ALL INDIA NETWORK PROJECT ON JUTE AND ALLIED FIBRES

ICAR-CENTRAL RESEARCH INSTITUTE FOR JUTE AND ALLIED FIBRES
An ISO 9001:2008 Certified Institute
(Indian Council of Agricultural Research)
Barrackpore, Kolkata - 700120, West Bengal
www.crijaf.org.in

Correct Citation

Mitra, S., Pandey, S. K., Maruthi R. T., Sharma, H. K., Anil Kumar, A., Bera, Amit, Kumar, Mukesh, Majumdar, S. P., Singh, Amarpreet, Gotyal, B. S., Selvaraj, K., Meena, P. N., Jha, A. K., Sharma, A. K., Chaudhary, B. and Kumar, S. 2015. Annual Report 2014-15. All India Network Project on Jute and Allied Fibres, Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata – 700 120, 220 p

Editing

S. Mitra, S. K. Pandey, R. T. Maruthi, A. Anil Kumar, H. K. Sharma, Amit Bera, Mukesh Kumar
S. P. Majumdar, Amarpreet Singh, B. S. Gotyal, K. Selvaraj, P. N. Meena
A. K. Jha, A. K. Sharma, B. Chaudhary and S. Kumar

Compilation

Crop Improvement

S. K. Pandey, P. Satya, Jiban Mitra, C. S. Kar, A. Anil Kumar
H. K. Sharma, R. T. Maruthi and Amit Bera

Crop Production

D. K. Kundu, A. R. Saha, B. Majumdar, Mukesh Kumar
S. P. Majumdar and Amarpreet Singh

Crop Protection

S. Satpathy, K. Mondal, B. S. Gotyal, K. Selvaraj, P. N. Meena and A. N. Tripathi

Fibre Quality

S. C. Saha

Tribal Sub Plan

S. K. Pandey and S. Mitra

Statistical Analysis

A. Chakraborty and M. Saha

Word Processing

D. K. Barua, A. Mondal, B. Adhikary and B. Ghosh

Hindi Translation

S. K. Jha, A. N. Tripathi, S. Kumar, Mukesh Kumar, M. K. Roy and N. K. Singh

Published by

P. G. Karmakar, Director
Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata – 700 120

Printed at

Eastern Printing Processor
93, Dakshindari Road, Kolkata – 700 048

Materials for this report are provided by the concerned scientists of the AINP on JAF centres and scientists of CRIJAF through the respective Head of Divisions

Contents

From the Director's Desk

All India Network Project for Jute and Allied Fibres (AINPJ&AF) under the leadership of ICAR- CRIJAF, Barrackpore have played a crucial role in overall development of jute, mesta, sunnhemp, ramie, sisal and flax crops. The network project with its headquarter at ICAR-CRIJAF, Barrackpore coordinates the multi-disciplinary and multi-location testing of varietal improvement, crop protection and crop management technologies across diverse ecosystems for increasing and stabilizing production of jute as well as allied fibre crops in the country. The long journey of AINPJ&AF together with 9 State Agricultural Universities (SAUs) and 4 ICAR institute based centres had been quite eventful with several successes to its credit. With 58 improved cultivars in these crops (37 in jute, 17 in mesta and 4 in sunnhemp), the national productivity in jute, mesta and sunnhemp had not only been doubled but was also sustained over years despite of the diminishing total factor productivity across the regions. The network project had also catered to the industrial demand for finer fibre of jute, by identifying high quality tossa jute varieties suitable for manufacturing of value added products. With the identification of flax and ramie varieties suitable to Indian conditions, we have successfully added to the natural fibre crop basket of the country. Improvement of retting technology remained a grey area with multiplier effect on fibre quality as well as sustainability of these natural fibre crops. Multi-location testing of microbial consortium based retting technology developed by ICAR-CRIJAF (CRIJAF Sona) in jute and mesta growing regions through AINP had brought significant improvement in fibre quality and had also fetched higher price of the fibre in the market. Further, popularisation of precise and cost effective crop husbandry practices filtered out of this project has the potentiality to enhance profitability of these crops with obvious socio-economic implications.

With the mounting concern for livelihood security of jute and allied fibre growing farmers in the changing climate scenario, scientists in this sector need to be armoured with cutting edge technologies like biotechnology, nano-technology and remote sensing which will help to overcome anticipated threats and achieve desired level of yield and quality of jute and allied fibre crops.

I, sincerely thank the scientists of AINPJ&F and ICAR-CRIJAF for their relentless efforts that kept jute and allied fibre crops glittering despite of all odds. I am fully confident of their ability to address these emerging challenges and hope that the workshop will bring together all the stakeholders of jute and allied fibres sector for enriched discussions and meaningful conclusions which will chalk out future plan of translational research in the sector.

P. G. Karmakar

Place: Barrackpore
Date: 10. 02. 2015

(P. G. Karmakar)
Director

Preface

The All India Network Project on Jute and Allied Fibres is playing an important role in developing high yielding varieties of jute and allied fibre crops along with their suitable production and protection technologies for different states of the country. Major emphasis had been given on weed management as weeding consumes about 30-35% of the cost of cultivation. Major weeds of different jute growing regions had been identified through exhaustive survey and integrated weed management modules had been developed and recommended for the regions accordingly. With the change in rainfall pattern during jute growing season, the quality of fibre is deteriorating fast and development of an eco-friendly retting technology with low water requirement is the need of the hour. The scientists of ICAR-CRIJAF and the AINPJAF centres have done a commendable job in testing and fine tuning the microbial retting technology developed in ICAR-CRIJAF across the country. Soil test based fertilizer application with region specific yield targets had enabled us to reduce the cost without affecting the productivity of the system. Similarly, integration of locally available organic sources or even waste biomass of the crops after proper decomposition, has led to development of suitable integrated nutrient management schedules for jute, mesta, sunnhemp, sisal and ramie. Inclusion of new pesticide molecules in our IPM modules had helped in developing effective pest and disease management strategies. Six varieties of jute and allied fibre crops, viz. JROG-1 (tossa jute), JMBG-4 (kenaf), CRIJAFR-2 and CRIJAFR-8 (roselle), JRJ-610 (sunnhemp) and JRF-2 (flax) had been identified in the 11th Annual Group Meeting of AINPJAF at UBKV, Coochbehar.

This year also, Tribal Sub Plan programme had been conducted in 85 ha area in Coochbehar, Alipuduar and 24 Parganas district of West Bengal; Nagaon and Morigaon districts of Assam and Keonjhar district of Odisha involving 338 small and marginal tribal farmers. We had successfully demonstrated improved production and protection technologies of jute as well as the microbial retting technology which had not only increased the productivity but also improved fibre quality and fetched about Rs. 300 – 500 more price per quintal of fibre in jute.

I, sincerely acknowledge the contribution of the scientists of ICAR-CRIJAF and all the centres of AINP on Jute and Allied Fibres in executing the programme of AINP successfully. I am thankful to Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR for his leadership and direction. I am also thankful to Prof. S. K. Datta, former Deputy Director General (Crop Science), Dr. J. S. Sandhu, present Deputy Director General (Crop Science), Dr. N. Gopalakrishnan, Assistant Director General (Commercial Crop), Indian Council of Agriculture Research, New Delhi for their guidance and support. I also convey my sincere thanks to Dr. P. G. Karmakar, Director, ICAR-CRIJAF for his support in smooth functioning of AINPJAF.

Place: Barrackpore
Date: 10.02.2015

(Sabyasachi Mitra)
In-Charge, AINP J&AF

Executive Summary

Crop Improvement

A total of 26 projects comprising of 118 trials were evaluated on jute and allied fibre crops at different centres of All India Network Project on Jute and Allied Fibres under crop improvement programme. Twelve projects for jute, eight for mesta, three for sunnhemp, two for flax and one project for ramie were evaluated which includes germplasm evaluation, national hybridisation programme and multilocation yield evaluation trials (IETs, AVT-Is and AVT-IIs).

Release proposal of six varieties *viz.,* JROG-1 of *tossa*jute, JMBG-4 of kenaf, CRIJAF R-2 and CRIJAF R-8 of roselle, JRJ-610 of sunnhemp and JRF-2 of flax identified during the 11th Annual Group Meeting have been submitted to CSCSN&RV for their release.

Evaluation of jute germplasm

Seventy five accessions of *Corchorus capsularis* were screened for fibre yield and yield components in six locations. An overall mean of 9.8±1.6 g/plant was recorded for fibre yield over the five locations with a range of 7.0 g/plant (CEX-15) to 12.4 g/plant (CIN-364). Three genotypes, CIN-364, CIN-367 and CIN 138 outperformed JRC 517.

Seventy five accessions of *Corchorus olitorius* were screened for fibre yield, plant height, green weight and basal diameter in six locations. Average fibre yield over the locations was recorded to be 10.0±0.9 g/plant with a range of 8.5 to 12.4 g/plant. Twelve genotypes outperformed check variety JRO 204 for fibre yield.

Evaluation of mesta germplasm

158 accessions of *Hibiscus sabdariffa* were tested in two locations for fibre yield and yield components. Seven accessions exhibited higher fibre yield than AMV 5. Seventy five accessions of kenaf were tested at Aduthurai. Only one accession, KIJ-164 outperformed check variety AMC 108 for fibre yield.

National Hybridization Programme (NHP)

F_4 progenies of *C. capsularis* cross combinations were evaluated in five centres. Progenies of the cross combination CIN-149 × JRC 321 recorded highest fibre yield at Kalyani and progenies of CIJ-100 × JRC 212 surpassed check JRC 698 for green biomass and fibre yield. F_3 progenies of *C. olitorius* different cross combinations were evaluated in five centres. The 36 progenies at five locations exhibited a mean fibre yield of 9.2±0.9 g/plant. Progenies from OIJ-015 X OIN-028 exhibited highest fibre yield over locations surpassing best check JRO 204. A total of 43 crosses of *C. olitorius* have been advanced to F_2 generations. A total of 22 crosses in *C. capsularis* have been developed.

A total of 150 F_4 progenies of roselle were evaluated at Amadalavalasa centre. Selection of 194 progeny plants have been carried out for advancement in next generation.

Yield Evaluation Trials

Tossa jute (*C. olitorius*)

IET: Check variety JRO 524 recorded 36.15 q/ha of fibre yield whereas, NJ-7050 stood second (34.01 q/ha) and closely followed by another check variety JRO 8432 (33.74 q/ha).

AVTI: Five test entries with two checks namely, JRO 524 and JRO 8432 were tested for fibre yield at seven locations. Check variety JRO 8432 turned out to be the best performer and recorded 31.36 q/ha fibre yield followed by NJ-7005 (28.87 q/ha).

AVTII: Pooled analysis of average yield over locations and years (grand) revealed that KRO-4 recorded the highest fibre yield (27.73 q/ ha) followed by check variety JRO 8432 with fibre yield of 27.09 q/ha.

White jute (*C. capsularis*)

IET: Trial was constituted with 8 test entries including two checks namely, JRC 517 and JRC 698 and conducted over seven locations. Test entry BCCC-4 turned to be the best performer with fibre yield of 32.76 q/ha.

AVTI: The trial was comprised of four test entries and two check varieties JRC 698 and JRC 517 and was conducted over seven locations. BCCC-3 (25.35 q/ha) recorded highest fibre yield followed by NCJ-28-1-1 (25.23 q/ha).

AVT II: Based on pooled analysis, test entry BCCC-2 (25.57 q/ha) was the best among all test entries followed by NCJ-28-14 (25.15 q/ha) and JRCJ-3 (24.79 q/ha).

Roselle (*H. sabdariffa*)

IET: Six test entries and two check varieties were evaluated in seven locations. Test entries JRHS-2 (27.79 q/ha) and JRHS-1 (27.29 q/ha) turned out to be significantly superior over the best check AMV 5 (25.79 q/ha).

AVTI: Four test entries with two checks were tested for fibre yield in seven locations. Test entry AHS-49 was found to be the best performer with 24.77 q/ha fibre yield. This was followed by JRR-2012-1 which recorded 23.46 q/ha fibre yield.

AVT II: Considering mean performances over locations and year (grand) test entry AHS-230 recorded the highest fibre yield (27.87 q/ha) followed by AHS-233 (25.94 q/ha).

Kenaf (*H. cannabinus*)

IET: The trial was conducted with four test entries and two checks namely, HC 583 and AMC 108 over seven locations. Check variety AMC 108 (33.98 q/ha) was found to be the best performer which was very close to the test entry JRK-2013-1 (33.90 q/ha).

AVT I: The trial was conducted with four test entries along with two checks namely, HC 583 and AMC 108 at seven locations. Test entry JRK-2011-2 (26.43 q/ha) outperformed the best check variety AMC 108 (25.83 q/ha) followed by JRK-2011-1 (25.80 q/ha) and JRK-2011-4 (24.15 q/ha).

Sunnhemp (*C. juncea*)

IET: The trial was conducted with six test entries along with two checks over five locations. Entries Sanai-11 (11.87 q/ha), Sanai-12 (11.47 q/ha) and JRS-2013-1 (11.43 q/ha) were better performing entries over both the checks.

AVT I: The trial was conducted with four promising entries and two checks over five locations. None of the test entries performed better than the best check SH 4 (10.17 q/ha).

AVT II: Pooled analysis of data showed that test entry SUIN-5 (9.30 q/ha), SUIN-3 (9.09 q/ha), SUIN-4 (8.75 q/ha) and SUIN-1 (8.69 q/ha) performed better than the best check SH 4 (8.42 q/ha).

Ramie (*B. nivea*)

AVT I: Test entry R-1415 produced maximum fibre yield (15.59 q/ha/yr) at Sorbhog whereas maximum green weight (634 q/ha/yr) was yielded by test entry R-1518 with less dry fibre recovery (1.9 %).

Flax (*L. usitatissimum*)

IET: Trial was conducted with five test entries along with one check. Entry JRF-13 (17.9 q/ha) and JRF-10 (17.1 q/ha) performed better than check variety JRF 2 (15.7 q/ha) at Pratapgarh.

AVT I: Test entry JRF-9 (97.76 cm) attained maximum plant height followed by JRF-8 (94.33 cm) and JRF-6 (92.19 cm).

Adaptive trials

White jute: Test entry NDJC-2011 (26.12 q/ha) surpassed the best check JRC 517 (25.78 q/ha) by 1.30%.

Kenaf: JBMP-1 (27.80 q/ha) out-yielded national checks AMC 108 and HC 583 by 6.94 % and 1.46%, respectively.

Roselle: Entry AHS-216 (21.54 q/ha) out-yielded national check AMV 5 (19.54 q/ha) by 10.24%, in farmer's field of Maharastra.

Sunnhemp: Test entry SUIN-62 (14.07 q/ha) out yielded the best check SUIN 053 (9.66 q/ha) by 45.70% yield superiority in farmers' fields of Uttar Pradesh.

Flax: Test entry JRF-4 with average yield of 18.20 q/ha raw fibre surpassed the yield potential of JRF 2 (16.59 q/ha) by 9.67%.

Crop Production Executive Summary

In the year -2014-15, total 15 research projects comprising of 53 trials were conducted on jute and allied fibre crops at different AINP centres under crop production programme.

The new *C. capsularis* genotype under adaptive trial, NDJC-2011, recorded significantly higher fibre yield over check varieties at Bahraich, Uttar Pradesh only. The fibre yield of *capsularis* jute varieties increased significantly upto 80:17.5:33.3 kg NPK/ha at Barrackpore, West Bengal and upto 100:21.8:41.7 kg NPK/ha at Kalyani, West Bengal and Bahraich, Uttar Pradesh, respectively. The kenaf entry JBMP-2 recorded significantly higher plant height and fibre yield (9.31 q/ha) over the test variety, HC 583 at Amadalavalasa, Andhra Pradesh only. Fibre yield of kenaf varieties increased significantly upto 60:13.2:25 kg NPK/ha level at Amadalavalasa and Kendrapara centres and upto 80:17.5:33.3 kg NPK/ha at Bamra, Odisha. However, none of the new roselle genotypes (JBRP-01 and AHS-216) under adaptive trial recorded any significant increase in fibre yield over the check variety AMV 5 at both Aduthurai and Amadalavalasa centres. Fibre yield of roselle genotypes increased significantly upto 60:13.2:25::N:P:K kg/ha level at Amadalavalasa centre only. Fibre yield of new sunnhemp entry SUIN-62 was significantly higher over the check varieties SH 4 at Pratapgarh centre only and the fibre yield increased significantly upto 20:40:40 kg NPK/ha dose.

Soil test and targeted yield based fertilizer application recorded higher fibre yield of jute over recommended doses of fertilizer (RDF) at Bahraich and Katihar. Similarly, ST-TY based fertilizer application recorded higher fibre yield of mesta over RDF at Aduthurai. However ST-SY based fertilizer application could not achieve the targeted yield even with addition of FYM. Similar trends were recorded for rice grain also at Bahraich. In acid soil of Nagaon, targeted yield of jute (3.5t/ha) was achieved with application of inorganic fertilizer (150% NPK on ST-TY) along with FYM and lime.

Application of pre-emergence herbicide pretilachlor @ 900 ml/ha along with one hand weeding or use of Nail weeder twice (5 and 10 DAE) followed by one hand weeding (for intra row weeding) reduced weed biomass and increased fibre yield of jute and is recommended for weed control in jute for Nagaon region. Similarly, application of butachlor 5G or 50% EC @ 1.5 kg a.i./ha

along with one hand weeding or use of Nail Weeder twice (5 and 10 DAE) is recommended for weed control in jute for Bahraich region. At Coochbehar, highest fibre yield (27.17 q/ha) of jute was recorded with two hand weeding closely followed by application of pretilachlor @ 900 ml/ha + one hand weeding at 15 DAE. Use of Nail weeder alone or in combination with scrapper followed by one hand weeding is recommended for weed control in *olitorius* jute at Kalyani, West Bengal as it recorded higher fibre yield of jute. Application of quizalofop ethyl @ 60 g/ha at 15 DAE followed by one hand weeding at 15-20 days after herbicide application recorded highest fibre yield of jute with significant reduction in weed biomass and is recommended for weed control in jute in Kendrapara, Odisha and Katihar, Bihar. For successful weed control in mesta, application of quizalofop ethyl @ 60 g/ha at 15 DAE along with one hand weeding at 15-20 days after herbicide application at Aduthurai, Tamil Nadu. Application of pretilachlor 50% EC @ 900 ml/ha at 45-58 hours of irrigation followed by one hand weeding at 15 DAE is recommended for weed control in mesta at Amadalavalasa, Andhra Pradesh respectively. Use of nail weeder twice at 5-6 DAE and 10 DAE or a combination of Nail weeder once at 5-6 DAE, scrapper once at 15 DAE and one hand weeding at 15 DAE is recommended for weed control in sunnhemp at Pratapgarh, Uttar Pradesh.

At Barrackpore, a total 13 weed species were found, in which *Physalis minima* recorded the highest density (148/m^2) and importance value index (IVI-76%). In Murshibad region *Cyperus rotundus* was the dominant weed species (IVI-68.9 %),while , in Goaldah, region *Echinocloa colonum* was the dominant weed species (IVI-59.7%) followed by *Trianthema portulacastrum*. In Kedrapara region, *Echnichloa colonum* was the dominant weed species in farmers' filed of Derabish, Mahanga and Marsaghai blocks (IVI varies 47.8-142%). At Katihar, total 14 weed species were recorded and *Cyperus rotundus* was dominant weed species in farmers field (IVI -72 to 84%) of Barsoi, Khadwa and Pranpur blocks.

At Coochbehar, seed yield of jute was not significantly influenced by sowing date, spacing or topping time though maximum yield was recorded with sowing on 3rd week of August (6.42 q/ha). Sowing of jute on 1st week of July with 45 cm x 10 cm row spacing and topping at 45 DAS gave maximum seed yield of the crop (5.35 q/ha) at Nagaon, Assam and is recommended for the region. Maximum seed yield of *olitorius* jute was recorded with 21st July sowing with spacing of 45 cm x 10 cm or 45 cm x 15 cm (4.58 – 4.82 q/ha) at Katihar, Bihar. Similarly sowing of jute seed crop on 1st fortnight of June with spacing of 45 cm X 10 cm and topping on 30 or 45 days after sowing is recommended for achieving higher seed yield of the crop at Bahraich region of UttarPradesh. At Rahuri, maximum seed yield of jute (28.74 - 29.54 q/ha) was achieved when crop was sown on 10th June with spacing of 60 cm x 15 cm and topping on 30 DAS.

Use of CRIJAF microbial consortium (CRIJAF Sona) has effectively reduced retting duration by 6 to 7 days, increased fibre strength by 3 to 4 g/tex and improved colour and lusture of the fibre at Bahraich, Kalyani and Amadalavalasa centers while at Nagaon, Kendrapara and Katihar centres, the retting duration in jute was reduced by 9-10, 6 and 6 to 8 days, respectively. Similarly, in mesta, the reduction in retting duration by 6 to 8 days using CRIJAF Sona was observed at Aduthurai, Tamil Nadu. CRIJAF Sona was tested in farmers' fields in North 24 Paraganas district of West Bengal, Nagaon district of Assam and Kendrapara district of Odisha under the Tribal Sub Plan programme of AINP and similar reduction in retting duration and improvement in fibre quality in jute was observed in farmers' field condition also.

Maximum green biomass of mesta was recorded at 160 kg N/ha level with kenaf varieties MT 150 at Bamra, Odisha (481.5 q/ha) and with JBM 2004 D at 160 kg N/ha level at Aduthurai, Tamil Nadu (729.3 q/ha).

Sowing of mesta on mid May with 60 cm x 10 cm spacing and topping at 45 DAS recorded significantly higher seed yield (7.66 – 9.44 q/ha) of the crop at Aduthurai, Tamil Nadu and is recommended for the region. The pooled data of 2013 and 2014 revealed that the effect of

spacing and date of topping on seed yield of mesta was non-significant at Kendrapara, Odisha. Sowing of mesta on first or third week of July recorded significantly higher seed yield of the crop at Amadalavalasa, Andhra Pradesh though the effect of spacing and topping time on seed yield was non-significant. The average seed yield was poor due to the effect of *HudHud* cyclone.

Application of NPK recorded significantly higher seed yield of sunnhemp over control at Aduthurai, Tamil Nadu though no significant variation in seed yield of the crop was observed with change in phosphorus and potassium doses among the treatments. The seed yield of sunnhemp was not significantly influenced by spacing at both the locations. Similar trend was observed at Pratapgarh, Uttar Pradesh also though seed yield of sunnhemp was significantly higher with 30 cm x 10 cm spacing.

Application of NPK @ 60:30:60 kg/ha combined with sisal waste @ 20 t/ha recorded 17.1 q/ha fibre yield of sisal which was at par with yield recorded with NPK treatment of 90:30:60 kg/ha + sisal waste @ 20 t/ha (20.2 q/ha) but significantly higher over other fertilizer treatments at Bamra, Odisha.

Maximum fibre yield of flax was recorded with 30th October sowing (19.46 q/ha) and 15 cm row spacing (15.23 q/ha) at Pratapgarh, Uttar Pradesh while maximum biomass of the crop was recorded with 5th January sowing and 15 cm row spacing at Wellington, Tamil Nadu.

Crop Protection

During 2014-15, eleven projects comprising of 38 trials were conducted in jute and allied fibre crops at different AINP centers under crop protection programme.

Survey and surveillance of insect pests and diseases of jute were carried out in different AINP centres. In jute, yellow mite, semilooper, Bihar hairy caterpillar and stem weevil were the most common insect pests. Infestation of indigo caterpillar (8.68%) and grey weevil (67.69%) was specific to Nagaon and Barrackpore respectively. The yellow mite infestation was more consistent across the centres with maximum infestation of 8.62, 10.38, 25.62, 64.45, 89.33 and 129.39 mite population/cm^2 leaf area on 2nd unfolded leaf at Nagaon, Kendrapara, Coochbehar, Bahraich, Katihar and Barrackpore respectively coinciding at 45 DAS to 75 DAS during last week of May to mid-June. Maximum infestation of Bihar hairy caterpillar was noticed at Barrackpore (80.66%) followed by Katihar (12.67%) occurred at 75 and 85 DAS respectively during June-July.

