Lokosanskriti Utsav	Chhoto Jagulia, North 24 Parganas, W.B.	15-22 December, 2019
Sundarban Kristi Mela-O-Loko Sanskriti Utsab	Kultali, P.O.Basanti, Dist. South 24 Parganas, W.B.	20-29 December, 2019

Seminar/Symposium/Conferences attended

Programme	Institute and Date	Name of the Participant
National Workshop on "Jute- Strategies for development" organized by Directorate of Jute Development, Kolkata	Science City, Kolkata, July, 25, 2019	Jiban Mitra, S. Mitra A.K. Ghoari B. Majumdar C. S, Kar
National Conference on Doubling Farmers Income for Sustainable & Harmonious Agriculture(DISHA-2019)	BAU, Ranchi 10-11 August, 2019	Ajit Kumar Jha

Programme	Institute and Date	Name of the Participant
India International Science Festival	BB Convention Centre, Kolkata 5-8 November, 2019	S. Satpathy S. K Jha Subhojit Datta Ranjan Naik Sonali P. Mazumder Shamna. A. Manik Lal Roy S. RoyLaxmi Sharma
International Conference on "Soil and water resources management for climate smart agriculture, global food and livelihood security"	NAAS Complex, New Delhi, 5-9 November, 2019	Bijan Majumdar Ritesh Saha S. Sarkar M.S.Behera
XIX International Plant Protection Congress IPPC2019 on Crop Protection to Outsmart Climate Change for Food Security & Environmental Conservation	ICRISAT, , Hyderabad, 10-14 November 2019	S. Satpathy R.K.De S.K. Sarkar B.S. Gotyal V. Ramesh Babu
International Seminar on Agriskills for Convergence in Research, Industry and Livelihood	BCKV, Kalyani 28 Nov to 1 Dec, 2019	Sonali Paul Mazumder Ranjan Naik NM Alam Shamna, A. S. Sarkar
National Symposium on potential crops for food and nutritional security	Tamil Nadu Agricultural University, Coimbatore, 14-15 December, 2019	R.K. Dey S.K. Pandey

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Sarkar, S., Behera, M.S., Bera, A. and Sarkar, S.K. (2019). Yield and quality of jute seed as influenced by method of application and dose of fertilizer nutrients in southern Bengal condition. In: International Seminar on "Agriskills for Convergence in Research, Industry and Livelihood (ACRIL-2019)" during 28 Nov to 1 Dec, 2019, BCKV, Kalyani, West Bengal. p. 6.

Satpathy, S., Gotyal, B.S. and Ramesh Babu, V. (2019). Host suitability of kenaf varieties and germplasm lines for resistance against cotton mealybug, *Phenacoccus solenopsis* Tinsley. In: Proceedings of XIX International Plant Protection Congress (IPPC) – 2019 on Crop Protection to Outsmart Climate Change for Food Security & Environmental Conservation during 08- 12, Nov, 2019, ICRISAT, Hyderabad, pp. 135.

Ramesh Babu, V., Satpathy, S., Gotyal, B.S. and Subba Reddy, B.V. (2019). Characterization of female sex pheromone components of jute semilooper, *Anomis sabulifera* Guenee. In "XIX International Plant Protection Congress IPPC 2019" during 10-14 November, 2019, Hyderabad, India. pp. 256.

AWARDS AND RECOGINITIONS

Awards

- Dr. B.S. Gotyal awarded with Dr. B. Vasanthraj David Young Scientist Award for research contribution in jute entomology on November 17, 2019.
- Dr. D. Barman awarded with 'Outstanding Scientist Award' for the year 2019 conferred by Venus International Foundation, Chennai, India for his contribution and achievements in the field of Agricultural Physics on August 03, 2019.
- Dr. Ranjan Naik awarded with 'Best Researcher Award' conferred by VD Good International Society, Chennai in the 2nd International Award Ceremony at Viskhapatnam on November 16, 2019