Jute semilooper infestation was observed at Katihar, Coochbehar, Nagaon, Kendrapara and Barrackpore. The period of semilooper infestation was from second fortningtof May to last week of August with maximum of 100.00, 16.36, 13.26, 41.00 and 20.68% plant damage respectively from 65 DAS to 120 DAS. Stem weevil infestation was noticed in all the centres except Coochbehar and Bahraich. At Nagaon, Kendrapara, Katihar and Barrackpore maximum stem weevil infestation was found from second fortnight of May to mid-July with 4.61%, 10.66%, 14.3% and 53.33% plant damage at 45 DAS to 85 DAS. The infestation of mealybug observed only at Barrackpore from first week of July with 6.33% plant damage during 95 DAS. In general yellow mite, indigo caterpillar and stem weevil were more prevalent during the early crop growth period whereas Bihar hairy caterpillar, semilooper and mealybug were active during the later part of the crop period. Stem rot, root rot, anthracnose and mosaic diseases were common in jute. The infestation of leaf mosaic of white jute was very specific to Bahraich, Kendrapara and Katihar centres with 60.70%, 21.66% and 9.06% incidence respectively during 90 DAS to 120 DAS. Seedling blight incidence at Nagaonwas 2.68%. Maximum incidence of anthracnose was observed after 95 DAS in August to the extent of 3.34% and 22.68% at Katihar and Nagaon respectively. The maximum incidence of stem rot was observed during July to August with 1.00%, 6.18%, 7.60%, 7.96%, 9.65% and 9.82% at Nagaon, Coochbehar, Bahraich, Barrackpore, Kendrapara and Katihar respectively.The severity of root rot was maximum at Nagaon, Kendrapara, Katihar, Bahraich,

Coochbehar and Barrackpore with incidence of 18.86%, 10.41%, 8.42%, 4.35%, 2.69% and 2.46% respectively.

Among the *tossa* jute (*C. olitorius*) germplasms, the accessions, OIN-01, OIN-52, OIN-72, OIN-111, OIN-77 and OIN-32 were least susceptible (<5.00 mites/ cm^2 leaf) to yellow mite at Kendrapara and Coochbehar while two lines namely, OIN-112 and OIN-17 were less susceptible (< 2.00%) to stem weevil infestation. In Nagaon the white jute germplasm, CIN-59, CIN-58 and CIN-107 were least (< 10.00 mites/ cm^2 leaf) infested with yellow mite while, CIN-99 was immune to stem weevil. The white jute accessions, CIN-06, CIN-15, CIN-11, and CIN-59 were less susceptible to stem rot while CIN-15 and CIN-65 were least susceptible to root rot at Bahraich. Among the mesta germplasm 29 lines were highly susceptible and another 12 lines were moderately susceptible against foot and stem rot disease.

On the basis of disease incidence in the elite germplasms, OIN-853 line was found to be least susceptible to stem rot i.e. 1.08, 2.25, 3.16, 4.36 at 45, 65, 75 and 90 DAS respectively at Coochbehar. The same line i.e., OIN-853 was found to be less susceptible (2.73) at Barrackpore.

The effect of sowing time and insecticides on insect pests of jute indicated that at Barrackpore the late crop sown on 15th April harbored significantly more mite than the early (15th March) sown crop. Similar trend was observed in Coochbehar, Katihar, Kendrapara and Nagaon. At Barrackpore, the fibre yield of earlier sown (15th March) crop with foliar spray of fenazaquin 10 EC @ 0.015% at 45 and 60 DAS resulted in significantly higher fibre yield (30.34q/ ha). At Nagaon the treatment effect on mite was non- significant. The foliar spray of lamdacyahalothrin 5EC @ 0.0030% at 70 and 80 DAS was most effective on semilooper and Bihar hairy caterpillar with significantly less plant damage. The fibre yield of early sown crop (15th March) was more (36.18 q/ ha) than the late sown crop (31.76 q/ ha). Similar trend was also observed at Kendrapara and Katihar. At Coochbehar significantly less mite infestation and more fibre yield of jute was recorded in fenazaquin 10 EC (0.015%) treatment. At Kendrapara also the crop protected with fenazaquin and profenophos reduced mite and semilooper infestation significantly with maximum yield (26.81 q/ ha). At Katihar the best treatment against sucking and lepidopteran pests was found with abamectin 1.8 EC (0.015%) followed by lamdacyhalothrin 5 EC (0.003%).

For management of stem rot under integrated crop management system, the incidence of stem rot was higher (331.99 codex) in 15thMarch sown crop, which was lower (206.06) in 30th March sown crop at Kendrapara. Seed treatment with *T. viride* @10g/kg + butachlor @ 2kg a.i. /ha as pre-emergence application + spraying of carbendazim 50 WP @ 0.1% + spraying of endosulfan 35 EC @ 0.15% at 15 days interval significantly reduced root rot incidence at Kendrapara with maximum fibre yield (29.45 q/ ha).

In ecofriendly management of insect pests and diseases of jute, the integrated organic module consisting of FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% at 45 DAS + neem oil @ 0.03% was most effective against jute stem rot at Coochbehar and Nagaon. Whereas in Barrackpore and Katihar the module v*iz.,* 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% at 45 DAS + neem oil @0.03% was found be effective against stem rot. In Nagaon and Kendrapara the least incidence of root rot was found with organic module *i.e* FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% at 45 DAS + neem oil at 0.03%, whereas in Coochbehar and Katihar the module consisting of 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/ kg seed and soil application @ 2 kg/ha at 21 DAS + *P. fluorescens* spray at 0.2% at 45 DAS + neem oil at 0.03% was effective reducing the incidence of root rot disease.

Among the new fungicides tested at Amadalavalasa against foot rot disease of mesta caused by *Phytopthoraparasitica var. sabdariffae,* seed treatment with cymoxanil 8% WP @ 3g/kg and 0.3% foliar spray at 120 DAS was found most effective being at par with metalaxyl MZ 8% WP (seed treatment @ 2g/kg and 0.2% foliar spray) while, maximum fibre yield (34.36 q/ ha) was recorded in the later.

Foliar application of spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS was most effective for management of yellow mite in jute with maximum fibre yield at Barrackpore, Coochbehar, Katihar, Nagaon and Kendrapara centres.

The bioefficacy of mineral oil against yellow mite, *Polyphagotarsonemus latus* Banks in jute revealed that the treatment of mineral oil @ 3 ml/litre + neem oil @ 3 ml/litre at 35 and 50 DAS was most effective at Barrackpore with highest fibre yield of 24.93 q/ ha. whereas, at Kendrapara the treatment consisting of mineral oil @ 9 ml/litre at 35 and 50 DAS was found to be effective against yellow mite with highest fibre yield (28.41 q/ ha).

Among the new fungicide molecules for management of *Macrophomina phaseolina* induced disease complex in jute, seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age was found to reduce the stem rot at Kendrapara, Barrackpore, Coochbehar, Nagaon and Katihar with miximum fibre yield of 24.64, 29.28, 20.85 and 29.13 q/ ha respectively. Similar trend was observed with same treatment on reducing the root rot incidence in all the centres except Katihar.

There was no significant difference in insect pests and disease incidence among the test entries and check varieties in the AVT-I and AVT-II trials of *tossa* jute at Barrackpore.

Whereas in case of white jute in AVT-I, all the lines were susceptible to BHC, semilooper, yellow mite, stem weevil, stem rot and yellow vein mosaic virus. No significant effect was observed among the entries.

Among the four advance lines of *H. sabdariffa* tested (AVT-I) with check at Barrackpore for resistance against foot and stem rot disease, JRR-2012-1 was least infected at 75 DAS. In AVT-II, AHS-230 recorded least incidence (0.75%) at 75 DAS against foot and stem rot whereas the entry, JRR-2011-1 was found be susceptible with incidence of 3.60% at 60 DAS.

The sunnhemp lines varied non-significantly in AVT-II in terms of their resistance status to diseases.

At Amadalavalasa, in AVT-I for screening of roselle entries, AHS-254 was found to be least susceptible to aphid, leafhopper, whitefly, mealybug and semilooper. Whereas, the test entry AHS-249 was found to be resistant against foot and stem rot disease. In AVT-II for screening of roselle entry, AHS-233 was resistant to all the major insect pests.

Fibre Quality

Fibre quality 2013-14

Tossa jute

IET: Three entries namely BCCO-9, BCCO-8 and JROCS-1, showed promising fibre quality compared to check varieties only at Katihar centre.

AVT-I: Two entries namely BCCO-6 and JRO-2011-2 were superior to best check at Katihar, while JROK-10, KRO-5 are of superior quality compared to best check JRO 8432.

White jute

IET: No single entry was found to be uniformly better than check varieties. However, two entries

namely NCJ-28-1-1, NDJC-2013 are at par with best check JRC 698 in terms of overall fibre quality at Bahraich centre.

AVT-I: No entry shown uniform fibre quality in 3 locations. However, NCJ 28-14 showed good fibre quality at Bahraich while JRCJ-3 showed fairly good at Kendrapara centre.

AVT-II: Tenacity values of all the entries were weak in nature at all three centres. Only NDJC-2011 showed fairly good to fairly average fibre quality.

Roselle

IET: Only AHS-254 showed comparable fibre quality with best check HS 4288 at Rahuri centre.

AVT-I: One entry AHS-230 showed good overall fibre quality compared to best check HS 4288 in all locations except Rahuri center.

AVT-II: Entry AHS-216 showed uniformly better overall fibre quality compared to check HS 4288 and AMV5.

Kenaf

IET: Tenacity values were uniformly better in nature at all centres. Except Aduthurai, in all centres entries showed good fibre quality parameters. JRK-2011-1 and JRK-2011-2 showed consistently better fibre quality compared to check varieties.

AVT-II: Fibre quality parameters of all entries were good in all centres except Aduthurai centre. Fibre quality grade were M-2 to M-3 for all entries. No single entry showed better fibre quality than check varieties.

Sunnhemp

Sanai -7 in IET and SUIN-77 in AVT-II showed better tenacity value at Aduthurai only. No entry was found better than check variety K12 yellow in AVT –I. All entries across trials showed weak tenacity values at Pratapgarh location.

Flax

IET: JRF-6 and JRF-7 showed better tenacity than JRF-2 at Pratapgarh centre.

Fibre quality 2014-15

Tossa jute

IET: Root content varied from 8 to 25 percent at Kalyani and 10 - 25 percent at Coochbehar with full of defects. Tenacity values of all the samples in general varied from fair average to fairly good.

AVT-I: Root content varied from 20 to 35 percent at Kalyani, 15 to 20 percent at Coochbehar 8 to 15 percent Barrackpore with full of defects. Tenacity values of all the samples was from fair average to fairly good.

AVT-II: At all centres fibre samples were full of defects and more or less fair average tenacity values Fibre Fineness showed very fine to fine and grade TD-4 to TD -5.

White jute

IET: All the samples showed average 25 % hard root content except Kalyani (30 to 40 %). Fibre tenacity was weak in nature and very fine at all centres.

AVT-I: Overall fibre quality of all entries was of W-5 to W-6 grade except Coochbehar where quality is poor for all entries

AVT-II: In general fibres of all entries are full of defects and having weak tenacity values. Grade varied from W5 to W6

Roselle

In IET all entries showed maximum defects at Barrackpore and fibre were very fine and weak under grade B-2 to B-3. While in AVT-I and AVT-II all entries showed maximum defects with very fine and weak to average tenacity under grade B-3 and up.

Kenaf

In IET and AVT I all entries showed maximum defects at Barrackpore with average to fairly good tenacity and fine to very fine fibre under M-4 and up grades

Sunnhemp

In IET, AVT-I and AVT-II all entries showed very weak to fairly good fibre tenacity.

Tribal Sub Plan

The Tribal Sub Plan programme had been conducted in 6 villages of West Bengal, Odisha and Assam covering 86 ha area and 338 tribal farmers participated in the programme. The improved production technologies of both fibre and seed crop of jute as well as the improved microbial retting technology developed by ICAR-CRIJAF had been demonstrated to the farmers. In Coochbehar and Alipurduar districts, the farmers had been demonstrated the improved production technologies of both fibre and seed jute crop. Line sowing in jute with CRIJAF Multi Row Seed Drill recorded 12% increase in fibre yield over broadcasting (22.86 q/ha) at Srikrishnapur and Matiagacha villages in 24 Paraganas North district of West Bengal and the farmers of these villages had got more price of jute fibre (₹ 500/q) using 'CRIJAF Sona' and the retting duration was also reduced by 6-7 days. In Keonjhar district of Odisha, the fibre yield and net return of jute in demonstration fields on improved production and crop protection technologies, on an average, was higher by 8-11% and by ₹ 17000 -18000/ha, respectively, over farmers' practice. At Nagaon and Morigaon districts of Assam, the fibre yield of jute variety Tarun under improved package of practice recorded 20-25% higher fibre yield over farmers' practice. Use of CRIJAF Sona recorded improvement in fibre strength by 1.6-3.5 g/tex and also fetched higher price (₹ 375 – 500/q) over farmers' practice in Assam.

कार्यकारी सारांश

फसल सुधार

पटसन एवं समवर्गीय रेशा फसलों में फसल सुधार कार्यक्रम के अन्तर्गत विभिन्न केन्द्रों पर 26 परियोजनाओं से संबंधित कुल 118 परीक्षण किये गये। इनमें जननद्रव्यों के मूल्यांकन, संकरण, बहुस्थानीक उपज परीक्षण (आई.ई.टी.), ए.वी.टी.–I , आई.ई.टी., ए.वी.टी.–II , तथा अनुकूली परीक्षण से संबंधित पटसन की कुल बारह, मेस्ता की आठ, सनई की तीन फ्लैक्स की दो तथा रेमी की एक परियोजनायें शामिल थी।

अखिल भारतीय नेटवर्क परियोजना की 11वीं वार्षिक बैठक में चिन्हित तोषा पटसन की जे.आर.ओ.जी.–1, केनॉफ की जे.बी.एम.जी.–4, रोज़ेल के क्रिजैफ–2 एवं क्रिजैफ–8, सनई की जे.आर.जे.–610, तथा फ्लैक्स की जे.आर.एफ.–2 प्रजातियों का विमोचन प्रस्ताव केन्द्रीय प्रजाति विमोचन समिति के विचारार्थ प्रेषित किया गया है।

पटसन जननद्रव्यों का मूल्यांकन

सादा पटसन की कुल 75 जननद्रव्यों का परीक्षण उनकी रेशा उपज क्षमता तथा इससे संबंधित गुणों के लिए छह केन्द्रों पर किया गया। पाँच केन्द्रों इन जननद्रव्यों का औसत रेशा उपज 9.8 ± 1.6 ग्रा./पौध (सी.आई.एन.–364) तक दर्ज किया गया। तीन जननद्रव्यों नामतः सी.आई.एन.–364, सी.आई.एन.–367 तथा सी.आई.एन.–138 की रेशा उपज क्षमता चेक प्रजाति जे.आर.सी.–517 से बेहतर दर्ज की गयी।

तोषा पटसन में भी कुल 75 जननद्रव्यों का मूल्यांकन रेशा उपज तथा सम्बद्ध गुणों के लिए कुल छह केन्द्रों पर किया गया। इन जननद्रव्यों की रेशा उपज 8.5 ग्रा./पौध से लेकर 12.4 ग्रा./पौध तक तथा औसत रेशा उपज 10.0 ± 0.9 ग्रा./पौध दर्ज की गयी। बारह जननद्रव्यों की रेशा उपज क्षमता सर्वोत्तम चेक प्रजाति जे.आर.ओ.–204 से बेहतर पायी गयी।

मेस्ता जननद्रव्यों का मूल्यांकन

रोजेल के कुल 158 जननद्रव्यों की रेशा उपज क्षमता का मूल्यांकन दो केन्द्रों पर किया गया। सात जननद्रव्यों की रेशा उपज चेक प्रजाति ए.एम.वी.–5 की तुलना में बेहतर पायी गयी। आडुथूरई केन्द्र पर केनॉफ के कुल 75 जननद्रव्यों के मूल्यांकन में केवल एक जननद्रव्य के.आई.जे.–164 को चेक प्रजाति ए.एम.सी.–108 की तुलना में बेहतर पाया गया।

राष्ट्रीय संकरण कार्यक्रम

सादा पटसन के एफ$_4$ संततियों का पाँच केन्द्रों पर मूल्यांकन किया गया। संकर संयोग सी.आई.एन.–149 x जे.आर.सी.–321 से उद्भवित संततियों ने कल्याणी केन्द्र पर सर्वाधिक रेशा उपज दिया। हरित जैवभार एवं रेशा उपज के दृष्टिकोण से सी.आई.जे.–100 x जे.आर.सी.–212 से प्राप्त संततियों ने चेक प्रजाति जे.आर.सी.–698 की तुलना में बेहतर प्रदर्शन किया।

तोषा पटसन के 36 एफ$_3$ संततियों के पाँच केन्द्रों पर मूल्यांकन के दौरान औसत रेशा उपज 9.2 ± 0.9 ग्रा./पौध दर्ज किया गया। संकर संयोग ओ.आई.जे.–015 x ओ.आई.एन.–028 से प्राप्त संतुतियों ने चेक प्रजाति जे.आर.ओ.–204 की तुलना में उत्कृष्ट प्रदर्शन करते हुए सर्वाधिक औसत रेशा उपज दिया। कटिहार केन्द्र पर तोषा पटसन के 43 संकरों का एफ2 संतति प्राप्त हुआ तथा सादा पटसन के 22 नवीन एफ1 संकर विकसित किये गये।

आमाडालावालासा केन्द्र पर रोज़ेल के 150 एफ$_4$ संततियों के मूल्यांकन के दौरान कुल 194 एकल पादप संततियों का चयन कर उनके प्रगामी संततियों के बीज प्राप्त किये गये।

उपज मूल्यांकन परीक्षण

तोषा पटसन (सी. ऑलीटोरियस)

आई.ई.टी.: चेक प्रजाति जे.आर.ओ.–524 को 36.15 कु./है. रेशा उपज के साथ सर्वश्रेष्ठ पाया गया जबकि जाँच प्रविष्टि एन.जे.–7050 34.01

कु./है. रेशा उपज के साथ दूसरा तथा जाँच प्रविष्टि जे.आर.ओ.–8432 (33.74 कु./है.) तीसरा स्थान पर थे।

ए.वी.टी.– I: चेक प्रजाति जे.आर.ओ.–8432 (31.36 कु./है.) ने सर्वाधिक रेशा उपज दर्ज कराया जिसके बाद जाँच प्रविष्टि एन.जे.–7005 (28.87 कु./है.) का स्थान रहा।

ए.वी.टी.– II: स्थानों तथा वर्षों के संयुक्त विश्लेषण के आधार पर जाँच प्रविष्टि के.आर.ओ.–4 को 27.73 कु./है. रेशा उपज के साथ सर्वश्रेष्ठ पाया गया जिसके बाद चेक प्रजाति जे.आर.ओ.–8432 (27.09 कु./है.) का स्थान रहा।

सादा पटसन (सी. कैपसूलरिस)

आई.ई.टी.: कूल 8 प्रविष्टियों के सात स्थानों पर मूल्यांकन के दौरान जाँच प्रविष्टि बी.सी.सी.सी.–4 ने 32.76 कु./है. रेशा उपज के साथ सर्वश्रेष्ठ प्रदर्शन किया।

ए.वी.टी.– I: चार जाँच तथा दो चेक प्रजातियों के सात स्थानों पर मूल्यांकन के फलस्वरूप जाँच प्रविष्टि वी.सी.सी.सी.–3 को 25.35 कु./है. रेशा उपज के साथ सर्वश्रेष्ठ पाया गया जिसके बाद एन.सी.जे.–28–1–1 (25.23 कु./है.) का स्थान रहा।

ए.वी.टी.– II: वर्षों तथा स्थानों के संयुक्त विश्लेषण के आधार पर जाँच प्रविष्टि बी.सी.सी.–2 (25.57 कु./है.) सर्वाधिक श्रेष्ठ पाया गया जिसके बाद क्रमशः एन.सी.जे.–28–14 (25.15 कु./है.) तथा जे.आर.सी.जे.–3 (24.79 कु./है.) ने बेहतर प्रदर्शन किया।

रोजेल (एच. सब्दरीफा)

आई.ई.टी.: छह जाँच प्रविष्टियों का मूल्यांकन दो चेक प्रजातियों के साथ कुल सात स्थानों पर किया गया। जिनमें जाँच प्रविष्टि जे.आर.एच. एस.–2 (27.79) तथा जे.आर.एय.एस.–1 (27.29 कु./है.) ने चेक प्रजाति ए.एम.वी.–5 (25.79 कु./है.) की तुलना में सार्थकतापूर्वक उच्च रेशा उपज दर्ज कराये।

ए.वी.टी.– I: जाँच प्रविष्टि ए.एच.एस.–249 ने 24.77 कु./है. रेशा उपज के साथ सर्वश्रेष्ठ प्रदर्शन किया जिसके बाद जाँच प्रविष्टि जे.आर. आर.–2012–1 (23.46) का स्थान रहा।

ए.वी.टी.–II: औसत निष्पादन के आधार पर जाँच प्रविष्टि ए.एच.एस.–230 (27.87 कु./है.) को सर्वोत्तम पाया गया जिसके बाद जाँच प्रविष्टि ए.एम.एस.–233 (25.94 कु./है.) ने उत्कृष्ट प्रदर्शन किया।

केनॉफ (एच. केनाबिनस)

आई.ई.टी.: चेक प्रजाति ए.एम.सी.–108 ने 33.98 कु./है. रेशा उपज के साथ उत्कृष्ट प्रदर्शन किया जिसके बाद जाँच प्रविष्टि जे.आर. के.–2013–1 (33.90 कु/है.) ने बेहतर रेशा उपज दर्ज कराया।

ए.वी.टी.–I: जाँच प्रविष्टि जे.आर.के.–2011–2 (26.43 कु./है.) चेक प्रजाति ए.एम.सी.–108 (25.83 कु./है.) की तुलना में बेहतर रेशा उपज दर्ज कराया जिसके बाद क्रमशः जाँच प्रविष्टि जे.आर.के.–2011–1 (25.80 कु./है.) तथा जे.आर.के. 2011–4 (24.15 कु./है.) बेहतर पाये गये।

सनई (सी. जंसिया)

आई.ई.टी.: पाँच केन्द्रों पर कुल छह जाँच प्रविष्टियों के परीक्षण में जाँच प्रविष्टि सनई–11 (11.87 कु./है.), सनई–12 (11.47 कु./है.) तथा जे.आर.एस.–2013–1 (11.43 कु./है.) की रेशा उपज क्षमता दोनों चेक प्रजातियों की तुलना में बेहतर पायी गयी।

ए.वी.टी.– I: पाँच प्रविष्टियों का मूल्यांकन दो चेक प्रजातियों के साथ कुल पाँच स्थानों पर किया गया जिनमें किसी भी प्रविष्टि की रेशा उपज सर्वोतम चेक प्रजाति एस.एच.–4 (8.42 कु./है.) से बेहतर नहीं पाया गया।

ए.वी.टी.– II: औसत रेशा उपज के आधार पर जाँच प्रविष्टियां एस.यू.आई.एन.–5 (9.30 कु./है.) एस.यू.आई.एन.–3 (9.09 कु./है.), एस.यू.आई. एन.–4 (8.42 कु./है.) की तुलना में बेहतर पायी गयीं।

रेमी (बी. निविया)

ए.वी.टी.– I: जाँच प्रविष्टि आर.–1514 की रेशा उपज क्षमता सरभोग केन्द्र पर अधिकतम 15.59 कु./है./वर्ष दर्ज की गयी जबकि अधिकतम हरित जैवभार (634 कु./है./वर्ष) की दृष्टिकोण से जाँच प्रविष्टि आर.–1518 को बेहतर पाया गया किन्तु इसमें शुष्क रेशे की मात्रा न्यूनतम (1.9 प्रतिशत) थी।

फ्लैक्स (एल. यूसीटाटीसिमम)

आई.ई.टी.: प्रतापगढ़ केन्द्र पर जाँच प्रविष्टि जे.आर.एफ.–13 (17.9 कु./है.) तथा जे.आर.एम.–10 (15.7 कु./है.) का प्रदर्शन बेहतर पाया गया।

ए.वी.टी.– I: जाँच प्रविष्टि जे.आर.एफ.–9 (97.76 से.मी.) की पौध उँचाई सर्वाधिक दर्ज की गयी जिसके बाद क्रमशः जे.आर.एफ.–8 (94.33 से.मी.) तथा जे.आर.एम.–6 (92.19 से.मी.) का स्थान था।

अनुकूली परीक्षण

सादा पटसनः पश्चिम बंगाल में चार तथा ओडिशा, बिहार, असम एवं उत्तर प्रदेश में एक–एक स्थानों पर परीक्षण के दौरान जाँच प्रविष्टि एन.डी.जे.सी.–2011 ने 26.12 कु./है. रेशा उपज दर्ज कराया जो चेक प्रजाति जे.आर.सी.–517 (25.78 कु./है.) की तुलना में मात्र 1.30 प्रतिशत अधिक थी।

केनॉफः जे.बी.एम.पी.–1 ने ओडिशा तथा पश्चिम बंगाल में अनुकूली परीक्षण के दौरान 27.80 कु./है. रेशा दर्ज कराया जो चेक प्रजाति ए.एम.सी.–108 की तुलना में 6.94 प्रतिशत अधिक थी।

रोजेलः जाँच प्रविष्टि ए.एच.एस.–216 (21.54 कु./है.) ने चेक प्रजाति ए.एम.वी.–5 (19.54 कु./है.) की अपेक्षा महाराष्ट्र में परीक्षण के दौरान 10.24 प्रतिशत अधिक रेशा उपज दर्शाया।

सनईः उत्तर प्रदेश में चार स्थानों पर किये गये परीक्षण के आधार पर जाँच प्रविष्टि एस.यू.आई.एन. की औसत रेशा उपज 14.07 कु./है. दर्ज की गयी जो सर्वश्रेष्ठ चेक प्रजाति एस.यू.आई.एन.–053 की उपज से 45.70 प्रतिशत अधिक थी।

फ्लैक्सः जाँच प्रविष्टि जे.आर.एफ.–4 की औसत रेशा उपज 18.20 कु./है. दर्ज की गयी जो कि जे.आर.एफ.–2 (16.59 कु./है.) की उपज क्षमता से 9.67 प्रतिशत अधिक थी।

फसल उत्पादन

वर्ष 2014–15 में ए.आई.एन.पी. के विभिन्न केन्द्रों पर फसल उत्पादन कार्यक्रम के अर्न्तगत पटसन एवं समवर्गीय रेशा फसलों के कुल 15 अनुसंधान परियोजनाओं के अन्तर्गत कुल 53 परीक्षण आयोजित किये गये। बहराइच, उत्तर प्रदेश में अनुकूलन परीक्षण के दौरान *सी. कैपसूलरिस* की नई जीनोटाइप एन.डी.जे.सी.–2011 द्वारा चेक प्रजातियों की तुलना में रेशा उपजों में वृद्धि पायी गयी। बैरकपुर, पश्चिम बंगाल में नत्रजनःफास्फोरसःपोटाश 80:17.5:33 कि.ग्रा./है. जबकि कल्याणी, पश्चिम बंगाल तथा बहराईच, उत्तर प्रदेश में 100:21.8:41.7 कि.ग्रा./है. के प्रयोग *से कैपसूलरिस* प्रजाति के रेशा उपज में सार्थक वृद्धि हुई। आंध्र प्रदेश के आमाडालावालासा में केनॉफ की प्रविष्टि जे.वी.एम.पी.–1 में चेक प्रजाति (एच.सी. 583) की अपेक्षा अधिक पौध ऊँचाई के साथ रेशा उपज (9.31 कु./है.) दर्ज की गयी।

आमाडालावालसा एवं केन्द्रपाड़ा में नत्रजनः फॉस्फोरसः पोटाश 60:23.2:25 कि.ग्रा./है. तथा बामरा (ओडिशा) में 80:17.5:33.3 कि.ग्रा./है. के प्रयोग से केनॉफ प्रजातियों की रेशा उपज में सार्थक वृद्धि दर्ज की गयी। अडुथूरई एवं आमाडालावालासा केन्द्रों पर अनुकूलन परीक्षण के दौरान रोज़ेल की किसी भी नई प्रविष्टि (जे.वी.आर.पी.–01, ए.एच.स.–216) द्वारा चेक प्रजाति ए.एम.वी. 5 की तुलना में रेशा उपज में सार्थक वृद्धि नहीं पाई गई। आमाडालावालसा केन्द्र पर नत्रजनःफास्फोरसःपोटाश 60:13.2:25 कि.ग्रा./है. के प्रयोग से रोज़ेल जीनोटाइप के रेशा उपज में बढ़ोतरी हुई। प्रतापगढ़ में सनई की नई प्रविष्टि एस.यू.आई.एन.–62 में चेक प्रजाति एस.एच. 4 की अपेक्षा अधिक रेशा उपज की प्राप्ति हुई। इस सार्थक वृद्धि में नत्रजनःफास्फोरसःपोटाश 20:40:40 कि.ग्रा./है. का योगदान था।

कटिहार एवं बहराइच में मृदा परीक्षण एवं लक्ष्य निर्धारित उर्वरक के प्रयोग से संस्तुत उर्वरक की अपेक्षा अधिक पटसन रेशा उपज की प्राप्ति हुई । इसी तरह, अडुथूरई में मृदा परीक्षण एवं लक्ष्य निर्धारित उर्वरक प्रयोग से संस्तुत उर्वरकों की अपेक्षा ज्यादा मेस्ता रेशा उपज की प्राप्ति हुई । यद्यपि, मृदा परीक्षण एवं लक्ष्य निर्धारित उर्वरकों के अतिरिक्त एफ. वाई. एम. के साथ प्रयोग करने से भी लक्षित उपज की प्राप्ति नहीं हो सकी । बहराइच केन्द्र पर धान के उपज में यही चलन (ट्रेण्ड) देखा गया । नौगाँव के अम्लीय मृदा में पटसन की लक्षित उपज (3.5टन/है.) की प्राप्ति केवल अजैविक उर्वरकों (150 % एन. पी. के मृदा परीक्षण उपज लक्षित) को अकेले या एफ. वाई. एम. के साथ सम्मिलित प्रयोग से हुई।

अंकुरण–पूर्व शाकनाशी प्रेटिलाक्लोर 900 मि.ली./है. के साथ हाथ से एक निराई या दो बार नेल वीडर चलाने (अंकुरण के 5 एवं 10 दिन बाद) तथा हाथ से एक निराई (पंक्तियों में) करने से खरपतपवार की संख्या में कमी के साथ पटसन रेशा उपज में सार्थक वृद्धि होती है। यह नौगाँव क्षेत्र के लिये संस्तुत किया गया है। इसी तरह बहराइच क्षेत्र में भी पटसन के खरपतवार प्रबन्धन हेतु ब्यूटाक्लोर 5 जी. या ब्यूटाक्लोर 50% ई. सी. 1.5 कि. ग्रा. ए. आई./है. के साथ हाथ की एक निराई या दो बार नेल वीडर का प्रयोग (अंकुरण के 5 एवं 10 दिन बाद) संस्तुत किया गया है । कूचबिहार में अधिकतम रेशा उपज (27.17 कु./है.) की प्राप्ति हाथ द्वारा दो निराई अथवा प्रेटिलाक्लोर 900 मि. ली./है. तथा हाथ की एक निराई (अंकुरण के 15 दिन बाद) से हुई । कल्याणी (पश्चिम बंगाल) में ओलीटोरियस पटसन की सर्वाधिक उपज नेल वीडर को अकेले या स्क्रैपर के साथ हाथ की एक निराई से हुई । यह विधि इस क्षेत्र के लिए अनुशंसित की गई है । केन्द्रपाड़ा (ओडिशा) तथा कटिहार (बिहार) में सबसे अधिक रेशा उपज क्विजेलोफॉप ईथाइल 60 ग्रा./है. को अंकुरण के 15 दिन पश्चात् तथा हाथ की एक निराई (शाकनाशी छिड़काव के 15–20 दिन बाद) से हुई तथा इसे इन क्षेत्रों के लिये अनुशंसित की गई है ।

मेस्ता में खरपतवार के सफल प्रबन्धन हेतु आडुथूरई (तमिलनाडु) में अंकुरण के 15 दिन बाद क्विजैलोफॉप ईथाइल 60 ग्रा./है. के छिड़काव के साथ ही इसके 15–20 दिनों बाद हाथ की एक निराई तथा आमाडालावालसा (आंध्र प्रदेश) में सिंचाई के 45–48 घंटे बाद प्रेटिलाक्लोर 50% ई.सी. 900 मि.ली./है. के प्रयोग के साथ ही छिड़काव के 15–20 दिनों बाद हाथ की एक निराई अनुशंसित की गई है ।

उत्तर प्रदेश के प्रतापगढ़ में सनई में खरपतवार प्रबन्धन हेतु अंकुरण पश्चात् नेलवीडर को दो बार क्रमशः 5–6 तथा 10 दिनों के बाद या संयुक्त रूप से (मिला–जुला कर) अंकुरण के 5–6 दिनों बाद नेल वीडर को एक बार तथा अंकुरण के 15 दिन बाद एक बार स्क्रैपर चलाने अथवा हाथ की एक निराई अनुशंसित की गयी है।

बैरकपुर में खरपतार की 13 प्रजातियों पायी गयी जिसमें से फाइसैलिस मिनिमा में सबसे ज्यादा घनत्व (148/वर्ग मी.) तथा महता सूचकांक (आई.वी.आई.) 76 प्रतिशत देखा गया। मुर्शिदाबाद इलाके में साइपेरस रोटंडस का प्रभाव सबसे ज्यादा (आई.वी.आई.–68.9 प्रतिशत) था जबकि ग्वालदह क्षेत्र में इकाईनोक्लोआ कोलोनम सबसे ज्यादा प्रभावी खरपतवार (आई.वी.आई.–59.7 प्रतिशत) था जिसके बाद ट्राइएन्थेमा पोर्टूलाकैस्ट्रम का स्थान था। केन्द्रपाड़ा के डेराबिश, महंग और मार्शाघाई प्रखंड के किसानों के खेतों में इकाईनोक्लोआ कोलोनम का प्रभाव सबसे ज्यादा पाया गया। कटिहार में कुल 14 खरपतवार प्रजातियाँ पायी गयी जिसमें साइपेरस रोटंडस सबसे प्रभावी ढंग से (आई.वी. आई.–72–84 पतिशत) बारसोई, खदवा और प्राणपुर प्रखंड के किसानों के खेतों में मौजूद था। कूचबिहार में अधिकतम पटसन बीज उपज (6.42 कु./है.) अगस्त के तृतीय सप्ताह में बुआई पर देखा गया; यह बुआई समय, दो कतारों की दूरी (स्पेसिंग) तथा टॉपिंग के समय से प्रभावित नहीं था। नौगांव (असम) में, जब बुआई का समय जुलाई के प्रथम सप्ताह, कतारों की दूरी 45 सें.मी. x 10 सें.मी तथा टॉपिंग बुआई के 45 दिनों बाद की गयी तो, बीज उपज सर्वाधिक (5.35 कु./है.) रहा और यही इस क्षेत्र के लिए अनुशंसित है। जबकि, कटिहार (बिहार) में सर्वाधिक बीज उपज (4.13–4.8 कु./है.) 21 जुलाई के बुआई से हुआ जिसमें कतारों की दूरी 45 सें.मी. x 10 सें. मी. अथवा 45 सें.मी. x 15 सें.मी. रखा गया था। इसी तरह से बहराईच (उत्तर प्रदेश) में सर्वाधिक बीज उपज के लिए बुआई का समय जून के प्रथम भाग, कतारों की दूरी 45 सें.मी. x 10 सें.मी. तथा टॉपिंग का समय 30 अथवा 45 दिन बुआई पश्चात् अनुशंसित किया गया है। राहुरी (महाराष्ट्र) में सर्वाधिक पटसन बीज उपज (28.74–29.54 कु./है.) फसल को 10 जून तक बुआई करने पर, कतारों की दूरी 60 सें.मी. x 15 सें.मी. रखने पर तथा 30 दिनों बुआई पश्चात् टॉपिंग करने पर प्राप्त हुआ।

क्रिजैफ द्वारा विकसित पाउडर आधारित सूक्ष्मजीवी सम्मिश्रण (क्रिजैफ सोना) के प्रयोग से बहराईच, कल्याणी तथा अमाडलावालासा में सड़न अवधि 6–7 दिनों तक कम हो गई, तंतु शक्ति 3 से 4 ग्रा./टेक्स बढ़ा साथ–ही तंतु के रंग और चमक में भी उन्नति हुई। जबकि, नौगांव,

केन्द्रपाड़ा और कटिहार में सड़न अवधि क्रमशः 9 से 10 दिन, 6 दिन से 8 दिनों तक कम हुई। इसी प्रकार, 'क्रिजैफ सोना' के व्यवहार से आडुथूरई (तमिलनाडु) केन्द्र पर, मेस्ता की सड़न अवधि 6 से 8 दिनों तक कम हुई। क्रिजैफ सोना का प्रयोग जब अखिल भारतीय नेटवर्क परियोजना के आदिवासी उप योजना (टी.एस.पी.) के अन्तर्गत उत्तर–24 परगना (प. बंगाल), नौगांव (असम) और केन्द्रपाड़ा (ओडिशा) के कृषकों के खेतों में किया गया तो वहां भी इसी तरह के परिणाम मिले। केनॉफ के एम.टी.–150 प्रजाति में, बामरा (ओडिशा) केन्द्र पर अधिकतम हरित जैवभार (469.60 कु./है.) पाया गया जो कि 160 कि.ग्रा./है. नत्रजन स्तर पर था इसी नत्रजन स्तर पर जे.बी.एम.–204 डी का हरित जैवभार उपज 729.3 कु./है. अडुथूरई (तमिलनाडु) में था। अडुथूरई (तमिलनाडु) में मेस्ता की बुआई जब मध्य मई में 60 सें.मी. x 10 सें.मी. की दूरी पर की गयी तथा 45 दिन बुआई के पश्चात् टॉपिंग की गयी तो बीज उपज में काफी बढ़ोतरी (6.33–9.44 कु./है.) देखी गयी और इसलिए इस क्षेत्र के लिए यही अनुशंसित भी किया गया। केन्द्रपाड़ा (ओडिशा) में पिछले दो वर्षों (2013 एवं 2014) के सम्मिलित आंकड़ों का अध्ययन करने से यह पाया गया कि मेस्ता की बीज उपज में कतारों की दूरी तथा टॉपिंग के समय का कोई महत्वपूर्ण फर्क नहीं पड़ता है। आमाडालावालासा (आँध्र प्रदेश) में जब मेस्ता की बुआई जुलाई के प्रथम अथवा तृतीय सप्ताह में की गई तो बीज उपज में महत्वपूर्ण बढ़ोतरी हुई। इसमें टॉपिंग के समय तथा दूरी का कोई प्रभाव नहीं था। वहां पर 'हुद हुद' चक्रवात के कारण मेस्ता का औसत बीज उत्पादन काफी खराब रहा।

राहुरी (महाराष्ट्र) तथा अडुथूरई (तमिलनाडु) में सनई बीज उपज उस समय अधिकतम पाया गया जब एन.पी.के. की मात्रा क्रमशः 60:30:60 कि.ग्रा./है. रखी गयी। हालांकि, पोटेशियम और फॉस्फोरस के उत्तरोत्तर वृद्धि से उपज में कोई सार्थक वृद्धि नहीं देखी गयी। इन दोनों जगहों पर सनई बीज उपज पर दूरत्व का भी कोई सार्थक प्रभाव नहीं देखा गया। इसी प्रकार का ट्रेंड (चलन) प्रतापगढ़ (उत्तर प्रदेश) में भी पाया गया हालांकि, यहां 30 सें.मी. x 10 सें.मी दूरी वाले उपचार में, बीज उपज में सार्थक वृद्धि देखी गयी। साठःतीसःसाठ कि.ग्रा./है. एन.पी.के. के साथ जब सीसल वेस्ट को 20 टन प्रति है. की दर से प्रयोग किया गया तो सीसल रेशे का उपज 17.1 कु./है. था जो कि एन.पी.के. के 90:30:60 कि.ग्रा./है.+सीसल वेस्ट 20 टन/है. की दर से (20.2 कु./है.) उपचार के समकक्ष था तथा ये अन्य सभी उर्वरक उपचारों से सार्थक रूप से ज्यादा था। फ्लैक्स की अधिकतम रेशा उपज तीस अक्टूबर की बुआई (19.46 कु./है.) तथा 15 सें.मी. कतार से कतार की दूरी (15.23 कु./है.) पर प्रतापगढ़ (उत्तर प्रदेश) में देखा गया जबकि अधिकतम जैव भार 5 जनवरी की बुआई तथा 15 सें.मी. कतार दूरी पर वेलिंगटन (तमिलनाडु) में पाया गया।

फसल सुरक्षा

विभिन्न केन्द्रों में पटसन एवं समवर्गीय रेशा फसलों में फसल सुरक्षा कार्यक्रम के अन्तर्गत वर्ष 2014–15 की अवधि में 11 परियोजनाओं से सम्बन्धित कुल 38 परीक्षण किए गए ।

विभिन्न केन्द्रों में पटसन में सर्वेक्षण का कार्य कीट एवं रोगों के प्रकोप को जानने हेतु किया गया । पटसन में मुख्यतः अर्धकुण्डलक (सेमीलूपर), बिहार रोमिल सूड़ी, पीली माइट तथा घुन (स्टेम विविल) का प्रकोप पाया गया। नौगाँव में राइणो सूड़ी (इण्डिगो कैटरपिलर) (8.68 %) तथा बैरकपुर में ग्रे वीविल (67.69 %) का प्रकोप मुख्यतः पटसन पर देखा गया । पीली माइट का प्रकोप सभी केन्द्रों में पाया गया। पीली माइट का अधिकतम प्रकोप, नौगॉव, केन्द्रपाड़ा, कूचबिहार, बहराइच, कटिहार एवं बैरकपुर में क्रमशः 8.62, 10.38, 25.62, 64.45, 89.33 एवं 129.39 पीली माइट की संख्या प्रति वर्ग सेंमी (बिना मुड़ी दूसरी पत्तियों पर) बुआई के 45–75 दिनों बाद मई के आखिरी सप्ताह से मध्य जून तक पाया गया । बिहार रोमिल सूड़ी का अधिकतम प्रकोप बैरकपरु में (80.66 %), तथा नौगाँव में (12.67 %) बुआई के 75–85 दिन बाद जून–जुलाई माह में पाया गया।

पटसन अर्धकुण्डलक (सेमीलूपर) का प्रकोप कटिहार, कूचबिहार नौगाँव, केन्द्रपाड़ा व बैरकपुर में देखा गया। इसका प्रकोप उपर्युक्त जगहों पर बुआई के बाद 65 से 120 दिन (मध्य मई से अगस्त के आखिरी सप्ताह) तक क्रमशः 100, 16.36, 13.26, 41.00, तथा 20.68 प्रतिशत तक रहा। तना घुन का प्रकोप कूचबिहार तथा बहराइच को छोड़कर सभी जगहों पर पाया गया। इसका प्रकोप नौगाँव, केन्द्रपाड़ा, कटिहार व बैरकपुर में बुआई के बाद 45–85 दिन (मई के मध्य से लेकर जुलाई के मध्य सप्ताह) तक क्रमशः 4.61 %, 10.66 %, 14.3 %, तथा 53.33 % रहा। मिलीबग का प्रकोप केवल बैरकपुर में बुआई के बाद 95 दिन (जुलाई के प्रथम सप्ताह) में 6.33 प्रतिशत रहा। साधारणतया फसल वृद्धि के शुरूआती समय में पीली माइट, इंडिगो राइणो सूड़ी तथा तना घुन का जबकि, फसल वृद्धि के अंतिम दौर में बिहार रोमिल सूड़ी, अर्धकुण्ड़लक (सेमीलूपर) व मिलीबग का प्रकोप देखा गया।

पटसन में तना सड़न, जड़ गलन, एन्थ्रैकनोज तथा विषाणु रोग का प्रकोप पाया गया । पत्ती के चित्ती विषाणु रोग का प्रकोप बहराइच, केन्द्रपाड़ा व कटिहार में क्रमशः 60.90, 21.66 तथा 9.06 प्रतिशत 90–120 दिन में पाया गया । पौध झुलसा (सीडलिंग ब्लाईट) रोग का प्रकोप केवल नौगाँव (2.68 प्रतिशत) में देखा गया। एन्थ्रैकनोज का सबसे ज्यादा प्रकोप बुआई के 95 दिनों के बाद अगस्त माह में कटिहार व नौगाँव में क्रमशः 3.34 तथा 22.68 प्रतिशत था जबकि तना सड़न का प्रकोप सबसे ज्यादा नौगाँव, कूचबिहार, बहराइच, बैरकपुर, केन्द्रपाड़ा तथा कटिहार में क्रमशः 1.00, 6.18, 7.60, 7.96. 9.65 एवं 9.82 प्रतिशत जुलाई से अगस्त माह में देखा गया। जड़ गलन का प्रकोप सबसे ज्यादा नौगाँव, केन्द्रपाड़ा, कटिहार, बहराइच, कूचबिहार तथा बैरकपुर में क्रमशः 18.86, 10.41, 8.42, 4.35, 2.69 तथा 2.46 प्रतिशत पाया गया।

तोषा पटसन के जननद्रव्यों में ओ.आई.एन. 01, ओ.आई.एन.52, ओ.आई.एन. 72, ओ.आई.एन. 111, ओ.आई.एन. 77 तथा ओ.आई.एन. 32 पीली माइट के प्रति ज्यादा सहिष्णु क्रमशः केन्द्रपाड़ा तथा कूचबिहार में पाया गया। जबकि ओ.आई.एन. 112 तथा ओ.आई.एन. 17, जननद्रव्य में तना घुन का प्रकोप कम पाया गया। नौगाँव में सादा पटसन के जननद्रव्य–सी.आई.एन. 59, सी.आई.एन. 58 तथा सी.आई.एन. 107 पीली माइट से कम प्रभावित थे। जबकि सी.आई.एन. 99 तना घुन के प्रतिरोधी पाया गया। बहराइच में तना सड़न का सादा पटसन के जननद्रव्य सी. आई.एन. 06, सी.आई.एन. 15, सी.आई.एन. 11 तथा सी.आई.एन. 59 कम सहिष्णु पाये गए। जबकि सी.आई.एन. 15 तथा सी.आई.एन. 65 जड़ गलन से ज्यादा सहिष्णु पाये गये। मेस्ता जननद्रव्य में 29 लाइनें फुट तथा तना सड़न के प्रति ज्यादा सहिष्णु पाये गए। जबकि 12 लाइनें सामान्य तौर पर कम सहिष्णु पाये गए।

कूचबिहार में तना सड़न का जननद्रव्य, ओ.आई.एन 853 में 45, 65, 75, 90 दिनों में क्रमशः 1.08, 2.25, 3.16, 4.36 प्रतिशत प्रकोप पाया गया। जबकि बैरकपुर में जननद्रव्य ओ.आई.एन 853 में कम प्रकोप (2.73%) पाया गया।

बैरकपुर में माइट के प्रकोप पर पटसन बुआई की तिथियों एवं कीटनाशियों के प्रभाव का अध्ययन किया गया। यह पाया गया कि 15 अप्रैल वाली पटसन की बुआई में माइट का आक्रमण अगेती बुआई की तुलना में ज्यादा थी। इसी तरह का असर कूचबिहार, कटिहार, केन्द्रपाड़ा तथा नौगाँव में भी देखा गया। बैरकपुर में अगेती बुआई वाली पटसन में (15 अप्रैल) के साथ फेनजाक्विन 10 ई. सी (0.015%) का छिड़काव बुआई के 45 व 65 दिन के उपरान्त करने से माइट का प्रभावी नियंत्रण के साथ पटसन रेशा की उत्पादकता (30.34 कु./है.) में वृद्धि हुई। जबकि यह उपचार नौगाँव में माइट के नियंत्रण हेतु सार्थक रूप से समतुल्य नहीं रहा। सेमीलूपर एवं बिहार रोमिल सूड़ी के नियंत्रण हेतु बुआई के 70 एवं 80 दिन बाद लैम्डा साइहेलोथ्रीन 5 ई.सी. (0.00030 %) का प्रयोग आति प्रभावी रहा। पछेती बुआई की तुलना में (31.76 कु./ है.) अगेती बुआई (15 मार्च) में रेशा की उत्पादकता (36.18 कु./है.) ज्यादा थी। यही परिणाम केन्द्रपाड़ा एवं कटिहार में भी देखा गया। कूचबिहार में फेनजाक्विन 10 ई.सी. (0.015 %) के छिड़काव करने से माइट के आक्रमण में कमी के साथ–साथ, पटसन के रेशा की उपज में वृद्धि दर्ज की गयी। इसी प्रकार केन्द्रपाड़ा, में भी फेनजाक्विन एवं प्राफेनाफॉस का छिड़काव माइट एवं सेमीलूपर (अर्धकुण्डलक सूंडी) के प्रबंधन व ज्यादा रेशा उपज (26.81 कि./है.) हेतु प्रभावी था। कटिहार में सेमीलूपर (अर्धकुण्डलक सूड़ी) एवं चूषक कीटों के नियंत्रण हेतु एबामेक्टिन 1.8 ई. सी. (0.015 %) लैम्डा साइहेलोथ्रीन 5 ई. सी. (0.0003 %) से ज्यादा असरकारक थी। केन्द्रपाड़ा में समन्वित फसल प्रबंधन में अगेती बुआई (15 मार्च) पटसन में तना सड़न रोग का प्रकोप (331.99 कोडेक्स) ज्यादा पाया गया। समन्वित प्रबंधन जिसमें बीजोपचार हेतु ट्राइकोडर्मा विरीडी 10 ग्राधकि.ग्रा.बीज, ब्यूटोकलोर 2 कि. ग्रा. सक्रिय मात्रा/है. का अंकुरण पूर्व प्रयोग, कार्बेन्डाजिम 50 प्रतिशत 5 ब्लयू. पी. का 0.1 प्रतिशत एवं इन्डोसल्फान 35 ई.सी. का 0.15 प्रतिशत का पर्णीय छिड़काव 15 दिनों के अंतराल में करने से जड़ गलन के साथ रेशा उपज (29.45 कु./है.) प्राप्त हुआ।