Dr. Ranjan Nayak receiving Award

- Dr. S. Satpathy, Head, Crop Protection Division was awarded with 'Scientist Award – 2019" conferred by Dr. B. Vasanthraj David Foundation, Chennai for his contribution to Agricultural Entomology, Plant Health Management, Biological Control and IPM at Chennai on November 17, 2019.
- Dr. M.S. Behera awarded with 'Best Poster Award' for research paper entitled 'Integrated Farming System in Sisal Plantation for sustainable production'. In: International Conference jointly organized by Soil Conservation Society of India, World Association of Soil and water conservation and International Soil Conservation Organization, November 5-9, 2019, New Delhi
- Dr. D. Barman awarded with 'Best Poster Award'. Presented in: International Seminar on Agriskills for Convergence in Research, Industry and Livelihood organized by Crop and Weed Science Society, BCKV, Kalyani, Nadia, West Bengal, 28 Nov to 1 Dec, 2019.
- Dr. S.P. Mazumdar awarded with Best Oral Presentation Award for the paper "Influence of organic and inorganic source of nutrients on the functional diversity of microbial communities in jute based cropping system in the Eastern region of the Indo-Gangetic plains" Presented in: International Seminar on Agri-skills for Convergence in Research, Industry and Livelihood organized by Crop and Weed Science Society, BCKV, Kalyani, Nadia, West Bengal, 28 Nov to 1 Dec, 2019.
- Dr. Shamna A. awarded with Best Poster Award for the poster presentation on 'Farm women empowerment through Research and Extension convergence approach'. Presented in: International Seminar on Agri-skills for Convergence in Research, Industry and Livelihood organized by Crop and Weed Science Society, BCKV, Kalyani, Nadia, West Bengal, 28 Nov to 1 Dec, 2019.

Recognitions

- Dr. S. Sarkar, Pr. Scientist nominated as
  - Academic Editor of *World Research Journal of Agronomy*, ISSN: 2320-3404; Published by Bioinfo Publication.
  - Editorial Board Member, *Indian Journal of Science and Technology*.
  - Editorial Board Member, *ARPN Journal of Science and Technology*.
  - as Councilor of Indian Society of Coastal Agricultural Research (ISCAR) for West Bengal.
- Dr. S.K. Sarkar, Principal Scientist, ICAR-CRIJAF nominated as
  - member of Peer Review Team of NAEAB (ICAR) for evaluating UAS, Raichur and its various colleges and degree programme, for Accreditation.
  - member of DPC for selection of press and editorial and workshop staff (Cat III) at CIFRI by ASRBMember of Advisory Committee, Neotia University, Kolkata

JAF-Safe mobile app released by Hon'ble Minister of MoA&FW, GoI

DISTINGUISHED VISITORS

Name of the Visitor	Affiliation	Date
Begum Sabina Yasmin	Joint Secretary, Ministry of Textiles and Jute, Govt. of Bangladesh	18 July, 2019
Prof. Basab Chowdhury	Vice-Chancellor, West Bengal State University, Barasat	17 Sept, 2019
Dr. N.C. Pan	Director, ICAR-NINFET, Kolkata	25 Nov, 2019
Dr. S.A. Patil	Chairman, RAC, ICAR-CRIJAF & Former Director, IARI, New Delhi	
Dr. R.K. Singh	Assistant Director General (Comm. Crops), ICAR, New Delhi	
Prof. Tapas Dasgupta	Ex-Professor (Genetics & Plant Breeding), Calcutta University	

Dr. S.K. Patil, Chairman RAC releasing CRIJAF Publications

Prof. Basab Chowdhury, distributing planting material on the occasion tree plantation programme of CRIJAF

PERSONNEL

Promotion

Name	Designation	Promoted to	w. e. f.
Dr. Asim Kr. Chakraborty	Scientist	Scientist (SS)	29.08.2001
Mr. Ranjan Das	Lower Division Clerk	Upper Division Clerk	23.10.2019

Superannuation

Name	Designation	Date of Retirement	Place of Posting
Dr. D.K. Kundu	Pr. Scientist	31.07.2019	CRIJAF, Barrackpore
Mr. B. Ghosh	Technical Officer	30.11.2019	
Mr. O.P. Choudhury		31.08.2019	
Mr. A.N. Dey		31.08.2019	
Mr. Sankar Shome	Assistant	30.11.2019	
Mr. D.N. Kundu	Skilled Supporting Staff	30.06.2019	CSRSJAF, Budbud
Mr. Anukul Poddar		31.12.2019	CRIJAF, Barrackpore
Mr. Sanat Bagdi		30.04.2019	CSRSJAF, Budbud
Mr. Chinta Haran Das		31.07.2019	RRS, Sorbhog
Mr. Sadhu		31.12.2019	SRS, Bamra
Mr. Charan Mandal		31.12.2019	CRIJAF, Barrackpore
Mr. Pradip Mandal		31.12.2019	CRIJAF, Barrackpore