कूचबिहार एवं नौगाँव में पारिस्थित–सह पीड़क एवं रोगनाशी प्रबंधन से यह पाया गया कि समन्वित एवं जैविक फसल संरक्षण पद्धति जिसमें कार्बनिक खाद 5 टन/है. के साथ एजोटोबैक्टर 5 ग्रा./ कि. ग्रा. बीज, फास्फेट घुलनशील जीवाणु 5 ग्रा./ कि.ग्रा बीज, ट्राइकोडरमा विरिडी 5 ग्रा./ कि. ग्रा. बीज एवं मृदोपचार 2 कि.ग्रा./है. (21 दिन) तथा स्यूडोमोनास फ्लूओरेसेंस 0.2 प्रतिशत (45 दिन) एवं नीम तेल 0.03 प्रतिशत के पर्णीय छिड़काव से तना सड़न रोग के प्रकोप में सार्थक कमी देखी गयी। जबकि बैरकपुर व कटिहार में 50 प्रतिशत नाईट्रोजनःफास्फोरसःपोटाश (30:15:15) के साथ एजोटोबैक्टर 5 ग्रा./कि.ग्रा. बीज, फास्फेट घुलनशील जीवाणु 5 ग्रा./कि.ग्रा.बीज, ट्राइकोडरमा विरिडी 5 ग्रा./कि. बीज एवं मृदोपचार 2 कि.ग्रा./ है. (21 दिन) तथा स्यूडोमोनास फ्लूओरेसेंस 0.2 प्रतिशत (45 दिन) एवं नीम तेल 0.03 प्रतिशत का छिड़काव का अधिक प्रभाव था।

नौगाँव एवं केन्द्रपाड़ा में समन्वित एवं जैविक फसल संरक्षण पद्धति जिसमें कार्बनिक खाद 5 टन/है. के साथ एजोटोबैक्टर 5 ग्रा./कि.ग्रा. बीज, फास्फेट घुलनशील जीवाणु 5 ग्रा./कि.ग्रा. बीज, ट्राइकोडरमा विरिडी 5 ग्रा./कि.ग्रा. बीज एवं मृदोपचार 2 कि.ग्रा/(21दिन) तथा स्यूडोमोनास फलूओरेसेंस 0.2 प्रतिशत (45 दिन) एवं नीम तेल 0.03 प्रतिशत के पर्णीय छिड़काव से जड़ गलन रोग के प्रकोप में सार्थक कमी देखी गयी। जबकि कूचबिहार एवं कटिहार में 50 प्रतिशत नाईट्रोजनःफास्फोरसःपोटाश (30:15:15) के साथ एजोटोबैक्टर 5 ग्रा./कि.ग्रा. बीज फास्फेट घुलनशील जीवाणु 5 ग्रा./कि.ग्रा. बीज, ट्राइकोडमा विरिडी 5 ग्रा.धकि.ग्रा. बीज एवं मृदोपचार 2 कि.ग्रा./है. (21 दिन) तथा स्यूडोमोनास फलूओरेसेंस 0.2 प्रतिशत (45 दिन) एवं नीम तेल 0.03 प्रतिशत के छिड़काव का अधिक प्रभाव देखा गया ।

अमाडालावालसा में नई पीढ़ी के 5 कवकनाशियों का मेस्ता के तना एवं जड़ सड़न (*फाइटोयोग* इनफेस्टान्स) रोग के प्रबंधन हेतु परीक्षण से यह पता चला की साईमेक्सनील 8% डब्ल्यू.पी 3 ग्रा./कि.ग्रा. बीज के बीजोपचार के साथ 0.3 प्रतिशत का पर्णीय छिड़काव 120 दिन वाली फसल के अवस्था में प्रयोग अति प्रभावी था । जबकि मेटामेक्सिल–एम.जेड़. 8 प्रतिशत डब्ल्यू.पी 2 ग्रा./कि.ग्रा. बीज के बीजोपचार के साथ 0.2 प्रतिशत का पर्णीय छिड़काव से मेस्ता रेशा के उत्पादन (34.46 किं/है.) में अधिक वृद्धि हुई।

बैरकपुर, कूचबिहार, कटिहार, नौगाँव तथा केन्द्रपाड़ा केन्द्रों में पटसन की पीली मकड़ी के जैव संगत (बायोरेशनल) प्रबंधन हेतु फसल के 35–50 दिन की अवस्था में स्पाइरोमेसिफेन 240 एस.सी. का 0.7 मि.ली./लीटर के छिड़काव का अधिक प्रभावी था।

बैरकपुर केन्द्र में पटसन की पीली मकड़ी के प्रबंधन हेतु खनीज तेल 3 मि.ली./लीटर के साथ नीम तेल 3 मि.ली. /लीटर के छिड़काव का प्रभाव 35–50 दिन में अधिक प्रभावी थी तथा 24.93 कु./है. रेशा उपज की प्राप्ति हुई । जबकि केन्द्रपाड़ा में खनिज तेल 9 मि.ली. /लीटर 35–50 दिन में अधिक प्रभावी पाया गया तथा रेशे को उत्पादन (28.41 कु./है.) प्राप्त किया गया।

केन्द्रपाड़ा, बैरकपुर, कूचबिहार, नौगाँव तथा कटिहार में नई फफूँदनाशिओं का पटसन के जटिल तना सड़न रोग के प्रबंधन हेतु परीक्षण से यह पता चला की अजोक्सीट्रोबीन व डाई फेनोकेनोजोल / मि.ली./कि.ग्रा. बीज के बीजोपचार के साथ इसकी 0.075 प्रतिशत पर्णीय छिड़काव 45 दिन में अधिक प्रभावी था तथा रेशा उत्पादन क्रमशः 26.64, 29.28, 20.85 व 29.13 कु./है. प्राप्त किया जबकि कटिहार के छोड़कर इसी तरह का प्रभाव जड़ गलन रोग पर सभी केन्द्रों में देखा गया।

बैरकपुर में तोषा पटसन के ए.वी.टी–1 तथा ए.वी.टी–2 परीक्षण प्रभेदों में कीट एवं रोगों का कोई सार्थक प्रभाव नहीं पाया गया। जबकि सादा पटसन में बिहार रोमिल सूड़ी, अर्धकुण्डक, पीली मकड़ी, तना घुन, तना सड़न तथा पिली पत्ती विषाणु का प्रकोप ए.वी.टी–1 के सभी प्रभेदों में अधिक पाया गया।

रोजेल के ए.वी.टी–1 प्रभेदों में जे.आर.आर–2012–1 (75 दिन) में तना एवं जड सड़न का प्रकोप कम पाया गया। जबकि ए.वी.टी–4 के प्रभेदों में ए.एच.एस–230 तना एवं जड़ सड़न प्रकोप कम पाया गया। सनई के ए.वी.टी– के प्रभेदों मे कोई प्रभेद रोगों के प्रति सार्थक अवरोधी नहीं पाये गये।

आमाडालवालसा में रोजेल के ए.वी.टी–I के प्रभेदों में ए.एच.एस. 254 एवं ए.बी.टी–II के प्रभेदों में ए.एच.एस.–233 रोजेल के मुख्य कीड़ों एवे पीड़कों के प्रति अवरोधी पाये गये । जबकि ए.एच.एस.–249 तना एवं जड़ सड़न रोग के प्रति अवरोधी पायी गई।

रेशा गुणवत्ता (2013–14)

तोषा पटसनः

आई.ई.टी.: कटिहार केन्द्र से प्राप्त जाँच प्रविष्टि बी.सी.सी.ओ.–9, बी.सी.सी.ओ.–8 तथा जे.आर.ओ.सी.एस.–1 की रेशा गुणवत्ता उत्कृष्ट पायी गयी।

ए.वी.टी.–I: दो जाँच प्रविष्टियों बी.सी.सी.ओ.–6 तथा जे.आर.ओ.–2011–2 की कटिहार केन्द्र से प्राप्त रेशे चेक प्रजाति से बेहतर गुणवत्ता के थे जबकि जे.आर.ओ.के.–10 एवं के.आर.ओ.–5 की रेशा गुणवत्ता चेक प्रजाति जे.आर.ओ.–8432 की अपेक्षा बेहतर पायी गयी।

सादा पटसन

आई.ई.टी.: किसी भी जाँच प्रविष्टि को चेक प्रजाति की तुलना में सतत बेहतर नहीं पाया गया जबकि बहराईच केन्द्र से प्राप्त जाँच प्रविष्टि एन.सी.जे.–28–1–1 तथा एन.डी.जे.सी.–2013 की रेशा गुणवत्ता चेक प्रजाति के समकक्ष दर्ज की गयी।

ए.वी.टी.– I: तीन केन्द्रों से प्राप्त रेशे नमूने समान रूप से बेहतर नहीं थे। बहराईच केन्द्र से प्राप्त जाँच प्रविष्टि एन.सी.जे.–28–4 की रेशा गुणवत्ता अच्छी थी जबकि केन्द्रपाड़ा से प्राप्त रेशा नमूनों में जाँच प्रविष्टि जे.आर.सी.जे.–3 की गुणवत्ता बेहतर पायी गयी।

ए.वी.टी.– II: तीन केन्द्रों से प्राप्त लगभग सभी प्रविष्टियों की रेशा दृढ़ता निम्न पायी गयी। एकमात्र जाँच प्रविष्टि एन.डी.जे.सी.–2011 की रेशा गुणवत्ता अपेक्षाकृत बेहतर दर्ज की गयी।

रोजेल

आई.ई.टी.: राहुरी केन्द्र से प्राप्त जाँच प्रविष्टि ए.एच.एस.–254 रेशे की गुणवत्ता चेक प्रजाति एच.एस.–4288 की रेशा गुणवत्ता के समकक्ष थी।

ए.वी.टी.– I: राहुरी को छोड़कर बाकी सभी केन्द्रों के जाँच प्रविष्टि ए.एच.एम.–230 की रेशा गुणवत्ता चेक प्रजाति एच.एस.–4288 से बेहतर पायी गयी।

ए.वी.टी.– II: चेक प्रजाति एच.एस.–4288 तथा ए.एम.बी.–5 की तुलना में जाँच प्रविष्टि ए.एच.एस.–216 की रेशा गुणवत्ता समानरूप से बेहतर पायी गयी।

केनॉफ

आई.ई.टी.: लगभग सभी केन्द्रों से प्राप्त नमूनों की रेशा दृढ़ता समान रूप से बेहतर थी अडुथूरई केन्द्र को छोड़कर लगभग सभी केन्द्रों से प्राप्त रेशे की गुणवत्ता बेहतर पायी गयी। केवल जे.आर.के.–2011–1 तथा जे.आर.के.–2011–2 प्रविष्टियों की रेशा गुणवत्ता चेक प्रजातियों के समतुल्य थी।

ए.वी.टी.– I: अडुथूरई को छोड़कर बाकी सभी केन्द्रों से प्राप्त रेशे नमूने उच्च गुणवत्ता के थे। सभी प्रविष्टियों की रेशा को श्रेणी एम–2 से एम.–3 के मध्य पाया गया। किसी भी प्रविष्टि की रेशा गुणवत्ता चेक प्रजाति की तुलना में बेहतर नहीं देखा गया।

सनई

आई.ई.टी. की प्रविष्टि सनई–7 तथा ए.वी.टी.– II की प्रविष्टि एस.यू.आई.एम.–77 की रेशा दृढ़ता अडुथूरई केन्द्र में बेहतर पायी गयी। ए.वी.टी.–1 की कोई भी प्रविष्टि रेशा गुणवत्ता की दृष्टि से चेक प्रजाति की तुलना में भी बेहतर नहीं थी। प्रतापगढ़ केन्द्र से प्राप्त नमूनों की रेशा दृढ़ता निम्न स्तर की पायी गयी।

फ्लैक्स

आई.ई.टी.: प्रतापगढ़ केन्द्र में जाँच प्रविष्टि जे.आर.एफ.–6 तथा जे.आर.एफ.–7 की रेशा दृढ़ता जे.आर.एफ.–2 की तुलना में बेहतर दर्ज की गयी।

रेशा गुणवत्ता (2014–15)

तोषा पटसन

आई.ई.टी.: कल्याणी केन्द्र में रेशे में कठोर जड़ का दोषपूर्ण भाग का प्रतिशत 8–25 तक था, तथा कूचबिहार केन्द्र में 10–25 प्रतिशत तक था। रेशे की दृढ़ता लगभग सभी नमूनों की औसत से अच्छी श्रेणी का पाया गया।

ए.वी.टी.– I: कल्याणी केन्द्र पर रेशा नमूनों में कठोर जड 20–35 प्रतिशत, कूचबिहार में 15–20 प्रतिशत तथा बैरकपुर केन्द्र में 8–15 प्रतिशत तथा पाया गया तथा सभी रेशे दोषपूर्ण थे। लगभग सभी रेशा नमूनों की दृढ़ता निम्न से उच्च कोटि की पायी गयी।

ए.वी.टी.– II: लगभग सभी केन्द्रों से प्राप्त रेशा नमूने पूर्णतः दोषपूर्ण तथा औसत दृढ़ता मूल्य वाले थे। रेशे अत्यन्त महीन प्रकृति के तथा उनकी श्रेणी टी.डी.–4 से टी.डी.–5 के बीच थी।

सादा पटसन

आई.ई.टी.: कल्याणी (30–40 प्रतिशत) केन्द्र को छोड़कर लगभग सभी केन्द्र से प्राप्त रेशा नमूनों में मूल सामग्री औसतन 25 प्रतिशत तक पायी गयी। रेशे अत्यन्त महीन तथा निम्न दृढ़ता के थे।

ए.वी.टी.– I: कूचबिहार को छोड़कर लगभग सभी केन्द्रों से प्राप्त रेशा नमूने डब्ल्यू.5 से डब्ल्यू.–6 श्रेणी के पाये गये।

ए.वी.टी.– II: सामान्यतया सभी केन्द्रों से प्राप्त रेशा नमूने पूर्णतया दोषपूर्ण एवं निम्न दृढ़ता मूल्य के थे। इनकी श्रेणी डब्ल्यू.–5 से डब्ल्यू.–6 के बीच थी।

रोज़ेल

आई.ई.टी. परीक्षण के सभी रेशा नमूने दोष–युक्त किन्तु अत्यन्त महीन पाये गये जिनकी श्रेणी बी.2 बी.3 के बीच थी। जबकि ए.वी.टी.–I तथा ए.वी.टी.–II के सभी नमूने उच्च दोषयुक्त परन्तु अत्यन्त महीन एवं औसत मजबूत प्रकृति के थे जिनकी श्रेणी बी.–3 अथवा इससे ऊपर की थी।

केनॉफ

आई.ई.टी. तथा ए.वी.टी.–I परीक्षण वाले लगभग सभी नमूने जो कि बैरकपुर केन्द्र से प्राप्त थे, अल्प दृढ़ता से उच्च दृढ़ता वाले पाये गये। ये अत्यन्त महीन से महीन प्रकृति तथा एम.4 श्रेणी के थे।

सनई:

आई.ई.टी. एवं ए.वी.टी.– I तथा ए.वी.टी.–II परीक्षण वाले सभी रेशा नमूने निम्न दृढ़ता से उच्च दृढ़ता मूल्य के पाये गये।

जनजातीय उप–योजना

जनजातीय उप–योजना का संचालन पश्चिम बंगाल, ओडिशा तथा असम के छह जिलों के कुल 86 हैक्टर कृषित भूमि में सुनिश्चित किया गया जिसके अन्तर्गत कुल 338 जन–जातीय कृषक लाभान्वित हुए। पश्चिम बंगाल के कूचबिहार तथा अलीपुरद्वार जिले के कृषकों के खेतों में पटसन तथा पटसन बीज उत्पादन के उन्नत तकनीकों का प्रदर्शन किया गया। क्रिजैफ द्वारा विकसित बहुकतारीय सीडड्रील से बुआई करने पर छिटकवाँ विधि की तुलना में 12 प्रतिशत तक उपज में वृद्धि दर्ज की गयी तथा 'क्रिजैफ सोना' के प्रयोग से पटसन सड़न अवधि में 6–7 दिनों की कमी तथा रेशे की उच्च गुणवत्ता के कारण प्रति कु. पाँच सौ रुपये तक की अतिरिक्त आय हुयी। ओडिशा के क्योंझड़ जिले के कृषकों में प्रचलित विधि के सापेक्ष पटसन के उन्नत उत्पादन तथा फसल संरक्षण तकनीकों के प्रक्षेत्र प्रदर्शन से औसत रेशा उत्पादन में 8–11 प्रतिशत तक की वृद्धि दर्ज की गयी तथा प्रति है. 17000–18000 रुपये तक का अतिरिक्त लाभ पाया गया। असम के नौगाँव तथा मोरीगाँव जिले में पटसन की उन्नत प्रजाति तरूण की खेती तथा उन्नत तकनीकों के समावेश से कृषकों के बीच प्रचलित तकनीकों की तुलना में 25 प्रतिशत अधिक रेशा उपज प्राप्त हुआ। 'क्रिजैफ सोना' के माध्यम से पटसन सड़न से रेशे की दृढ़ता में 1.6–3.5 ग्रा./टेक्स तक वृद्धि तथा रेशे की कीमत में भी प्रति कु. 375–500 रुपये तक का अतिरिक्त लाभ प्राप्त हुआ।

ALL INDIA NETWORK PROJECT ON JUTE AND ALLIED FIBRES

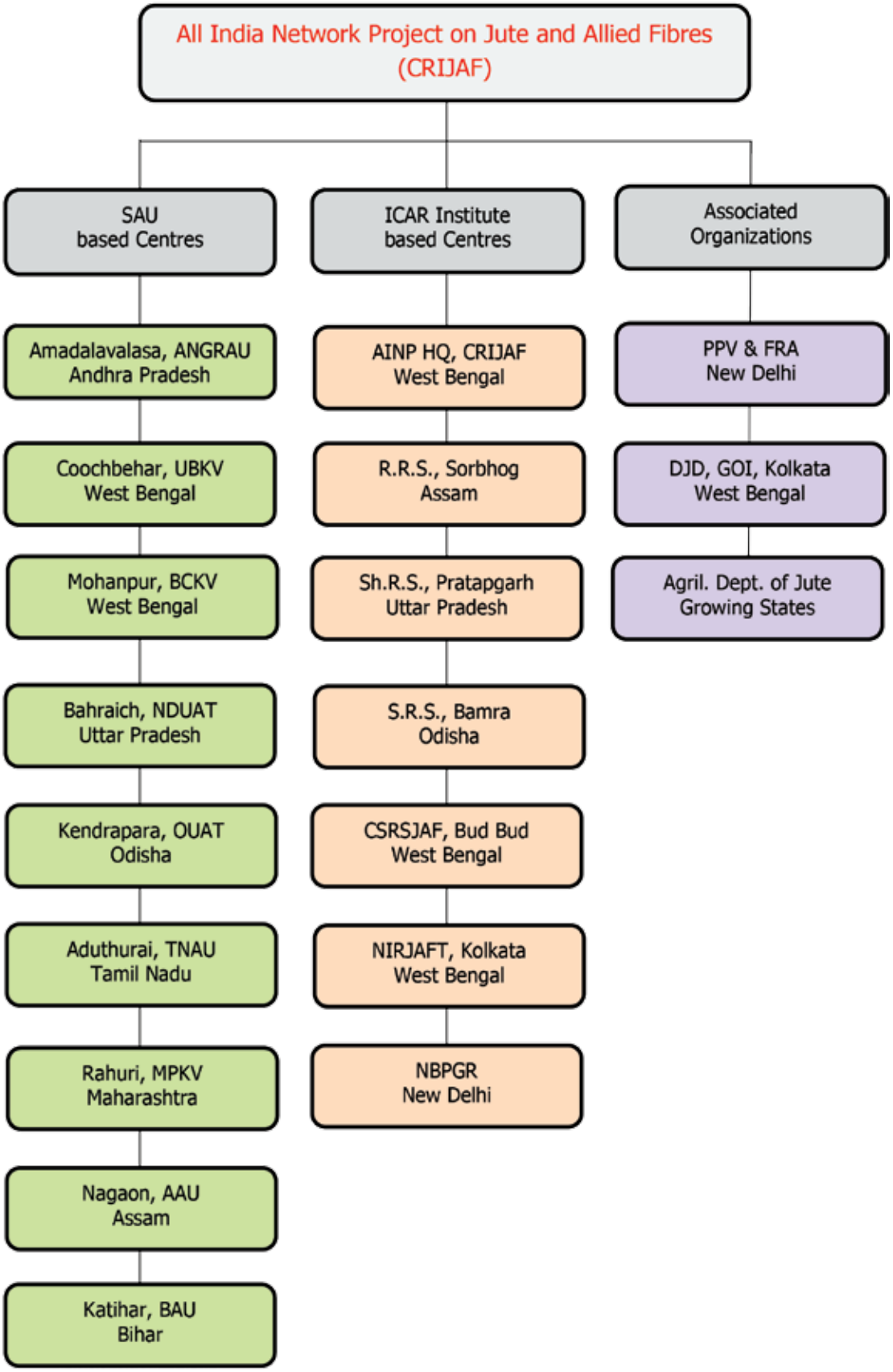
All India Coordinated Research Project on Jute & Allied Fibres (renamed All India Network Project on Jute and Allied Fibres) was sanctioned and implemented by ICAR in 1967 and the Project started functioning from its headquarters at JARI, Barrackpore, West Bengal. For a brief period during early seventies, the project functioned from JTRL, (renamed National Institute of Research for Jute and Allied Fibres Technology), but from April, 1974 it was again shifted to its present location at JARI (renamed as Central Research Institute for Jute and Allied Fibres).

The primary objective of the project was to intensify multi-disciplinary and multi-locational research to develop jute and allied fibre crops for early maturity, faster growth and production of superior quality fibre and to develop appropriate production and protection technology to ensure yield maximization and stability of production. In the initial stage (1969-70), four centres *viz.*, Jute Research Station, Nagaon, Assam; Jute Research Station, Katihar, Bihar; Jute Research Station, Kendrapara, Odisha and Jute Research Station, Bahraich, Uttar Pradesh were established. Subsequently, Agricultural Research Station, Amadalavalasa, Andhra Pradesh was added to this programme for research on mesta. Three sub-stations of CRIJAF *viz.*, Sunnhemp Research Station, Pratapgarh, Uttar Pradesh; Ramie Research Station, Sorbhog, Assam and Sisal Research Station, Bamra, Odisha were also entrusted to take up research on respective crops from 1970-71.

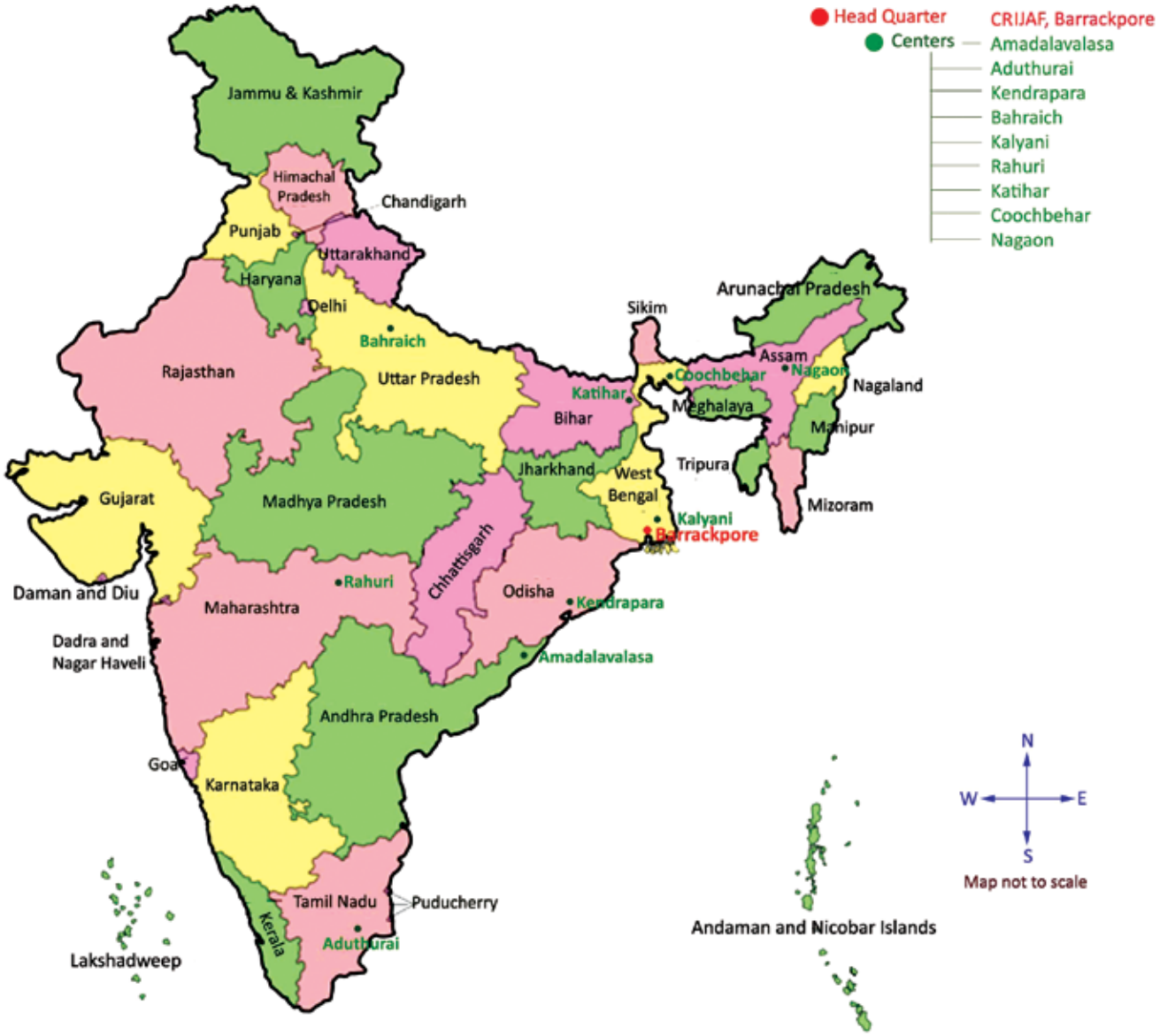
During the later part of the IVth Plan, one centre for jute at Jute Research Station, Coochbehar (WB); one centre for jute and sunnhemp at Burdwan Universty, Burdwan (WB) to take up basic research on inter-specific hybridization of jute and self-incompatibility in sunnhemp, (subsequently shifted to Bidhan Chandra Krishi Vishwa Vidyalaya, Mohanpur, West Bengal), one centre at Tamil Nadu Agricultural University, Coimbatore Tamil Nadu for jute and mesta (subsequently shifted to Rice Research Institute, Aduthurai, Tamil Nadu) and one centre at CSK, Himachal Pradesh Krishi Viswa Vidyalaya, Palampur (HP) for flax were initiated. Biology and Agriculture Division, Bhaba Atomic Research Centre, Trombay and Indian Jute Industries Research Association, Kolkata collaborated with this project since mid-seventies. Both the organizations contributed significantly in developing and testing varieties. The work on flax was taken off from the purview of this project and shifted to All India Coordinated Research Project on Linseed in April, 1990. One new centre at Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra was sanctioned by ICAR in VIIIth Plan for strengthening research on mesta, sunnhemp and jute seed production research which started functioning from 1993. In 2004, the AICRP structure was again modified as All India Network Project (AINP) on Jute and Allied Fibres.

The experiments undertaken in AINP on J&AF have its importance because of the unique system for development and multi-locational evaluation of varieties, production and protection technologies. Such types of project facilitates in variety and technology development to solve the location-specific problems in the jute growing states.

Organizational Chart



AINP ON JUTE AND ALLIED FIBRES
HEAD QUARTER AND CENTERS



Research Achievements

NP(JB)1.2: Evaluation of *C. capsularis* (white jute) germplasm

A set of seventy five accessions of *Corchorus capsularis* were screened for fibre yield and three major yield components (plant height, basal diameter and green weight) for identification of genotypes having desirable characters in six locations, *viz.* Kalyani, Bahraich, Coochbehar, Katihar, Nagaon and Kendrapara. JRC 517 and JRC 698 were used as checks. Data was not obtained from Kendrapara centre. Significant results of rest five centres are presented in table 1.1.

Kalyani: All the observations were recorded during harvestable maturity at 123 DAS (days after sowing). Plant height of the accessions ranged from 143.3 to 305.3 cm. Mean plant height of the accessions was recorded to be 248±31.2 cm. Nine accessions were taller than better check JRC 698 (269.0 cm). Basal diameter of the accessions ranged between 1.28 – 1.81 cm with a mean of 1.54±0.11 cm. Sixty four accessions exceeded basal diameter of the better check JRC 698 (1.39 cm). Green biomass/plant ranged from 117.8 – 268.5 g with a mean of 181.1±40.1 g. Mean fibre yield of the accessions was 9.0±2.2 g/plant with a range of 5.9 to 14.1 g/plant. Eight accessions outperformed JRC 517 (12.0 g/plant) for fibre yield.

Bahraich: Observations were recorded on 127 DAS at harvest stage. Average plant height in this location was 258.0±40.0 cm. Twenty three accessions outperformed better check JRC 517 (285.0 cm) for plant height. Green weight ranged from 178 g to 298 g per plant. Average fibre yield per plant was recorded to be 9.2±1.5 g. Nineteen accessions outperformed better check JRC 517 (10.0 g/plant) for fibre yield.

Capsularis germplasm trial at Bahraich

Coochbehar: Observations were recorded at 126 DAS and one check JRC 517 was used. Average plant height of the accessions in this centre was recorded to be 256.3±23.0 cm with a range of 208.5–306.5 cm. Fifteen accessions recorded higher plant height than JRC 517 (275.2 cm). Basal diameter of the accessions in this location ranged from 1.36 cm to 2.01 cm with an average of 1.69±0.16 cm. Average green biomass/plant was 222.6 g. Average fibre yield was found to be high in this location (12.7±2.8 g/plant). Eighteen accessions outperformed JRC 517 (14.8 g/plant). CIN-80 recorded highest fibre yield/plant (19.7 g).

Katihar: The crop was harvested at 130 DAS. Three accessions failed to germinate. Plant height ranged from 148.0-298.0 cm with an average of 210.3±37.2 cm. No accession surpassed checks for plant height. Mean basal diameter was found to be 1.57±0.3 cm and varied from 1.1622.30 cm in this location. Eight genotypes exceeded better check JRC 698 (1.50 cm) for this character. Green weight varied from 95.2 to 158.3 g/plant. Fibre yield/plant varied from 7.3 g to 16.8 g/plant (average 12.2±2.9 g/plant). Seven accessions outperformed better check variety JRC 517 (14.2 g/plant) for fibre yield.

Nagaon: Plant height varied from 100.7-244.0 cm with an average of 211.3±20.3 cm. Average basal diameter was 1.09±0.1 cm. Fibre yield/plant was low in this location with an average of 5.5±1.7 g/plant (range 3.0-10.4 g/plant).

Table 1.1: Fibre yield (g/plant) of 75 *C.capsularis* accessions in five locations

Accession	Kalyani	Bahraich	Coochbehar	Nagaon	Katihar	Mean
CIN-02	7.1	8.0	13.1	3.0	13.4	8.9
CIN-06	11.5	8.5	10.7	4.7	11.3	9.3
CIN-09	6.2	9.3	12.3	4.6	13.1	9.1
CIN-10	5.9	8.5	9.8	5.1	11.8	8.2
CIN-11	8.2	8.6	9.4	3.2	11.8	8.2
CIN-13	8.1	8.0	9.8	4.6	14.1	8.9
CIN-15	7.1	9.3	6.6	4.9	14.0	8.4
CIN-17	8.2	10.2	15.6	4.4	12.8	10.2
CIN-20	11.5	11.1	9.0	4.4	13.0	9.8
CIN-06	7.3	12.4	9.0	3.3	13.8	9.2
CIN-40	6.3	8.4	10.7	4.8	12.8	8.6
CIN-43	8.9	9.3	10.7	4.2	10.8	8.8
CIN-45	6.0	7.1	8.2	4.7	12.4	7.7
CIN-47	7.2	8.3	12.3	4.2	8.7	8.1
CIN-48	12.3	8.1	7.8	4.0	13.8	9.2
CIN-50	10.0	8.0	11.5	4.0	9.5	8.6
CIN-53	7.9	7.3	15.6	3.9	12.8	9.5
CIN-58	9.2	7.6	17.2	3.3	13.4	10.1
CIN-59	8.4	6.3	14.8	5.0	11.3	9.2
CIN-64	7.8	8.2	18.9	4.4	12.0	10.3
CIN-65	7.5	8.2	9.0	3.9	12.2	8.2
CIN-67	11.4	8.5	10.7	4.3	11.8	9.3
CIN-68	7.2	9.4	14.8	3.7	12.7	9.6
CIN-80	11.9	6.6	19.7	4.3	13.1	11.1
CIN-81	7.9	8.9	13.1	4.2	13.7	9.6
CIN-84	12.4	8.0	13.9	5.0	12.8	10.4
CIN-85	8.1	8.0	9.8	7.9	11.8	9.1
CIN-86	8.1	8.6	11.5	7.1	13.9	9.8
CIN-91	8.0	10.3	16.4	3.2	13.2	10.2
CIN-93	11.2	7.5	17.2	9.4	11.9	11.4
CIN-94	9.6	7.9	10.7	6.7	11.6	9.3
CIN-99	6.4	7.7	13.9	4.9	11.2	8.8
CIN-101	9.4	8.3	8.6	6.7	10.8	8.8

Accession	Kalyani	Bahraich	Coochbehar	Nagaon	Katihar	Mean
CIN-103	5.9	8.9	10.3	5.1	11.5	8.3
CIN-105	7.3	9.9	12.3	4.9	12.0	9.3
CIN-107	6.1	9.1	10.7	6.1	11.0	8.6
CIN-108	8.2	11.0	12.3	4.8	16.8	10.6
CIN-116	11.1	9.5	11.5	6.7	12.8	10.3
CIN-117	11.2	8.7	13.1	5.1	14.1	10.4
CIN-120	10.5	11.2	13.9	4.8	14.0	10.9
CIN-123	7.8	8.6	17.6	5.2	14.9	10.8
CIN-125	8.0	9.7	18.0	4.1	-	8.0
CIN-126	7.0	9.0	15.6	4.0	-	7.1
CIN-130	10.1	9.9	11.5	3.9	11.5	9.4
CIN-138	11.5	6.9	16.4	9.2	13.8	11.6
CIN-139	6.6	10.4	13.1	10.4	11.6	10.4
CIN-142	10.4	9.0	16.4	6.2	11.0	10.6
CIN-47	6.5	8.3	11.5	8.5	13.2	9.6
CIN-166	7.0	8.5	16.0	7.2	15.2	10.8
CIN-179	10.8	8.6	13.1	7.6	13.8	10.8
CIN-210	7.2	8.6	10.7	7.0	14.5	9.6
CIN-259	6.2	7.1	13.1	5.2	11.3	8.6
CIN-299	12.1	11.0	9.0	6.1	14.1	10.5
CIN-364	11.7	12.6	13.1	9.6	14.9	12.4
CIN-367	12.6	13.1	10.7	9.6	13.8	12.0
CIN-447	9.3	13.1	13.9	6.8	13.1	11.2
CIN-462	8.9	8.9	15.2	4.0	11.8	9.8
CIN-498	8.6	9.0	15.6	6.1	12.3	10.3
CIN-505	9.6	10.5	12.3	4.0	11.6	9.6
CIN-523	11.5	10.3	12.3	6.5	14.5	11.0
CIN-532	6.4	9.2	10.7	7.1	14.2	9.5
CIN-551	11.1	11.2	14.8	7.1	12.8	11.4
CEX-03	10.4	8.6	15.6	7.0	13.2	11.0
CEX-05	6.0	8.8	16.4	5.4	12.5	9.8
CEX-10	8.2	8.5	13.1	7.1	7.3	8.8
CEX-14	11.2	8.2	11.5	6.0	13.9	10.2
CEX-15	8.1	8.1	13.9	5.0	-	7.0

Accession	Kalyani	Bahraich	Coochbehar	Nagaon	Katihar	Mean
CEX-22	11.0	9.7	13.1	9.0	13.9	11.3
CEX-25	11.8	11.9	10.7	5.1	13.1	10.5
CEX-28	12.5	12.4	15.6	3.8	13.2	11.5
CEX-33	6.1	8.3	9.8	4.7	13.1	8.4
CEX-38	13.5	11.1	9.0	5.6	12.5	10.3
CEX-46	8.0	8.6	13.1	3.8	10.9	8.9
CEX-51	12.3	10.3	11.5	6.1	15.8	11.2
CEX-69	14.1	11.2	12.3	5.5	13.4	11.3
JRC 517+	12.0	10.0	14.8	7.3	14.2	11.6
JRC 698+	11.7	8.6	-	5.9	12.5	10.2
Mean	9.0	9.2	12.7	5.5	12.2	9.8
SD	2.2	1.5	2.8	1.7	2.9	1.6

+; Check variety

Overall performance

Comparative evaluation of fibre yield over locations revealed significant variability of the 75 accessions over locations. An overall mean of 9.8±1.6 g/plant was recorded for fibre yield over the five locations with a range of 7.0 g/plant (CEX-15) to 12.4 g/plant (CIN-364). A comparative description of performance of best five accessions for fibre yield over the five locations is presented in figure 1.1. Three genotypes, CIN-364, CIN-367 and CIN-138 outperformed better check JRC 517 (11.6 g/plant).

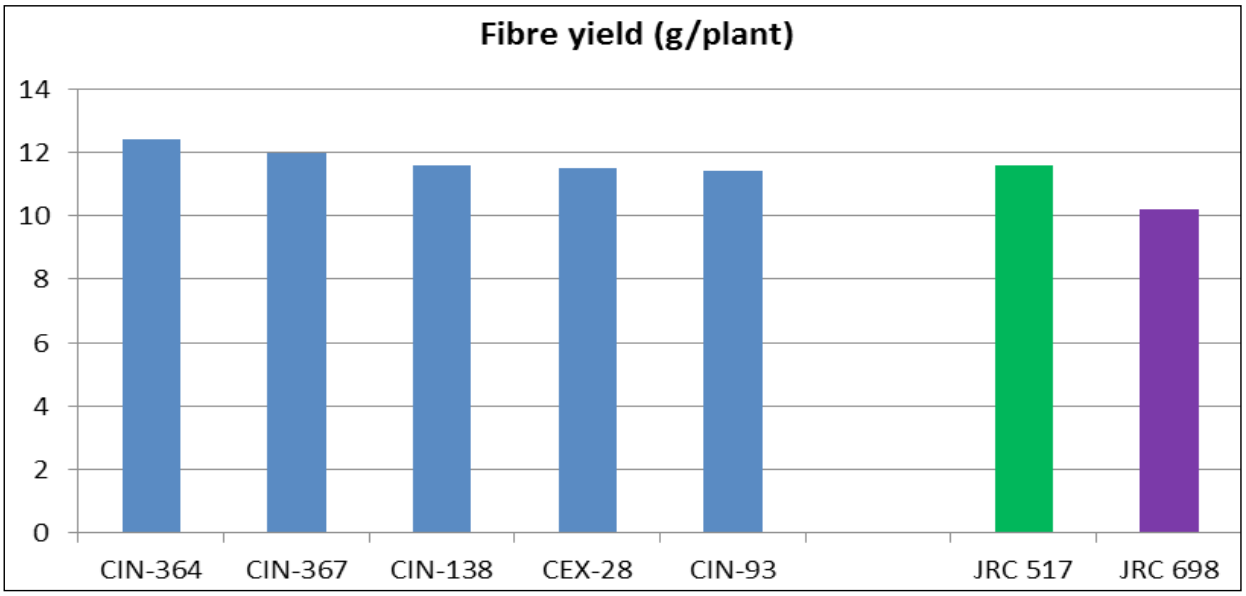


Figure 1.1. Fibre yield (g/plant) of best five accessions of *C. capsularis* over location in respect to check varieties JRC 517 and JRC 698

NP(JB)1.3: Evaluation of *C. olitorius* (*tossa* jute) germplasm

Seventy five accessions of *Corchorus olitorius* were screened for fibre yield, plant height, green weight and basal diameter in six locations, *viz.*Kalyani, Coochbehar, Nagaon, Rahuri, Katihar and Kendrapara. Two released varieties JRO 524 and JRO 204 were used as checks in the experiment. Data was not obtained from Kendrapara centre. Significant results from five locations are described below and presented in table 1.2.

Kalyani: Data was recorded for 75 accessions along with two check varieties at 124 DAS. Plant height of the *C. olitorius* accessions ranged from 225.3-312.7 cm with a mean of 281.0±20.0 cm.Average basal diameter of the accessions was 1.33±0.07 cm. Average green biomass/plant of the accessions was 188.7±43.5 g. Fibre yield/plant ranged from 5.5 g to 14.2 g with a mean of 9.7±2.4 g. Six accessions exhibited higher fibre yield than the better check JRO 524 (13.1 g/plant).

Coochbehar: Records were taken on 127 DAS at harvestable maturity. Average plant height in this location was 298.8±15.2 cm (range: 258.8-322.2 cm). Average basal diameter of the accessions was found to be 1.42±0.11 cm. Sixty two accessions exhibited higher basal diameter than best check JRO 204 (1.31 cm). Average fibre yield/plant was recorded as 13.8±2.1 g with a range of 7.7–18.2 g. Sixty nine accessions exhibited better yield than best check JRO 204 (10.8 g/plant).

Nagaon: Average plant height in this location was 259.5±17.8 cm with a range of 212.0–295.3 cm. Basal diameter varied from 0.80 to 1.13 cm with a mean of 0.97 cm. Wide variation was observed for fibre yield (2.8 – 12.0 g/plant) with a mean of 5.9 g/plant. Eight accessions surpassed fibre yield of best check JRO 204 (8.9 g/plant).

Rahuri: The crop was sown late on 22.06.2014 and data was recorded on 71 genotypes. Plant height ranged from 203.9 cm to 292.8 cm with a mean value of 247.1±14.9 cm. No accession was taller than check JRO 204 (298.8 cm). Basal diameter varied from 1.28 to 2.17 cm with a mean of 1.61±0.17 cm. Five accessions surpassed best check JRO 524 (1.85 cm) for basal diameter. Average green biomass showed high variation (range: 139.0 – 505.0 g/plant). Fibre yield ranged from 4.8 to 13.2 g/plant with a mean of 8.1±1.9 g/plant.

Olitorius germplasm trial at Rahuri

Katihar: the crop was sown on 21.04.2014 and harvested on 25.08.2014. Mean height of the accessions was found to be 264.6±36.2 cm with a range of 194-348 cm. Twenty eight genotypes were taller than better check JRO-524 (270 cm). Average basal diameter was recorded to be 1.53±0.18 cm with a range of 1.29-2.13 cm. Average green biomass and fibre yield/plant were 130.9±14.4 g and 12.3±2.1 g, respectively. Fifty accessions exhibited higher yield than best check JRO 524 (11.4 g/plant).

Table 1.2: Fibre yield (g/plant) of 75 *C.olitorius* accessions in five locations

Genotype	Kalyani	Coochbehar	Nagaon	Rahuri	Katihar	Mean
OIN-01	12.2	16.0	4.3	6.5	16.8	11.2
OIN-03	10.5	16.0	3.9	8.5	14.1	11.1

Genotype	Kalyani	Coochbehar	Nagaon	Rahuri	Katihar	Mean
OIN-06	9.6	13.8	3.3	8.6	14.5	10.0
OIN-09	8.1	14.1	5.8	8.7	15.7	10.5
OIN-15	11.5	12.2	5.3	8.9	12.8	10.1
OIN-17	8.3	18.3	5.1	8.8	10.6	10.2
OIN-18	7.5	17.2	6.9	6.9	11.8	10.0
OIN-22	9.9	13.8	5.8	5.9	12.0	9.5
OIN-25	9.9	16.0	2.9	8.1	11.8	9.8
OIN-30	7.8	14.9	5.4	8.8	11.8	9.7
OIN-32	7.2	15.5	7.3	9.5	11.6	10.2
OIN-38	11.7	14.4	4.9	11.4	10.6	10.6
OIN-40	13.4	13.8	5.3	7.9	11.3	10.3
OIN-41	11.5	13.8	7.2	5.2	10.8	9.7
OIN-48	12.2	13.0	6.0	5.1	8.0	8.8
OIN-49	11.8	10.5	5.1	6.8	13.3	9.5
OIN-52	11.9	14.4	4.2	7.2	13.4	10.2
OIN-59	11.1	10.0	5.4	8.3	13.1	9.6
OIN-60	11.6	11.6	4.7	9.9	11.2	9.8
OIN-62	11.0	7.7	2.8	9.1	14.1	8.9
OIN-63	10.6	11.6	3.0	7.4	15.5	9.6
OIN-65	9.6	13.3	5.1	7.1	14.0	9.8
OIN-68	12.1	13.8	4.4	8.5	14.5	10.7
OIN-69	12.7	16.6	5.2	7.7	10.9	10.6
OIN-71	13.3	12.5	5.8	8.0	15.5	11.0
OIN-72	10.0	10.0	6.7	7.7	11.5	9.2
OIN-73	6.0	12.2	6.3	9.0	12.8	9.2
OIN-74	11.8	15.5	5.0	8.7	6.9	9.6
OIN-76	9.6	13.3	4.2	6.4	11.3	8.9
OIN-77	9.3	18.3	4.1	6.7	10.3	9.7
OIN-83	9.1	16.0	6.2	7.8	14.8	10.8
OIN-84	5.6	16.0	4.8	7.9	12.3	9.3

Genotype	Kalyani	Coochbehar	Nagaon	Rahuri	Katihar	Mean
OIN-86	7.8	16.0	5.1	7.4	8.7	9.0
OIN-93	12.1	12.5	5.0	6.8	10.9	9.5
OIN-94	10.5	11.3	4.7	4.7	11.2	8.5
OIN-104	11.3	11.1	3.7	7.5	12.5	9.2
OIN-108	7.3	13.8	4.0	7.6	12.1	9.0
OIN-111	5.6	14.9	5.1	9.6	12.7	9.6
OIN-112	8.0	14.4	6.0	10.5	11.5	10.1
OIN-113	7.9	11.3	6.3	7.5	9.4	8.5
OIN-116	7.2	16.6	6.1	5.7	9.5	9.0
OIN-128	6.1	12.2	6.0	7.7	11.0	8.6
OIN-130	12.5	11.1	5.7	6.0	10.3	9.1
OIN-133	8.6	14.9	5.0	10.1	7.9	9.3
OIN-134	9.0	13.0	4.9	8.0	14.2	9.8
OIN-136	8.6	13.8	6.4	7.7	11.8	9.6
OIN-138	12.3	12.2	9.0	7.4	11.0	10.4
OIN-141	6.2	17.7	9.3	8.3	12.4	10.8
OIN-142	9.4	16.6	6.8	6.7	8.5	9.6
OIN-145	6.4	16.0	10.1	6.7	10.3	9.9
OIN-147	6.4	14.1	6.8	4.5	11.6	8.7
OIN-148	12.5	13.8	6.0	9.9	10.8	10.6
OIN-156	7.1	16.0	5.0	5.1	11.5	8.9
OIN-421	7.2	15.5	6.3	4.9	12.4	9.3
OIN-471	7.6	12.2	9.2	9.4	10.6	9.8
OIN-490	7.4	14.4	5.8	6.9	17.1	10.3
OIN-508	6.5	14.4	5.5	6.1	13.4	9.2
OIN-559	8.9	13.3	5.9	6.0	14.4	9.7
OIN-617	12.6	12.7	3.8	6.7	15.2	10.2
OIN-647	7.1	13.8	5.9	8.3	15.6	10.2
OIN-656	8.5	15.2	7.4	7.5	12.1	10.1
OIN-1041	8.0	14.4	5.7	10.3	15.2	10.7

Genotype	Kalyani	Coochbehar	Nagaon	Rahuri	Katihar	Mean
OIN-1123	7.5	12.2	4.7	7.1	14.3	9.2
OIJ-63	14.0	13.6	7.0	12.9	14.6	12.4
OIJ-88	12.6	14.1	7.4	13.2	14.8	12.4
OIJ-211	9.5	14.4	6.6	9.6	14.2	10.9
OIJ-226	13.9	14.9	12.0	8.1	12.1	12.2
OIJ-241	13.0	17.7	6.1	8.2	14.2	11.8
OIJ-276	6.2	12.7	6.1	9.5	11.3	9.1
OIJ-278	8.8	14.4	6.0	12.4	13.5	11.0
OIJ-296	7.4	10.5	7.1	11.4	11.3	9.5
OEX-05	13.9	12.2	7.0	-	12.8	11.5
OEX-09	14.2	13.3	9.8	-	11.8	11.5
OEX-13	7.4	11.1	9.6	-	11.8	10.0
OEX-29	12.8	10.2	9.2	8.2	11.8	11.5
JRO 524+	13.1	8.9	7.6	10.1	11.4	10.2
JRO 204+	12.5	10.8	8.9	13.3	11.3	10.9
Mean	9.7	13.8	5.9	8.1	12.3	10.0
SD	2.4	2.1	1.7	1.9	2.1	0.9

+ Check variety

Overall performance

Comparative evaluation of fibre yield over locations revealed significant variability of the accessions (including check) over five locations (table 1.2). Average fibre yield over the locations was recorded to be 10.0±0.9 g/plant with a range of 8.5 to 12.4 g/plant. Twelve genotypes outperformed better check JRO 204 (10.9 g/plant) for fibre yield (figure 1.2).