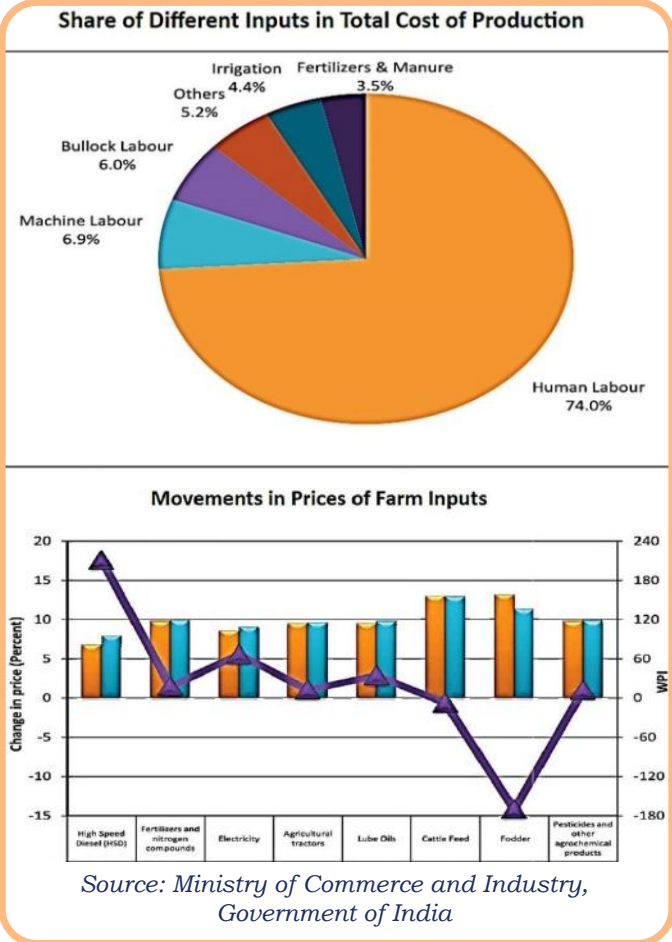
Transfer

Dr. P.N. Meena	Sr. Scientist (Plant Pathology)	Transferred to NCIPM w.e.f. 23.11.2019
Mr. M. Ramesh Naik	Sr. Scientist (Agronomy)	Transferred to NAARM w.e.f. 02.12.2019

EDITORIAL

Doubling Farm Income for Jute Growers

Resource use efficiency and cost of cultivation are important from the perspective of enhancing net returns from agricultural activity. The cost of cultivation of crops has been increasing over the years because of increase in wages of labours, input prices and other farm management costs. Decline in soil organic carbon, multi-nutrient deficiencies due to imbalanced use of fertilizers and low nutrient-water use efficiencies has further aggravated problems. Lowering the costs without compromising on the output and proper soil and crop management practices can brings long term positive transformation in farmers' income and the agricultural economy. Therefore, innovating crop and farm input managerial solutions rather than relying solely on modern farming to raise productivity and production would be a preferred option.



Source: Ministry of Commerce and Industry, Government of India

Jute and rice are the major crops of Eastern Indian states (West Bengal, Bihar, Odisha and Assam). These states account for 98.41% area under jute cultivation, as well as 98.43% of total raw jute production. Major portion of the increased rice production come from the high rainfall with low irrigation potential areas (8-10 million ha) of the region. But, the annual income from jute and rice cultivation is relatively low. Income can be enhanced by increasing the efficiency of the production inputs used in the farming. Proper land preparation to ensure optimum crop stand, timely planting of appropriate crop varieties, balanced fertilization, control of menacing weeds, disease and insects and proper rain and irrigation water management can certainly increase the input use efficiency. The jute and rice yield gap could be narrowed further by using an integrated management system that optimize field practices and soil productivity.

As per ICAR-CRIJAF study in farmer's field, crop diversification through integrated crop and nutrient management increases the cropping intensity, generates additional return, and reduces the human labour, water and nutrient requirement of crops in the rotation. Jute intercropped with green gram can provide the better weed control (>50%) and reduction in human labours for weeding along with improved protein nutrition to farmer's family and plant nutrient to maintain soil health. Water productivity of rice field can also be increased if remunerative vegetable crop is grown on gunny bag reinforced soil column in rice field. Use of farm implements for sowing and weeding reduces the seed and labour requirement up to 50%. Soil test based fertilizer management, IPM and uses of talc-based microbial formulation for retting plays a significant role in reducing the fertilizer, pesticides and retting water requirement without affecting the quality and productivity of crops. Thus, higher yield and profit (>85%) could be realized by the farmers with the introduction of integrated soil, water, crop and nutrient resources to the most optimal level possible. Such resource use technology brings long term positive transformation in farmers' income and the agricultural economy in jute growing areas.

During COVID-19 lockdown period, farmers should follow social distancing, safety measures and maintain personal hygiene by washing of hands with soap, wearing of face mask, and protective clothing at each and every step in the entire process of field operations in order to prevent spread of COVID-19 virus.

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