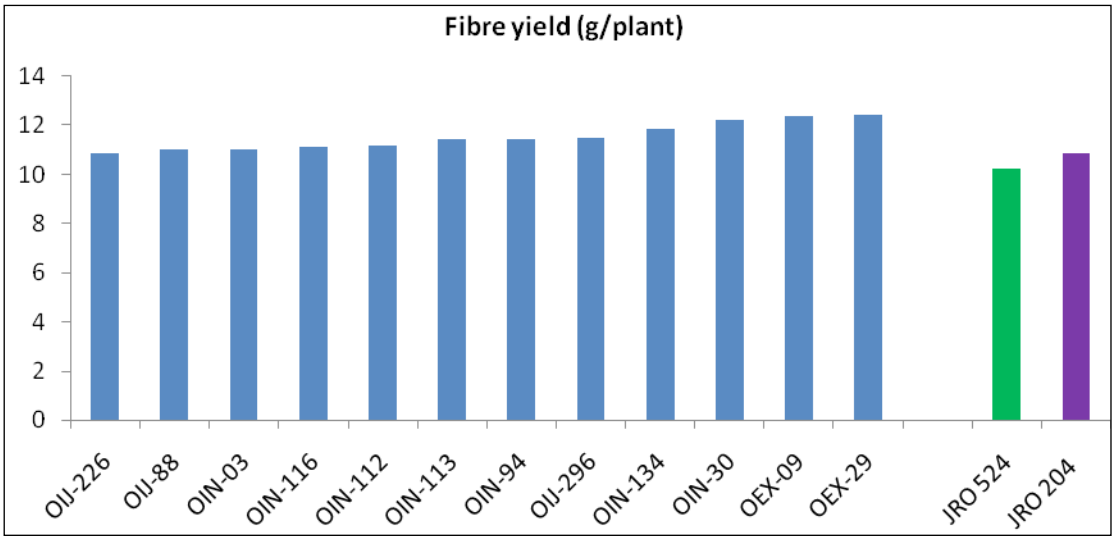


Figure 1.2. Fibre yield (g/plant)of best 12 *C. olitorius* accessions over five locations

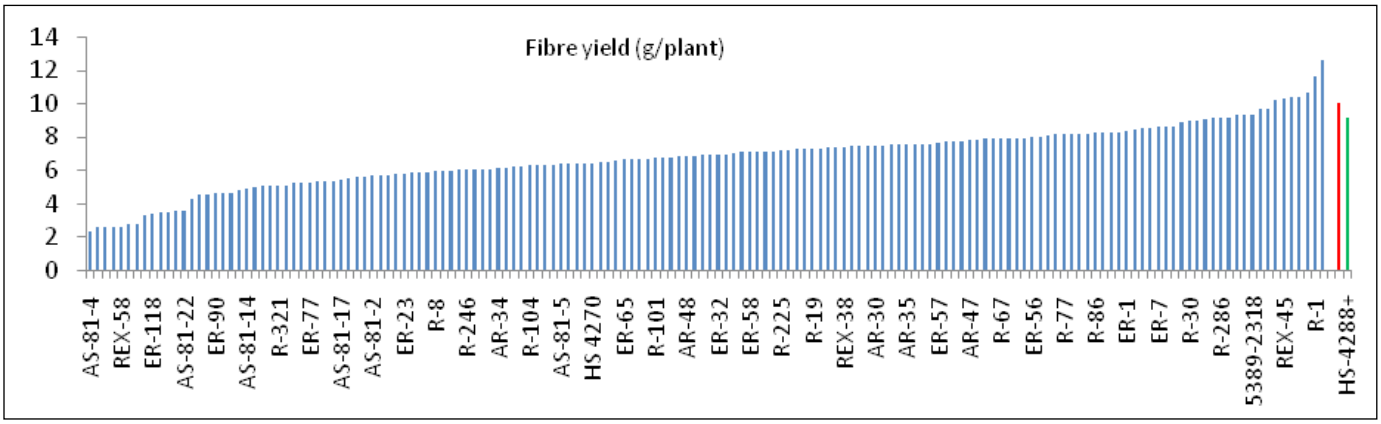
NP(MB)1.2: Evaluation of roselle germplasm

A total of 158 roselle (*Hibiscus sabdariffa*) accessions with two checks (HS 4288 and AMV 5) were evaluated in Amadalavalasa and Barrackpore centres.

Amadalavalasa: The crop was sown on 13.06.2014 and harvested on 19.11.2014. Plant height ranged from 149.0 – 315.0 cm with an average of 246.4±34.0 cm. Basal diameter in this location ranged from 9.5 – 16.7 cm (mean 12.6±1.3 cm). Green biomass/plant varied greatly (61.2 – 225 g). Fibre yield/plant also showed high variability (2.0 – 13.0 g) with an average of 7.5±2.2 g. Thirty six accessions outperformed check varieties for fibre yield.

Barrackpore: The crop was sown on 18.07.2014 and harvested on 26.12.2014. Average plant height was recorded as 223.2±31.0 cm (range 120.0 – 290.0 cm). Basal diameter ranged from 7.0 cm to 17.2 cm with a mean of 10.9±1.5 cm. Green biomass/plant varied greatly from 30.0 g to 336.0 g. Fibre yield/plant also varied widely from 1.6 g to 15.3 g.

Overall, average fibre yield over two locations was 6.8±1.8 g/plant. Seven accessions exhibited higher fibre yield than the best check AMV 5 (10.1 g/plant). Accession ER-52 (12.6 g/plant) showed highest fibre yield. Comparative fibre yield of 158 accessions and two checks are presented in figure 1.3.



+Check variety

Figure 1.3. Fibre yield (g/plant) of 160 roselle genotypes averaged over two locations, Amadalavalasa and Barrackpore

NP (MB) 1.3: Evaluation of kenaf germplasm

A total of 75 accessions of kenaf (*H. cannabinus*) with two checks HC 583 and AMC 108 have been evaluated at Aduthurai centre (table 1.3). Plant height ranged from 135.0 cm to 225.0 cm with an average of 179.3±20.6 cm. Average basal diameter was 1.2±0.2 cm (range 0.9 – 1.9 cm). Average green biomass was 155.0±46.3 cm. Fibre yield ranged from 3.2 g/plant to 17.0 g/plant with a mean of 6.7±2.5 g/plant. Only one accession, KIJ-164 (17.0 g/plant) outperformed best check AMC 108 (12.0 g/plant) for fibre yield.

Table 1.3: Performance of kenaf germplasm at Aduthurai

Genotypes	Plant height (cm)	Basal diameter (cm)	Green weight (g/plant)	Fibre yield (g/plant)
KIJ - 73	160.0	1.2	142.0	6.5
KIJ - 78	192.0	1.3	102.0	6.6
KIJ - 80	192.0	1.3	112.0	5.0
KIJ - 81	190.0	1.3	133.0	6.7
KIJ - 86	187.0	1.2	157.0	6.6

Genotypes	Plant height (cm)	Basal diameter (cm)	Green weight (g/plant)	Fibre yield (g/plant)
KIJ - 87	172.0	1.2	190.0	5.0
KIJ - 92	135.0	1.0	122.0	5.0
KIJ - 94	181.0	1.1	165.0	3.3
KIJ - 97	225.0	1.5	217.0	8.3
KIJ - 98	169.0	1.0	152.0	6.6
KIJ - 100	178.0	1.3	225.0	10.0
KIJ - 102	217.0	1.2	183.0	6.6
KIJ - 103	161.0	1.2	147.0	6.5
KIJ - 104	190.0	1.2	160.0	6.7
KIJ - 105	180.0	1.2	253.0	10.0
KIJ - 106	197.0	1.2	258.0	8.3
KIJ - 110	175.0	1.2	125.0	3.3
KIJ - 113	175.0	1.2	153.0	6.4
KIJ - 114	200.0	1.2	241.0	10.0
KIJ - 115	203.0	1.3	217.0	8.3
KIJ - 117	200.0	1.3	123.0	3.3
KIJ - 119	189.0	1.2	173.0	8.3
KIJ - 120	158.0	1.1	78.0	3.3
KIJ - 134	159.0	1.2	108.0	5.0
KIJ - 135	148.0	1.1	120.0	3.3
KIJ - 136	165.0	1.1	182.0	3.2
KIJ - 137	180.0	1.4	158.0	6.5
KIJ - 140	149.0	1.1	208.0	8.8
KIJ - 155	187.0	1.2	148.0	6.7
KIJ - 159	180.0	1.0	208.0	8.8
KIJ - 160	177.0	1.1	177.0	6.8
KIJ - 161	177.0	1.2	147.0	6.7
KIJ - 162	145.0	1.9	135.0	5.0
KIJ - 163	162.0	1.2	243.0	11.0
KIJ - 164	170.0	1.3	233.0	17.0
KIJ - 165	185.0	1.2	233.0	10.0
KIJ - 166	180.0	1.1	203.0	6.8
KIJ - 234	163.0	1.0	142.0	5.0
KIJ - 304	165.0	1.1	102.0	3.4
KIJ - 332	160.0	1.1	210.0	8.3
KIJ - 23	220.0	1.7	93.0	3.3
KIN - 24	193.0	1.3	97.0	5.0
KIN - 30	225.0	1.6	86.0	3.5

Genotypes	Plant height (cm)	Basal diameter (cm)	Green weight (g/plant)	Fibre yield (g/plant)
KIN - 31	190.0	1.4	95.0	5.0
KIN - 34	215.0	1.4	108.0	5.2
KIN - 35	200.0	1.4	108.0	5.3
KIN - 62	155.0	1.3	97.0	3.2
KIN - 63	205.0	1.4	130.0	5.0
KIN - 96	190.0	1.0	88.0	3.4
KIN - 100	180.0	1.3	207.0	6.5
KIN - 101	190.0	1.2	188.0	10.0
KIN - 102	225.0	1.3	125.0	6.7
KIN - 103	201.0	1.2	153.0	6.8
KIN - 124	165.0	1.2	180.0	6.5
KIN - 138	175.0	1.1	187.0	6.4
KIN - 139	168.0	1.1	116.0	12.0
KIN - 142	160.0	1.2	183.0	8.3
KIN - 149	180.0	1.2	173.0	8.4
KIN - 157	175.0	1.3	146.0	6.2
KIN - 172	175.0	1.3	146.0	8.3
KIN - 176	185.0	1.1	100.0	5.0
KIN - 177	185.0	1.3	83.0	5.4
KIN - 180	145.0	0.9	125.0	5.0
KIN - 181	155.0	0.9	120.0	5.2
KIN - 187	180.0	1.1	103.0	5.3
KIN - 192	150.0	1.1	172.0	8.4
KIN - 205	147.0	1.1	188.0	6.2
KIN - 211	180.0	1.1	110.0	5.0
KIN - 215	150.0	0.9	112.0	8.1
KIN - 226	170.0	1.0	155.0	5.0
KIN - 230	160.0	0.9	140.0	5.0
KEX - 55	200.0	1.4	155.0	10.0
KEX - 82	200.0	1.3	152.0	10.0
KEX - 96	170.0	1.1	220.0	8.4
KEX -117	205.0	1.4	200.0	11.0
HC 583+	260.0	1..85	272.0	11.0
AMC 108+	275.0	2.0	280.0	12.0
Mean	179.3	1.2	155.0	6.7
SD	20.6	0.17	46.3	2.5

+Check variety

National Hybridization Programme (NHP)

The National hybridization programme of jute and mesta involves development of cross combinations and evaluation of progenies at different testing centres.

NP(JB)2.1: NHP with *C. capsularis*– Evaluation of F_4 progenies

This year, the F_4 progenies of different cross combinations were evaluated in five centres, *viz.*, Kalyani, Coochbehar, Katihar, Bahraich and Kendrapara. Data was not received from Baharaich centre. A summary of results is provided in table 1.4.

Kalyani: F_4 progenies of 29 cross combinations were sown on 07.04.2014 and observations were recorded on 08.08.2014. Plant height ranged from 172.7 cm to 287.7 cm with a mean value of 245.5±27.1 cm. The cross combination CEX-048 × JRC 321 produced tallest progenies. Basal diameter ranged from 1.37 cm to 1.74 cm with an average of 15.5±0.1 cm. Average green weight was recorded as 210.8±21.3 g/plant. Fibre yield varied from 8.0–13.8 g/plant with an average of 10.5±1.4 g/plant. Progenies of the cross combination CIN-149 × JRC 321 recorded highest fibre yield (13.8 g/plant).

Kendrapara: The F_4 populations exhibited an average plant height of 235.2±26.6 cm (range: 196.0-292.0 cm). Basal diameter varied from 1.2 cm to 1.6 cm with a mean of 1.40±0.11 cm. Average green biomass was low (83.1±0.2 g/plant). Average fibre yield/plant was also low (9.1±2.5 g) with high variability (5.5 – 16.3 g). No populations surpassed best check JRC 698 (18.3 g/plant) for fibre yield.

Coochbehar: In this centre, the F_4 populations were sown late on 05.06.2014 and were harvested on 04.10.2014. Progenies of 30 cross combinations with two checks were grown. Plant height ranged from 230.4 cm to 318. 9 cm. Populations from eight cross combinations exhibited higher plant height than best check JRC 698 (273.8 cm). Average basal diameter was 1.89±0.19 cm. Average fibre yield/plant of the populations was recorded to be 10.2±2.1 g. Progenies of CIJ-100 × JRC 212 surpassed best check JRC 698 for green biomass (230.5 g/plant) and fibre yield (14.3 g/plant).

Katihar: In this centre, KTC 1 and JRC 321 were used as check. Average plant height was recorded to be 224.5±18.2 cm. Basal diameter varied from 1.38 cm to 2.40 cm with a mean of 1.85±0.29 cm. Green biomass/plant ranged from 123.3 g to 204.2 g with an average of 167.3±21.8 g. Average fibre yield was 15.8±2.1 g/plant. Progenies from 11 cross combinations outperformed better check JRC 321 (16.4 g/plant). Highest fibre yield was exhibited by progenies of CEX-040 x CEX-048 (19.1 g/plant).

Table 1.4: Performance of F4 progenies of *C. capsularis* at different centres

Kendrapara		Coochbehar		Kalyani		Katihar	
Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)
CEX-040 × JRC-212	16.30	CIN-117 × JRC-321	7.83	CIN-117 ×CIJ-100	12.72	CEX-048 × CEX-040	17.42
CEX-048 × JRC-212	8.30	CIN-117 × JRC-212	10.55	CIN-117 ×JRC-212	9.24	CIJ-100 × CEX-048	15.25
CIJ -100 × JRC-212	10.70	CIN-149 × JRC-321	9.15	CIN-117 × JRC-321	9.80	CEX-040 × CIJ-140	16.33
CIJ -140 × JRC-212	5.90	CEX-040 × CIJ-100	8.57	CIN-117 ×CIN-149	8.05	CEX-040 × CEX-048	16.62

Kendrapara		Coochbehar		Kalyani		Katihar	
Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)
CIN -117 × JRC-212	7.90	CIJ-100 × CEX-048	7.96	CIN-117 ×CEX-048	11.01	CIN-117 × CEX-048	11.80
CIN -149 × JRC-212	8.80	CIJ-140 × JRC-212	8.69	CIN-117 × JRC-212	10.80	CEX-048 × CIN-149	12.83
CEX-040 × JRC-321	7.90	CIN-149 × CEX-048	7.22	CIN-149 × CIJ-140	10.26	CEX-048 × JRC 212	16.52
CEX-048 × JRC-321	9.10	CEX-040 × JRC-212	7.96	CIN-149 × JRC-321	13.77	CIN-117 × JRC-212	13.66
CIJ-100 × JRC-321	5.90	CIJ-140 × CIN-149	8.69	CIN-149 ×CEX-048	10.15	CIN-149 × CIJ-140	18.87
CIJ-140 × JRC-321	5.50	CIN-149 × JRC-212	11.30	CEX-048 ×JRC-321	9.47	CEX-048 × CIJ-100	12.01
CIN-117 × JRC-321	7.60	CEX-048 × CEX-040	7.03	CEX-048 ×CIN – 149	10.98	CEX-048 × JRC-212	15.95
CIN-149 × JRC-321	9.80	CEX-040 × CIN-149	12.90	CEX-048 ×CEX-040	12.83	CEX-040 × CIJ-100	17.55
CEX-048 × CEX-040	10.90	CIJ-100 × JRC-212	14.29	CEX-048 ×JRC-212	10.23	CIN-117 × JRC-212	12.36
CEX-040 × CEX-048	6.90	CEX-048 × JRC-212	12.77	CEX-048 × CIJ-100	10.73	CIN-117 × JRC-212	13.66
CIJ -100 × CEX-048	12.80	CIN-117× CEX-048	12.14	CEX-040 ×CIN-149	11.49	CIN-117 × CIJ-100	17.87
CIN-117 × CEX-048	7.60	CEX-040 × CEX-048	11.76	CEX-040 ×CIJ – 140	8.44	CEX-040 × JRC-212	16.67
CIN-149 × CEX-048	10.20	CIN-149 × CIJ-140	10.75	CEX-040 × CIJ-100	10.73	CEX-040 × CIJ-100	18.99
CEX-040 × CIJ-100	9.20	CEX-040 × JRC-321	12.65	CEX-040 ×CIN-117	8.29	CEX-040 × CIJ-100	17.08
CEX-048 × CIJ-100	7.20	CEX-040 × CIN-117	9.61	CEX-040 ×CEX-048	12.77	CIN-117 × JRC-212	14.84
CIN-117 × CIJ-100	7.10	CEX-040 × CIJ-140	12.07	CEX-040 ×JRC-321	10.73	CIJ-100 × CEX-048	15.05
CEX-040 × CIJ-140	8.30	CEX-048 × CIN-149	9.96	CEX-040 ×JRC-212	9.82	CEX-040 × CIJ-100	16.03
CIJ -100 X CIJ-140	10.80	CIJ-140 × JRC-321	10.58	CIJ-100 × CIN-149	9.20	CEX-048 × JRC-212	17.50
CIN-149 × CIJ-140	7.80	CIJ-100 × CIJ-140	10.33	CIJ-100 × JRC-212	10.91	CIN-149 × JRC-212	15.56
CEX-040 × CIN-117	11.60	CIN-117 × CIJ-100	13.39	CIJ-100 ×CEX-048	12.80	CEX-040 × CEX-048	19.14
CEX-048 × CIN-117	14.80	CIJ-100 × CIN-149	10.80	CIJ-100 × JRC-321	8.75	KTC-1+	16.15

Kendrapara		Coochbehar		Kalyani		Katihar	
Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)	Parentage	Fibre yield (g/plant)
CEX-040 × CIN-149	10.30	CEX-048 × CIN-117	13.39	CIJ-100 × CIJ-140	8.63	JRC-321+	16.37
CEX-048 × CIN-149	9.20	CIN-117 × CIN-149	8.61	CIJ-140 × JRC-212	9.89		
CIJ -100 × CIN-149	7.90	CEX-048 × JRC-321	7.52	CIJ-140 × JRC-321	11.54		
CIJ -140 × CIN-149	9.30	CEX-048 × CIJ-100	8.21	CIJ-140 × CIN-149	10.67		
CIN -117 × CIN-149	6.70	CIJ-100 × JRC-321	8.62				
JRC 321+	10.20	JRC-321+	13.19				
JRC 698+	18.30	JRC-698+	14.14				

NP(JB)2.2: NHP with *C. oliotrius* - Evaluation of F_3 progenies

The F_3 progenies of different cross combinations were evaluated in five centres, *viz*., Kalyani, Coochbehar, Katihar, Rahuri and Kendrapara.

Katihar: F_3 progenies from 36 cross combinations were tested in this location with checks JRO-524 and JRO-204. Average plant height was recorded as 338.1±10.1 cm (range: 315.0 – 362.0 cm). Basal diameter varied from 1.45 cm to 2.02 cm with a mean of 1.73±0.15 cm. Average green biomass of the progenies was recorded as 120.2±26.5 g/plant. Fibre yield/plant ranged from 7.2 g to 19.0 g, with an average of 11.2±3.0 g. The cross combination JRO 128 X JRO 878 recorded highest yield (19.0 g/plant).

Rahuri: Progenies of 36 cross combinations were tested in this location with checks JRO-524 and JRO-204. The plant height of the F_3 progenies ranged from 205.6 cm to 256.3 cm, with a mean of 231.3±11.0 cm. Mean basal diameter was recorded as 1.52±0.13 cm. Green biomass varied greatly from 98.3 g/plant to 258.0 g/plant. Average fibre yield in this location was 7.4±1.3 g/plant. The cross combination OIN-217 x JRO 620 recorded highest fibre yield/plant (10.1 g) marginally outperforming best check JRO 204 (9.8 g).

Coochbehar: F_3 progenies from 36 cross combinations were evaluated in this location under late sowing (05.06.2014) condition with two checks, JRO-524 and JRO-204. Plant height ranged from 273.1 to 332.3 cm. Average basal diameter was 1.81±0.15 cm with a range of 1.47 – 2.19 cm. Green biomass of the F_3 progenies varied from 106.3 g/plant to 255.6 g/plant with a mean of 164.5±32.2 g/plant. Fibre yield ranged from 10.0 g/plant to 24.2 g/plant. Fibre yield from the cross combination OIJ 015 × OIN 580 (24.2 g/plant) and OIN 580 × JRO 878 (22.1 g/plant) were highest.

Kalyani: F_3 generations of 36 crosses were evaluated for plant height, basal diameter, green biomass and fibre yield with two checks, JRO-524 and JRO-204. Average plant height of the cross combinations was recorded to be 299.9±14.5 cm. Population mean of cross combination (OIN-028 × JRO – 128) was highest (326.7 cm) for this character. Basal diameter of the cross combinations ranged from 1.18 to 1.51 cm with an average of 1.34±0.07 cm. Green biomass/ plant ranged from 151.5 – 251.5 g with an average of 188.1±25.8 g. Average fibre yield was recorded to be 9.4±1.4 g/plant. Nine populations exhibited higher fibre yield than better check JRO 204 (10.2 g/plant)(table 1.5).

Kendrapara: Plant height of 36 F_3 progenies ranged from 125.0 cm to 237.0 cm. Average plant height was 178.5±25.9 cm. Basal diameter varied from 1.02 cm to 1.19 cm. The progenies exhibited low green biomass (average 34.5±7.0 g/plant) and low fibre yield (4.4±1.5 g/plant).

Overall, the 36 progenies at five locations exhibited a mean fibre yield of 9.2±0.9 g/plant. Progenies from the cross combination OIJ-015 X OIN-028 exhibited highest fibre yield over locations (12.3 g/plant) surpassing best check JRO 204 (11.5 g/plant) (table 1.5).

Table 1.5: Mean fibre yield (g/plant) of 36 *C. olitorius* progenies (F3) evaluated at five locations

Parentage	Location				
	Katihar	Rahuri	Coochbehar	Kalyani	Kendrapara
OIJ-015 X OIN-028	11.8	8.6	20.1	12.1	8.3
OIJ-015 X OIN-217	7.8	9.0	15.4	10.2	3.4
OIJ-015 X OIN-574	7.2	6.9	17.0	11.5	4.0
OIJ-015 X OIN-580	8.3	7.4	24.2	7.5	3.8
OIJ-015 X JRO-620	10.6	8.8	17.2	7.9	5.1
OIJ-015 X OIJ-267	7.7	7.5	15.8	8.2	3.3
OIJ-015 X JRO 128	11.0	5.1	18.1	9.4	4.1
OIJ-015 X JRO 878	19.0	6.0	13.4	12.9	3.7
OIN-028 X OIN-217	9.7	7.4	19.1	10.4	3.4
OIN-028 X OIN-574	11.7	8.8	14.0	7.4	2.2
OIN-028 X OIN-580	13.0	8.7	13.0	9.6	4.2
OIN-028 X JRO 620	11.3	7.4	16.1	11.8	2.5
OIN-028 X OIJ-267	8.5	8.0	13.8	11.7	5.6
OIN-028 X JRO 128	18.7	6.9	12.9	9.6	3.8
OIN-028 X JRO 878	13.2	6.6	15.8	10.5	4.3
OIN-217 X OIN-574	9.9	7.8	14.0	8.0	3.8
OIN-217 X OIN-580	11.4	7.3	13.1	10.1	3.0
OIN-217 X JRO 620	13.2	10.1	13.0	9.1	3.2
OIN-217 X OIJ-267	9.5	9.8	10.5	7.5	3.0
OIN-217 X JRO 128	13.4	8.0	15.6	9.4	4.7
OIN-217 X JRO 878	11.4	6.5	15.5	7.6	5.7
OIN-574 X OIN-580	9.6	9.3	13.8	8.4	5.4
OIN-574 X JRO 620	8.1	9.6	13.1	9.2	6.0
OIN-574 X OIJ-267	12.1	6.1	12.6	8.9	6.8
OIN-574 X JRO 128	11.0	5.5	20.0	9.3	2.9
OIN-574 X JRO 878	13.4	6.5	16.3	11.4	3.8
OIN-580 X JRO 620	11.2	6.9	14.8	9.9	3.9
OIN-580 X OIJ-267	2.9	6.6	16.0	9.6	4.2

Parentage	Location				
	Katihar	Rahuri	Coochbehar	Kalyani	Kendrapara
OIN-580 X JRO 128	11.8	7.2	13.8	8.2	3.5
OIN-580 X JRO 878	7.8	6.8	22.1	8.4	3.4
JRO 620 X OIJ-267	7.2	6.5	20.4	7.9	3.4
JRO 620 X JRO 128	8.3	5.8	15.7	8.7	7.8
JRO 620 X JRO 878	10.6	7.8	10.0	8.9	3.5
OIJ-267 X JRO 128	7.7	7.1	13.9	8.9	4.8
OIJ-267 X JRO 878	11.0	5.6	13.5	8.5	7.7
JRO 128 X JRO 878	19.0	6.7	16.4	9.7	7.7
JRO 524+	9.7	6.3	13.9	9.6	7.0
JRO 204+	11.7	9.8	14.4	10.2	11.7

+Check variety

NP(JB)2.3: NHP with *C. olitorius* – Evaluation of F_1 progenies

A total of 43 crosses have been advanced to F_2 generations at Katihar centre. The progenies will be evaluated during 2015 at different test centres. Kalyani and Coochbehar centres did not raised fresh crosses during the year despite their assignment.

NP(JB) 3.1: NHP with *C. capsularis* – New crosses

A total of 22 crosses involving elite lines and selected germplasm accessions have been developed at Katihar centre. The F_1 progenies will be advanced during 2015.

NP(MB) 2.1: NHP with mesta– Evaluation of F_4 progenies of roselle

A total of 150 F_4 progenies of roselle were evaluated at Amadalavalasa centre. Out of these 63 progenies were discarded for low plant height and infection of foot and stem rot disease. A total of 194 plants were selected from the F_4 population. Average plant height and basal diameter of the selected lines were recorded as 351.2±18.2 cm and 1.73±0.25 cm, respectively (figure 1.4).

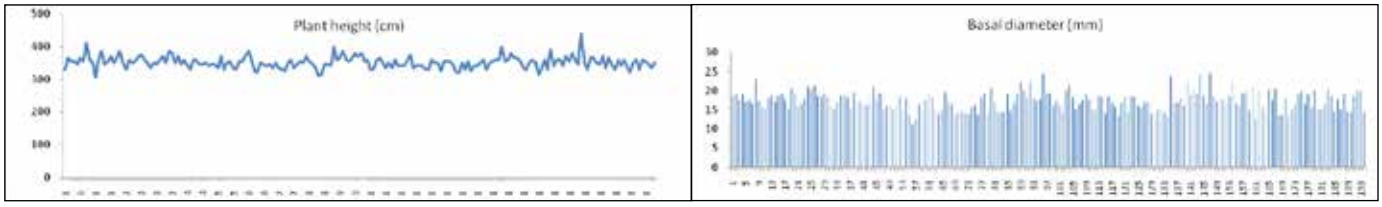


Figure 1.4. Performance of selected F_4 progenies of roselle at Amadalavalasa centre

YIELD EVALUATION TRIALS

Jute

NP(JB)5.14: IET with *tossa* jute *(C. olitorius)*

The trial was constituted with 10 test entries and two check varieties namely, JRO 524 and JRO 8432 and conducted over six locations such as Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara and Nagaon. Location wise results are discussed below and fibre yield data are presented in table 1.6.

Table 1.6: IET with tossa jute (*C. olitorius*) (fibre yield in q/ha)

Entry	Barrackpore	Coochbehar	Kalyani	Katihar	Kendrapara	Nagaon	National Mean
BCCO-10	21.93	33.94	34.10	31.10	19.14	42.32	30.42
BCCO-11	22.11	29.41	36.81	29.32	19.29	40.70	29.61
JROK-17	24.85	31.30	25.93	41.13	20.91	41.37	30.91
JROK-18	25.55	34.31	34.41	39.35	18.75	37.45	31.64
JROK-19	22.30	28.23	24.92	33.87	20.14	37.25	27.79
JROK-20	25.87	31.86	31.33	44.60	17.28	43.46	32.40
NJ-7050	28.50	31.26	28.78	41.67	22.92	50.92	34.01
NOJ-27	27.40	30.57	26.85	23.92	26.54	47.01	30.38
ROJ-14	21.67	34.47	29.17	36.11	27.39	37.08	30.98
UBO-1	23.81	29.35	27.31	34.65	21.06	48.64	30.81
JRO 524+	28.79	31.78	27.85	50.15	30.56	47.77	36.15
JRO 8432+	30.18	29.89	30.17	41.51	21.99	48.69	33.74
G. Mean	25.24	31.36	29.80	37.28	22.16	43.56	31.57
F test	HS	NS	HS	HS	HS	HS	HS
SEm±	1.84	3.17	1.46	3.44	1.49	2.37	0.70
$CD_{(P=0.05)}$	5.22	-	4.14	9.74	4.23	6.71	1.95
CV (%)	17.85	24.76	12.00	22.58	16.51	13.31	18.80

+; Check variety

Barrackpore: At this location sowing was done on 17.04.2014 and harvested on 19.08.2014 after the crop age of 124 days. Differences among all test entries were highly significant. Check variety JRO 8432 (30.18 q/ha) recorded highest fibre yield followed by other check JRO 524 (28.79 q/ha), test entry NJ-7050 (28.50 q/ha) and NOJ-27 (27.40 q/ha). None of the entry was found superior than either of the check.

Coochbehar: The sowing at this location was done on 12.04.2014 and harvested on 20.08.2014 after 131 days of crop age. Differences among entries were statistically not significant. The test entry ROJ-14 with 34.47 q/ha fiber yield was found to be the best performer and closely followed by JROK-18 (34.31 q/ha) and BCCO-10 (33.94 q/ha).

Kalyani: The sowing at this location was done on 17.04.2014 and harvested on 19.08.2014 after 125 days. Differences among entries were statistically highly significant. The test variety BCCO-11 with 36.81 q/ha fibre yield was found the best performer and closely followed by JROK-18 (34.41 q/ha) and BCCO-10 (34.10 q/ha). A total of four entries performed better than both the checks JRO 524 and JRO 8432.

Katihar: The crop was sown on 17.04.2014 and harvested on 20.08.2014 after 126 days crop duration. All test entries were found to be significantly different from each other. Both the checks namely, JRO 524 (50.15 q/ha) and JRO 8432 (41.51 q/ha) outperformed all the entries.

Kendrapara: Sowing of this trial was done on 07.04.2014 and crop was harvested after 166

days on 20.09.2014. There were highly significant differences among entries recorded at this location. Check variety JRO 524 (30.56 q/ha) recorded highest fiber yield followed by test entry ROJ-14 (27.39 q/ha) and NOJ-27 (26.54 q/ha).

Nagaon: Sowing of the trial was done on 04.04.2014 and the crop was harvested after 125 days on 06.08.2014. Entries were significantly different from each other. Test entry NJ-7050 (50.92 q/ha) recorded the highest fiber yield followed by the check variety JRO 524 (48.69 q/ha) and test entry UBO-1 (48.64 q/ha).

National average: Analysis of data at national level revealed that test entries differed significantly. However, check variety JRO 524 turned out to be the best performer and recorded 36.15 q/ha of fibre yield whereas, NJ-7050 stood second (34.01 q/ha) and closely followed by another check variety JRO 8432 (33.74 q/ha).

NP (JB) 5.15: AVT-I with *tossa* jute *(C. olitorius* L.)

A total of five test entries with two checks namely, JRO 524 and JRO 8432 were tested for fibre yield. The trial was conducted over seven locations namely, Barrackpore, Coochbehar, Kalyani, Katihar, Nagaon, Rahuri and Kendrapara. Location wise results are discussed below and fibre yield data are presented in table 1.7.

Table 1.7: AVT-I with tossa jute (*C. olitorius*) (fibre yield in q/ha)

Entry	Barrackpore	Coochbehar	Kalyani	Katihar	Nagaon	Rahuri	Kendrapara*	National Mean
BCCO-8	21.80	31.01	30.39	21.53	22.41	21.98	17.44	24.85
NJ-7005	29.03	42.82	26.83	24.35	28.24	21.99	21.62	28.87
NJ-7010	26.80	33.58	24.34	23.18	30.65	28.26	28.57	27.80
JROK-15	25.45	37.42	29.80	23.91	23.67	25.99	21.14	27.71
JROK-14	27.42	38.01	25.28	23.92	25.19	26.26	22.37	27.68
JRO 524+	27.23	36.97	26.71	27.48	23.53	28.03	15.41	28.33
JRO 8432+	29.34	39.10	27.90	34.53	26.58	30.72	0.00	31.36
G. Mean	26.72	36.99	27.32	25.56	25.75	26.18	21.09	28.09
F test	HS	Sig.	HS	HS	HS	HS	HS	HS
SEm±	1.19	2.33	0.77	0.93	0.82	0.81	1.88	0.39
$CD_{(P=0.05)}$	3.52	6.92	2.30	2.74	2.43	2.41	5.66	1.09
CV (%)	8.87	12.59	5.66	7.23	6.36	6.20	17.81	9.01

+; check varieties, *; Data not included in pooled analysis

Barrackpore: At this location sowing was done on 16.04.2014 and harvested on 20.08.2014 after the crop age of 126 days. Differences among all test entries were highly significant. Check variety JRO 8432(30.18 q/ha) recorded highest fiber yield followed by another check JRO 524 (28.79 q/ha), test entry NJ 7005 (29.03 q/ha) and JROK-14(27.42 q/ha). None of the entry found superior than either of the check.

Coochbehar: The sowing at this location was done on 19.04.2014 and harvested on 20.08.2014 after 124 days. Differences among entries were statistically significant. The test entry NJ-7005 with 42.82 q/ha yield of fiber was found to be the best performer followed by check variety JRO 8432 (39.10 q/ha) and test entry JROK-14 (38.01 q/ha).

Kalyani: The sowing at this location was done on 11.04.2014 and harvested on 11.08.2014 after 123 days. Differences among entries were highly significant. The test entry BCCO-8 with 30.39 q/ha fibre yield was found to be the best performer closely followed by JROK-15 (29.80 q/ha) and check variety JRO 8432 (27.90 q/ha).

Katihar: The crop was sown on 18.04.2014 and harvested on 22.08.2014 after 127 days of crop duration. All test entries were found to be significantly different from each other. Both the check varieties, JRO 8432 (34.53 q/ha) and JRO 524 (27.48 q/ha) outperformed all test entries at this location.

AVT-I *olitorius* trial at Katihar

Nagaon: Sowing of the trial was done on 17.04.2014 and the crop was harvested after 120 days on 14.08.2014. Entries were highly significantly from each other. Test entry NJ-7010 (30.65 q/ha) recorded the highest fiber yield followed by NJ-7005 (28.24 q/ha) and check variety JRO 8432 (26.58 q/ha).

Rahuri: The crop was sown on 16.06.2014 and harvested on 09.10.2014 after 115 days crop duration. All test entries were found to be highly significant from each other. Check variety JRO 8432 (30.72 q/ha) outperformed all test entries at this location. Test entry NJ-7010 recorded 28.26 q/ha fiber yield closely followed by check variety JRO 524 (28.03 q/ha).

Kendrapara: Sowing of this trial was done on 29.03.2014 and crop was harvested after 145 days on 21.08.2014. There were highly significant differences among entries. Test entry NJ-7010 (28.57 q/ha) recorded highest fiber yield followed by JROK-14 (22.37 q/ha) and NJ-7005 (21.62 q/ha). Data was not included in pool analysis due to lack of germination of one check variety at this station.

National average:Analysis of data across locations revealed that differences among test entries were highly significant. However, check variety JRO 8432 turned out to be the best performer and recorded 31.36 q/ha fibre yield followed by NJ-7005 (28.87 q/ha) and another check variety JRO 524 (28.33 q/ha).

NP (JB) 5.16: AVT-II with *tossa* jute *(C. olitorius* L.*)*

This trial was conducted using five test entries with two checks *viz.*, JRO 524 and JRO 8432. The crop was sown over seven locations namely, Barrackpore, Coochbehar, Kalyani, Katihar, Nagaon, Rahuri and Kendrapara to test their yield performance.Location wise results are discussed below and fibre yield data are presented in table 1.8.

Barrackpore: The trail at the location was sown on 16.04.2014 and harvested on 21.08.2014 at the crop age of 127 days. Significant differences among entries were observed. Check variety JRO 8432 was the best performer with 28.79 q/ha fibre yield followed by test entry KRO-4 (28.09 q/ha) and KRO 5 (27.39 q/ha).

On the basis of mean performance over years, check variety JRO 8432 (29.43 q/ha) found to be the best performer followed by KRO-4 (29.23 q/ha) and KRO-5 (28.72 q/ha).

Coochbehar: The trial was sown at this location on 26.05.2014 and harvested on 25.09.2014 after 123 days. Entries were not significantly different at this location. Test entry JROK-10 yielded the highest (33.12 q/ha) followed by BCCO-6 (32.64 q/ha). JRO 8432 was the superior check and exhibited 32.43 q/ha fibre yield.

Based on mean performance, it revealed that check variety JRO 8432 recorded highest fibre yield (31.99 q/ha) followed by test entry KRO-4 (31.52 q/ha) and JROK-10 (31.04 q/ha).

AVT-II *olitorius* trial at Coochbehar

Kalyani: Sowing of the trial was done on 11.04.2014 and after 125 days of field duration it was harvested on 13.08.2014. Test entry BCCO-6 produced the highest quantum of fibre (31.93 q/ha) followed by check variety JRO 524 (30.15 q/ha) and test entry JROK-10 (29.56 q/ha). Differences among entries were highly significant at this location.

Mean performance of entries revealed that BCCO-6 (31.16 q/ha) was the best performer at this location followed by check variety JRO 524 (29.80 q/ha). With 28.61 q/ha fibre yield test entry JROK-10 recorded third highest fibre yielding entry.

Katihar: Crop sowing was done on 19.04.2014 and after 126 days crop age it was harvested on 22.08.2014. Differences among all entries were highly significant. Test entry KRO-4 found to be the top performer (31.68 q/ha) followed by BCCO-6 (28.86 q/ha) and check variety JRO 8432 (28.79 q/ha).

Considering mean performance over years, KRO-4 (28.01 q/ha) and BCCO-6 (26.66 q/ha) were found to be better than the best check variety JRO 8432 (26.63 q/ha).

Nagaon: The trial was sown on 11.04.2014 and harvested on 08.08.2014 after 120 days at this location. No significant difference was observed among entries. However, test entry BCCO-6 was highest fibre yielder followed by JRO-2011-2 (22.80 q/ha). The superior check variety JRO 8432 recorded 22.27 q/ha fibre yield.

Based on mean performance, test entry JRO-2011-2 recorded highest fibre yield (25.44 q/ha) followed by BCCO-6 (24.94 q/ha) and KRO-5 (24.83 q/ha).

Rahuri: The trial was sown on 18.06.2014 and after 115 days crop duration harvested on 10.10.2014. Test entries were highly significant from each other. Test entry KRO-5 recorded highest fibre yield (26.83 q/ha) followed by JRO-2011-2 (26.82 q/ha) and KRO-4 (25.61 q/ha).

Test entry JRO-2011-2 recorded highest average yield of 24.22 q/ha followed by KRO-5 (23.79 q/ha) and JROK-10 (23.49 q/ha).

Kendrapara: The trial was sown at this center on 29.03.2014 and after 146 days of field duration it was harvested on 22.08.2014. Highly significant difference among entries was observed. One of the check varieties namely, JRO 8432 did not germinate. Among five test entries KRO-5 (26.93 q/ha) and JROK-10 (21.57 q/ha) found to be superior to check variety JRO 524 (19.27 q/ha).

Mean performances of entries revealed that test entry KRO-5 (30.10 q/ha) was superior to check variety JRO 524 (29.25 q/ha).

National average: Considering the national average performance for 2014, highly significant differences among entries were recorded. Test entry BCCO-6 recorded highest fibre yield (27.43 q/ha) followed by KRO-4 (26.96 q/ha). Check variety JRO 8432 recorded 26.86 q/ha fibre yield.

Pooled analysis of average yield over locations and years (grand) revealed that KRO-4 recorded the highest fibre yield (27.73 q/ha) followed by check variety JRO 8432 with fibre yield of 27.09 q/ha.

Table 1.8: Pooled data of AVT-I (2013) and AVT-II (2014) with *tossa* jute *C. olitorius* (fibre yield in q/ha)

Entry	Barrackpore			Coochbehar			Kalyani			Katihar			Nagaon			Rahuri			Kendrapara			National Mean		
	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014*	Mean	2013	2014	Mean
JROK-10	29.11	25.83	27.47	28.95	33.12	31.04	27.66	29.56	28.61	22.44	26.23	24.34	25.26	21.27	23.27	23.28	23.70	23.49	25.24	21.57	23.41	25.99	26.62	26.28
KRO-4	30.36	28.09	29.23	32.63	30.41	31.52	31.10	24.93	28.02	24.34	31.68	28.01	23.3	21.06	22.18	21.18	25.61	23.40	35.77	18.37	27.07	28.38	26.96	27.73
KRO-5	30.05	27.39	28.72	19.92	27.54	23.73	28.37	28.37	28.37	22.32	28.68	25.50	28.05	21.60	24.83	20.74	26.83	23.79	33.27	26.93	30.10	26.10	26.73	26.39
JRO-2011-2	26.69	24.66	25.68	22.42	32.21	27.32	26.83	26.12	26.48	22.56	27.55	25.06	28.08	22.80	25.44	21.61	26.82	24.22	23.64	14.94	19.29	24.54	26.69	25.54
BCCO-6	27.44	25.82	26.63	22.55	32.64	27.60	30.39	31.93	31.16	24.46	28.86	26.66	26.86	23.02	24.94	18.13	22.29	20.21	23.7	16.24	19.97	24.79	27.43	26.01
JRO 524+	30.10	25.87	27.99	19.55	32.05	25.80	29.44	30.15	29.80	23.15	25.71	24.43	23.78	21.93	22.86	22.11	23.72	22.92	25.75	19.27	22.51	24.84	26.57	25.64
JRO 8432+	30.07	28.79	29.43	31.55	32.43	31.99	28.49	27.30	27.90	24.46	28.79	26.63	23.33	22.27	22.80	23.84	21.60	22.72	29.25	0.00	29.25	27.28	26.86	27.09
G. Mean	29.11	26.64	27.88	25.37	31.48	28.43	28.9	28.34	28.62	23.39	28.22	25.81	25.52	21.99	23.76	21.55	24.37	22.96	28.09	19.55	23.82	25.99	26.84	26.38
F test	NS	Sig.		HS	NS		NS	HS		NS	HS		HS	NS		NS	HS		HS	HS		NS	HS	SIG.
SEm±	1.12	0.92		2.19	2.02		1.2	0.57		0.9	0.69		0.88	0.82		1.41	0.78		1.57	1.38		0.53	0.33	0.87
$CD_{(P=0.05)}$	-	2.73		6.49	5.99		-	1.70		-	2.05		2.63	2.44		-	2.32		4.67	4.16		-	0.93	2.42
CV %	7.72	6.89		17.23	12.81		8.32	4.04		7.72	4.90		6.92	7.47		13.05	6.41		11.18	14.13		10.7	8.05	9.35

NP(JB) 5.17: IET with white jute(*C. capsularis* L.)

This trial was constituted with eight test entries including two check varieties namely, JRC 517 and JRC 698 and conducted over seven locations such as Bahraich, Barrackpore, Coochbehar, Kalyani, Katihar, Nagaon and Kendrapara. Location wise results were discussed below and fibre yield data are presented in table 1.9. From pooled analysis Kendrapara was excluded, as one test entry did not germinate.

IET capsularis trial at Bahraich

Bahraich: Sowing was done at this location on 11.04.2014 and after 128 days of field duration, harvesting was done on 16.08.2014. Significant differences among entries were observed. Test entry NDJC-2014 (28.40 q/ha) and JRCJ-7 (26.23 q/ha) showed the highest fibre yield than the best check variety JRC 698 (25.93 q/ha).

Barrackpore: The crop was sown on 16.04.2014 at this centre and harvested on 18.08.2014 after 125 days of field duration. There was no significant difference among entries. However, test entry NCJ 07-22 was found to be highest yielder (26.26 q/ha) followed by BCCC-4 (26.10 q/ha) and the best check JRC 698 yielded 24.63 q/ha.

IET *capsularis* trial at Kalyani

Coochbehar: At this location the trial was sown on 12.04.2014 and harvested on 20.08.2014 after 131 days of crop duration. No significant differences among entries were revealed. However, check variety JRC 698 was found to be highest yielder (39.11 q/ha) followed by JRCJ-6 (38.06 q/ha), JRCJ-7 (35.05 q/ha) and BCCC-4 (35.02 q/ha).

Kalyani: Sowing was done at this location on 07.04.2014 and after 122 days of field duration, harvesting was done on 07.08.2014. Highly significant differences among entries were revealed. Test entry BCCC-4 (33.49 q/ha) showed higher fibre yield than the best check JRC 698 (29.4 q/ha) followed by JRCJ-7 (32.56 q/ha) and BCCC-5 (32.25 q/ha) of fibre yield.

IET *capsularis* trial at Katihar

Katihar: Sowing at this location was done on 17.04.2014 and the crop was harvested on 20.08.2014 after 126 days of crop duration. Highly significant differences among entries were observed. Test entry BCCC-5 (35.88 q/ha) was found to be best performer followed by check variety JRC 698 (35.26 q/ha) and test entry NCJ 07-22 (35.11 q/ha) which were at par for fibre yield.

Nagaon: The trial was sown on 07.04.2014

at this centre and harvested on 04.08.2014 when the crop was 120 days old. Highly significant differences among entries were observed. The best performing test entry NCJ 07-22 recorded 47.79 q/ha fibre yield followed by BCCC-4 (45.22 q/ha) and JRCJ-7 (42.61 q/ha). The superior check JRC 698 yielded 42.10 q/ha.

Kendrapara: At this location the trial was sown on 30.03.2014 and harvested on 19.09.2014 after 142 days of duration. Highly significant differences among entries were revealed. The best performing check variety JRC 517 was found to be highest yielder (29.48 q/ha) followed by test entries BCCC-5 (25.93 q/ha) and BCCC-4 (24.85 q/ha) for fibre yield.

National average: While considering national average performance it was revealed that test entry BCCC-4 turned to be the best performer with fibre yield of 32.76 q/ha. Check variety JRC 698 ranked second (32.74 q/ha) followed by NDJC 07-22 (32.46 q/ha) and JRCJ-7 (30.62 q/ha). Highly significant differences were recorded among the entries. Fibre yield data of Kendrapara was not included in pool analysis as one of the test entries did not germinate.

Table 1.9: IET with white jute (*C. capsularis*) (fibre yield in q/ha)

Entry	Bahraich	Barrack-pore	Cooch-behar	Kalyani	Katihar	Nagaon	Kendra para*	National Mean
BCCC-4	24.69	26.10	35.02	33.49	32.02	45.22	24.85	32.76
BCCC-5	22.69	19.90	30.70	32.25	35.88	35.24	25.93	29.44
JRC J-7	26.23	20.86	35.05	32.56	26.39	42.61	18.52	30.62
JRCJ-6	25.77	20.06	38.06	27.16	24.00	26.70	19.83	26.96
NCJ 07-22	21.57	26.26	33.31	30.71	35.11	47.79	22.84	32.46
NDJC-2014	28.40	20.04	32.45	25.08	32.56	32.56	0.00	28.52
JRC 517+	24.81	20.54	34.49	27.93	29.01	36.09	29.48	28.81
JRC 698+	25.93	24.63	39.11	29.40	35.26	42.10	19.75	32.74
G. Mean	25.01	22.30	34.77	29.82	31.28	38.54	23.03	30.29
F test	S	NS	NS	HS	HS	HS	HS	HS
SEm±	1.30	2.11	2.04	1.27	2.20	1.80	1.87	0.65
$LSD_{(P=0.05)}$	3.74	-	-	3.66	6.31	5.16	5.39	1.80
CV (%)	12.77	23.15	14.34	10.46	17.22	11.43	19.85	14.76

+; check varieties, *; Data not included in pooled analysis

NP(JB)5.18: AVT-I with white jute(*C. capsularis* L.)

The trial was comprised of four test entries and two check varieties JRC 698 and JRC 517. It was conducted over seven locations such as Bahraich, Barrackpore, Coochbehar, Kalyani, Katihar, Nagaon and Kendrapara. Location wise results are discussed below and fibre yield data are presented in table 1.10.Kendraparacentre was excluded from pooled analysis as one test entry did not germinate.

Bahraich: The trial at this centre was sown on 10.04.2014 and harvested on 14.08.2014 after 126 days of crop growth. Highly significant differences among entries were revealed. Highest fibre yield was recorded by test entry NDJC-2013 (29.00 q/ha) and superior to best check JRC 517 (27.01 q/ha) followed by BCCC-3 (26.41 q/ha) being at par.

Barrackpore: At this centre trial was sown on 17.04.2014 and after 125 days of crop growth it was harvested on 20.08.2014. Highly significant differences among entries were revealed. Highest fibre yield was recorded by check variety JRC 517 (13.62 q/ha) followed by test entry NCJ-28-1-1 (13.10 q/ha) and JRC 698 (12.15 q/ha). Average performance of all entries, in general was very low at this centre.

Coochbehar: The trial was sown on 12.04.2014 and harvested on 21.08.2014 at the crop age of 131 days. There was no significant difference among entries. However, check variety JRC 517 was found to be highest yielder (32.12 q/ha) followed by JRCJ-5 (31.97 q/ha) and BCCC-3 (30.45 q/ha).

AVT-I *capsularis* trial at Kalyani

Kalyani: The Trial was sown on 05.04.2014 and harvested on 05.08.2014 when the crop was 122 days old. Highly significant differences among entries were revealed. Among the test entries, highest fibre yield was recorded by BCCC-3 (27.42 q/ha) followed by NCJ-28-1-1 (25.17 q/ha) and best check variety JRC 517 (22.67 q/ha) being at par.

Katihar: The sowing at this location was done on 16.04.2014 and harvested on 18.08.2014 after 125 days of crop growth. Highly significant differences among entries were found. The highest fibre yield was produced by BCCC-3 (31.62 q/ha) followed by NCJ-28-1-1 (30.05 q/ha) which were at par with both check varieties JRC 698 (28.53 q/ha) and JRC 517 (28.25 q/ha).

Nagaon: At this location the trial was sown on 09.04.2014 and harvested on 06.08.2014 at crop age of 119 days. Highly significant differences among entries were revealed. Test entry NCJ-28-1-1 turned out to be the best performing entry with 30.55 q/ha fibre yield followed by check varieties JRC 517 (26.20 q/ha) and JRC 698 (25.92 q/ha).

Kendrapara: At this location the trial was sown on 06.04.2014 and harvested on 12.09.2014 after 159 days of duration. Highly significant differences among entries were observed. The best performing test entry BCCC-3 recorded 26.77 q/ha fibre yield which was followed by check variety JRC 698 (25.43 q/ha) and NCJ-28-1-1 with 23.13 q/ha fibre yield.

National average: At national level highly significant variation among entries was observed. Among the test entries BCCC-3 (25.35 q/ha) recorded highest fibre yield followed by NCJ-28-1-1 (25.23 q/ha) which were at par with the best check JCR 517 (24.98 q/ha). Fibre yield data of Kendrapara centre was not included in pooled analysis as one of the test entry did not germinate.

Table 1.10: AVT-I with white jute (*C. capsularis*) (fibre yield in q/ha)

Entry	Bahraich	Barrackpore	Coochbehar	Kalyani	Katihar	Nagaon	Kendrapara*	National Mean
BCCC-3	26.41	11.07	30.45	27.42	31.62	25.14	26.77	25.35
JRCJ-5	24.20	10.10	31.97	24.34	27.90	24.45	16.40	23.83
NCJ- 28-1-1	23.27	13.10	29.25	25.17	30.05	30.55	23.13	25.23
NDJC-2013	29.00	6.30	30.28	21.37	20.07	22.86	-	21.65
JRC 517 +	27.01	13.62	32.12	22.67	28.25	26.20	17.09	24.98
JRC 698+	23.98	12.15	28.89	22.55	28.53	25.92	25.43	23.67

Entry	Bahraich	Barrackpore	Coochbehar	Kalyani	Katihar	Nagaon	Kendrapara*	National Mean
G. Mean	25.64	11.06	30.49	23.92	27.74	25.85	21.76	24.12
F test	HS	HS	NS	HS	HS	HS	HS	HS
SEm±	0.57	0.83	3.59	0.76	1.29	0.86	1.11	0.56
$LSD_{(P=0.05)}$	1.73	2.50	-	2.29	3.87	2.58	3.42	1.57
CV (%)	4.47	14.99	23.51	6.36	9.26	6.61	10.20	13.89

+; check varieties, *; Data not included in pooled analysis

NP(JB)5.19: AVT-II with white jute (*C. capsularis* L.)

The trial was constituted with four test entries and two check varieties namely, JRC 321 and JRC 698. It was conducted on seven locations such as Kalyani, Nagaon, Coochbehar, Kendrapara, Katihar, Barrackpore, Bahraich, and. Location wise results are discussed below and fibre yield data are presented in table 1.11.

Kalyani: The trial was sown on 05.04.2014 and harvested on 06.08.2014 at the crop age of 123 days. Highly significant difference among entries was observed. Test entry BCCC-2 (28.02 q/ha) recorded significantly high fibre yield followed by JRCJ 3 (26.59 q/ha) which was at par with the best check variety JRC 698 (25.52 q/ha).

Average performance of entries over years showed that test variety BCCC-2 (28.73 q/ha) was the highest yielder followed by JRCJ-3 (26.12 q/ha) and NCJ 28-14 (24.40 q/ha). JRC 321 (24.99 q/ha) was found to be superior check.

Nagaon: Sowing at this location was done on 08.04.2014 and after 119 days of field duration harvesting was done on 05.08.2014. Highly significant difference among entries was observed. Test entry JRCJ-3 ranked first with fibre yield of 30.93 q/ha followed by NCJ 28-14 (29.86 q/ha), BCCC-2 (28.83 q/ha) and check variety JRC 698 (28.26 q/ha).

Mean performance over years revealed that test entry JRCJ-3 (29.06 q/ha) exhibited highest fibre yield followed by BCCC-2 (25.49 q/ha) and NCJ 28-14 (25.11 q/ha). Check variety JRC 698 (23.60 q/ha) was found to be better check at this location.

Coochbehar: The trial was sown at this location on 19.04.2014 and harvested on 21.08.2014 after 124 days of crop duration. No significant differences among entries were observed. However, test entry BCCC-2 being the best performer recorded 36.69 q/ha fibre yield followed by NCJ 28-14 (35.83 q/ha). JRC 321 was the superior check and exhibited 34.94 q/ha fibre yield.

Based on mean performance over years test entry BCCC-2 (33.82 q/ha) recorded the highest fibre yield followed by NCJ 28-14 (33.28 q/ha). JRC 698 (32.89 q/ha) was the better check variety at this location.

Kendrapara: The trial was sown at this location on 07.04.2014 and harvested on 15.09.2014 after 161 days. Significant differences among entries were observed. Test entry JRCJ-4 was the highest performer with 25.93 q/ha fibre yield followed by NCJ 28-14 (24.58 q/ha) and the superior check JRC 321 yielded 21.25 q/ha.

Based on mean performance it revealed that NCJ 28-14 (29.90 q/ha) recorded the highest fibre yield followed by JRCJ-4 (26.96 q/ha) and JRCJ-3 (26.18 q/ha). JRC 698 (24.49 q/ha) was the superior check variety at this centre.

Katihar: At this centre sowing was done on 16.04.2014 and after 123 days the crop was harvested on 17.08.2014. Highly significant differences among entries were observed. Check

varieties JRC 321 (31.02 q/ha) and JRC 698 (27.03 q/ha) recorded highest fibre yield and no test entry recorded at par fibre yield with the best check variety JRC 321.

Considering mean performance over years, check entry JRC 321 (25.01 q/ha) was the top performer followed by JRC 698 (22.82 q/ha), NCJ 28-14 (21.70 q/ha) and BCCC-2 (21.49 q/ha).

Barrackpore: The trial at this location was sown on 22.04.2014 and harvested on 24.08.2014 at the crop age of 124 days. Significant differences among varieties were observed. Test entry BCCC-2 was the highest performer with 19.08 q/ha fibre yield followed by NCJ 28-14 (16.48 q/ha) and JRCJ-3 (15.60 q/ha). The superior check JRC 321 yielded 14.91 q/ha.

On the basis of mean performance over years, no significant differences among entries were observed. Test entry BCCC-2 (20.32 q/ha) recorded highest fibre yield followed by NCJ 28-14 (17.44 q/ha) and JRCJ-3 (17.19 q/ha). The superior check JRC 698 yielded 15.70 q/ha fibre yield.

Bahraich: The trial at this centre was sown on 10.04.2014 and harvested on 15.08.2014 after 127 days of crop growth. Highly significant difference among entries was observed. Check varieties JRC 698 (28.17 q/ha) and JRC 321 (27.27 q/ha) recorded highest fibre yield followed by test entry JRCJ-3 (25.46 q/ha).

Field view of *Capsularis* trials at Bahraich

Based on two years evaluation, check varieties JRC 698 (18.96 q/ha) and JRC 321 (17.65 q/ha) recorded highest fibre yield followed by test entry JRCJ-3 (17.51 q/ha).

National average: In 2013 under AVT I trial no significant differences among entries were observed. However, test entry NCJ 28-14 was best performing entry recorded 25.37 q/ha followed by BCCC-2 (25.11 q/ha) and JRCJ-3 (24.59 q/ha) which were at par with superior check JRC 698 (23.75 q/ha)

In 2014 under AVT II trial highly significant differences among entries were revealed when compared at national level across test locations. Test entry BCCC-2 yielded 26.03 q/ha fibre yield being top performer followed by superior check JRC 321 (25.25 q/ha), JRCJ-3 (24.99 q/ha) and NCJ 28-14 (24.92 q/ha).

Analysis on mean over location and year mean (grand mean) suggested that no significant difference was there among entries. However, test entry BCCC-2 (25.57 q/ha) was the best among all test entries followed by NCJ 28-14 (25.15 q/ha) and JRCJ 3 (24.79 q/ha). JRC 698 emerged as the superior check with fibre yield of 24.34 q/ha.

Table 1.11: Pooled data of AVT-I (2013) and AVT-II (2014) with *C. capsularis* (fibre yield in q/ha)

Entry	Kalyani			Nagaon			Coochbehar			Kendrapara			Katihar			Barrackpore			Bahraich			National		
	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013*	2014	Mean	2013	2014	Mean
BCCC-2	29.44	28.02	28.73	22.14	28.83	25.49	30.95	36.69	33.82	27.89	23.17	25.53	18.70	24.28	21.49	21.56	19.08	20.32	6.05	22.12	14.09	25.11	26.03	25.57
JRC J-4	22.79	21.13	21.96	24.39	24.95	24.67	25.77	32.46	29.12	27.99	25.93	26.96	18.88	19.73	19.31	17.62	13.51	15.57	7.01	21.31	14.16	22.91	22.72	22.82
JRC J-3	25.64	26.59	26.12	27.19	30.93	29.06	26.86	32.50	29.68	29.28	23.07	26.18	19.82	20.77	20.30	18.78	15.60	17.19	9.56	25.46	17.51	24.59	24.99	24.79
NCJ 28-14	27.90	20.89	24.40	20.36	29.86	25.11	30.73	35.83	33.28	35.22	24.58	29.90	19.59	23.81	21.70	18.4	16.48	17.44	8.54	22.95	15.75	25.37	24.92	25.15
JRC 321+	26.36	23.62	24.99	18.46	23.71	21.09	29.21	34.94	32.08	26.11	21.25	23.68	18.99	31.02	25.01	15.4	14.91	15.16	8.02	27.27	17.65	22.42	25.25	23.84
JRC 698+	24.34	25.52	24.93	18.93	28.26	23.60	33.03	32.74	32.89	30.39	18.58	24.49	18.61	27.03	22.82	17.2	14.20	15.70	9.74	28.17	18.96	23.75	24.93	24.34
G. Mean	26.08	24.30	25.19	21.91	27.76	24.84	29.42	34.19	31.81	29.48	22.76	26.12	19.1	24.44	21.77	18.16	15.63	16.90	8.15	24.54	16.35	24.02	24.67	24.34
F test	Sig.	HS		HS	HS		NS	NS		Sig.	Sig.		NS	HS		HS	Sig.		HS	HS		NS	HS	NS
SEm±	0.95	0.62		0.73	1.38		1.88	2.91		1.63	1.39		0.65	0.98		0.89	1.13		0.42	0.42		0.50	0.45	0.93
$CD_{(P=0.05)}$	2.87	1.88		2.21	4.16		-	-		4.92	4.17		-	2.97		2.68	3.40		1.28	1.27		-	1.27	-
CV %	7.31	5.13		6.69	9.95		12.77	17.02		11.07	12.16		6.83	8.06		9.78	14.44		10.4	3.43		10.11	11.86	11.28

+: check variety; *: Data not included in pooled analysis due to exceptionally low yield

Mesta

NP(SB)12.60:IET with roselle (*H. sabdariffa*)

The trial was constituted with six test entries and two check varieties namely, AMV 5 and HS 4288 and conducted over seven locations such as Aduthurai, Amadalavalasa, Barrackpore, Coochbehar, Katihar, Kendrapara and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.12.

Table 1.12: IET withroselle (*H. sabdariffa*) (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Barrackpore	Coochbehar	Katihar	Kendrapara	Rahuri	National Mean
AHS-267	31.60	17.98	19.61	28.72	32.87	28.16	22.69	25.95
AHS-255	32.02	21.53	24.65	24.48	27.08	31.40	17.44	25.51
AHS-264	25.69	22.84	17.36	22.57	35.57	30.09	17.75	24.55
JRR-2013-1	25.73	21.76	25.07	24.53	26.39	26.16	21.14	24.40
JRHS-2	36.73	27.47	14.14	23.70	33.18	37.81	19.37	27.49
JRHS-1	30.40	30.40	24.68	22.49	35.88	28.01	19.14	27.29
AMV 5+	29.94	22.84	25.34	27.40	25.15	32.48	17.36	25.79
HS 4288+	24.73	23.84	23.77	25.16	27.08	34.72	16.74	25.15
G. Mean	29.61	23.58	21.83	24.88	30.40	31.11	18.95	25.77
F test	HS	HS	HS	NS	HS	HS	HS	HS
SEm±	1.15	1.71	2.04	1.87	1.95	2.10	0.89	0.57
$CD_{(P=0.05)}$	3.31	4.92	5.87	-	5.61	6.02	2.57	1.58
CV (%)	9.53	17.79	22.96	18.48	15.75	16.52	11.55	16.46

+; check varieties

Aduthurai: The trial was sown on 06.06.2014 and harvested on 02.11.2014 at the age of 149 days. Significant differences were found among test entries at this location. With 36.73 q/ha fibre yield JRHS-2 emerged first followed by AHS-255 and AHS-267 with fibre yield of 32.02 q/ha and 31.60 q/ha, respectively. JRHS-2 (36.73 q/ha) was found significantly superior than best check AMV 5 (29.94 q/ha).

Amadalavalasa: The trial was sown on 06.06.2014 at this center and harvested on 21.11.2014 when the crop was 168 days old. Test entry JRHS-1 recorded the highest yield of 30.40 q/ha followed by JRHS-2 with 27.47 q/ha fibre yield. However, JRHS-1 was found significantly superior than the best check variety HS 4288 (32.84 q/ha).

Barrackpore: At this location sowing was done on 09.05.2014 and harvesting on 29.09.2014 after the crop age of 140 days. AMV 5 with 25.34 q/ha fibre yield was best performer and none of the test entries were significantly superior than the best check AMV 5.

Coochbehar: Sowing of the trial was done on 27.05.2014 and the crop was harvested after 139 days on 13.10.2014. Test entries were not significantly different from each other.

Katihar: The crop was sown on 01.05.2014 and harvested on 11.10.2014 after 164 days crop duration. All test entries were found to be significantly different from each other. JRHS-1 was highest yielder with 35.88 q/ha fibre yield closely followed by AHS-264 with 35.57 q/ha yield. Test entries JRHS-1, AHS-264, JRHS-2 and AHS-267 were significantly superior over the best check HS 4288 (27.08 q/ha).

Kendrapara: Sowing of this trial was done on 01.05.2014 and harvested after 164 days on 11.10.2014. JRHS-2 was highest yielder with 37.81 q/ha fibre yield followed by check variety HS 4288 with 34.72 q/ha yield.

Rahuri: The sowing at this location was done on 15.06.2014 and harvested on 02.11.2014 after 140 days of sowing. Test entry AHS-267 with 22.69 q/ha yield was found to be significantly superior than the best check AMV 5 whose yield was 17.36 q/ha.

National average:Analysis of data at national level revealed that entries were significantly different among themselves. Test entries JRHS-2 (27.79 q/ha) and JRHS-1 (27.29 q/ha) turned out to be significantly superior over the best check AMV 5 (25.79 q/ha).

NP (SB) 12.61: AVT-I with roselle *H. sabdariffa*

A total of four test entries with two checks namely, AMV 5 and HS 4288 were tested for fibre yield. The trial was conducted over seven locations *viz.*, Aduthurai, Amadalavalsa, Barrackpore, Coochbehar, Katihar, Kendrapara and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.13.

Aduthurai: The trial at this location was sown on 06.06.2014 and harvested on 03.11.2014 after 150 days. There were no significant differences among test varieties at this location and average fibre yield in general, was low for all the entries under evaluation.

Amadalavalasa: The crop was sown on 05.06.2014 and harvested on 19.11.2014 after 167 days. With fibre yield of 28.47 q/ha, AHS-249 was significantly superior over the best check variety HS 4288 (21.90 q/ha).

Barrackpore: The sowing was done on 08.05.2014 and crop was harvested at the age of 139 days on 27.09.2014. JRR-2012-1 with 21.51 q/ha was top performer but it was statistically at par with the best check AMV 5 which recorded 19.43 q/ha fibre yield.

Coochbehar: Sowing of the trial was done on 15.05.2014 and the crop was harvested after 137 days on 30.09.2014. Test entries were not significantly different from each other at this location.

Katihar: Sowing at this location was done on 03.06.2014 and crop was harvested after 132 days of crop duration on 13.10.2014. Test entry AHS 249 with 27.09 q/ha fibre yield was top performer followed by JRR-2012-1 (26.04 q/ha). Both the entries were significantly superior over the best check HS 4288 which yielded 22.64 q/ha fibre yield.

AVT-I roselle trial at Coochbehar

Table 1.13: AVT-I with roselle (*H. sabdariffa*) (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Barrackpore	Coochbehar	Katihar	Kendrapara	Rahuri	National Mean
AHS-238	16.61	21.20	18.06	28.69	23.47	27.54	14.54	21.44
AHS-249	15.98	28.47	21.11	31.40	27.09	32.29	17.04	24.77
AHS-254	17.13	14.98	14.13	28.66	9.71	22.79	20.67	18.30
JRR-2012-1	16.42	20.56	21.51	25.12	26.04	30.65	23.91	23.46
AMV 5+	16.64	18.84	19.43	30.33	20.32	35.16	18.84	22.79
HS 4288+	15.40	21.90	17.69	26.46	22.64	36.32	16.01	22.35
G. Mean	16.36	20.99	18.65	28.44	21.55	30.79	18.51	22.18
F test	NS	HS	HS	NS	HS	HS	HS	HS
SEm±	0.37	1.96	0.94	1.80	1.18	1.90	0.93	0.44
$CD_{(P=0.05)}$	-	5.91	2.83	-	3.55	5.72	2.82	1.22
CV (%)	4.53	18.67	10.07	12.69	10.93	12.32	10.11	12.74

+; check varieties

Kendrapara: The sowing date of the trial at this center was 07.05.2014 and after 173 days of crop age harvested on 27.10.2014. Both checks were top performer at this location.

Rahuri: This trial was sown on 16.06.2014 and after 139 days of crop duration it was harvested on 02.11.2014. Test entries were significantly different from each other. JRR-2012-1 with 23.91 q/ha fibre yield emerged as highest yielder followed by AHS-254 (20.67 q/ha). JRR-2012-1 was found significantly superior over the best check variety AMV 5 which reported 18.84 q/ha fibre yield.

National average: The test entry AHS-49 was found to be the best performer with 24.77 q/ha average fibre yield. This was followed by JRR-2012-1 which recorded 23.46 q/ha fibre yield.

NP(SB)12.62: AVT-II with roselle (*H. sabdariffa*)

This trial was conducted using three test entries with two checks *viz*., AMV 5 and HS 4288. The trial was conducted over seven locations namely, Amadalavasa, Barrackpore, Coochbehar, Katihar, Kendrapara, Rahuri and Aduthurai to test their yield performance but Aduthurai centre did not report the data. Location wise results are discussed below and fibre yield data are presented in table 1.14.

Hudhud affected AVT-II roselle trial at Amadalavalasa

Amadalavalasa: The trial was sown at this location on 06.06.2014 and harvested on 20.11.2014 after 167 days. The differences among test entries were highly significant. Test entry JRR-2011-1 turned out to be the best performer with fibre yield of 28.50 q/ha

followed by AHS-233 (26.09 q/ha).

In terms of mean performance JRR-2011-1 ranked first with 35.73 q/ha fibre yield followed by AHS-230 whose yield was 34.67 q/ha.

Barrackpore: Crop sowing was done on 08.05.2014 and harvesting was carried out on 27.09.2014 after a period of 139 days. All test entries were not significantly different from each other. None of the entries was superior than the best check HS 4288 (20.13 q/ha).

In terms of mean performance, AHS-230 recorded highest fibre yield (19.66 q/ha).

Coochbehar: Sowing at this location was done on16.05.2014 and crop was harvested on 02.10.2014 after 139 days of crop duration. Entries were not significantly different from each other at this location. However, AHS-230 was top performer with 33.96 q/ha fibre yield.

In terms of mean performance over years, test entry AHS-230 ranked first with 30.25 q/ha fibre yield.

Katihar: Crop sowing was done on 07.05.2014 and after 164 days crop age it was harvested on 19.10.2014. Test entries were significantly different from each other. However, check variety HS 4288 with 30.73 q/ha fibre yield ranked first at this location.

AVT-I roselletrial at Katihar

Kendrapara: At this location sowing and harvesting was done on 07.05.2014 and 19.10.2014 respectively. The crop maturing period was 164 days. All test entries were significantly different from each other in terms of fibre yield. Check variety AMV 5 (32.09 q/ha) was highest fibre yielder.

In terms of mean performance of two years, test entry AHS-233 recorded highest fibre yield of 33.18 q/ha followed by AHS-230 (32.83 q/ha).

Rahuri: The trial was sown on 18.06.2014 and after 137 days crop duration harvested on 02.11-2014. Test entries were significantly different from each other. Test entry AHS-233 (24.68 q/ha) was significantly superior over the best check variety HS 4288 (20.19 q/ha) followed by AHS-230 (23.15 q/ha) which was significantly at par with the best check.

Test entry AHS-230 produced highest mean fibre yield of 23.01 q/ha followed by AHS-233 (22.68 q/ha) over years.

National average: On the basis of national average performance for 2014, significant difference among entries was observed. Test entry AHS-233 recorded the highest fibre yield (25.49 q/ha) followed by AHS-230 (25.42 q/ha).

Considering mean performances over locations and year test entry AHS-230 recorded the highest fibre yield (27.87 q/ha) followed by AHS-233 (25.94 q/ha).

Table1.14 : Pooled data of AVT-I (2013) and AVT-II (2014) withroselle (*H. sabdariffa*) (fibre yield in q/ha)

Entry	Amadalavalasa			Barrackpore			Coochbehar			Katihar	Kendrapara			Rahuri			National		
	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2014	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean
AHS-233	26.91	26.09	26.50	18.07	19.65	18.86	23.99	33.43	28.71	25.47	42.73	23.63	33.18	20.68	24.68	22.68	26.48	25.49	25.94
JRR-2011-1	42.95	28.50	35.73	18.7	19.72	19.21	25.08	30.97	28.03	21.96	22.46	24.43	23.45	20.58	21.31	20.95	25.95	24.48	25.15
AHS-230	44.71	24.63	34.67	19.53	19.78	19.66	26.54	33.96	30.25	25.71	40.39	25.26	32.83	22.86	23.15	23.01	30.8	25.42	27.87
AMV 5+	27.06	15.68	21.37	17.43	19.71	18.57	25.69	27.18	26.44	23.99	25.93	32.09	29.01	19.35	18.48	18.92	23.09	22.86	22.96
HS 4288+	31.98	24.74	28.36	19.03	20.13	19.58	24.57	29.54	27.06	30.73	19.19	26.40	22.80	16.55	20.09	18.32	22.26	25.27	23.90
G. Mean	34.72	23.93	29.33	18.55	19.80	19.18	25.17	31.02	28.10	25.57	30.14	26.36	28.25	20	21.54	20.77	25.72	24.70	25.16
F test	HS	HS		NS	NS		NS	NS		HS	HS	HS		HS	HS		NS	Sig.	NS
SEm±	2.11	2.03		0.71	0.86		1.49	2.48		0.77	1.16	1.25		0.61	0.78		0.67	0.55	1.05
$CD_{(P=0.05)}$	6.49	6.26		-	-		-	-		2.38	3.59	3.86		1.87	2.40		-	1.56	-
CV %	12.14	16.97		7.63	8.61		11.81	16.00		6.03	7.72	9.49		6.08	7.23		11.58	12.26	11.82

+; check varieties, Katihar centre did not report data during 2013 and Aduthurai during both (2013 & 2014) years

NP (CB) 1.32: IET with kenaf (*H. cannabinus*)

The trial was conducted with four test entries and two check varieties namely, HC 583 and AMC 108 over seven locations viz., Aduthurai, Amadalavalasa, Barrackpore, Coochbehar, Katihar, Kendrapara, and Rahuri. Location wise results of seven centres are discussed below and fibre yield data are presented in table 1.15.

Aduthurai: The crop was sown at this location on 05.06.2014 and harvested on 01.10.2014 at the crop age of 118 days. Check variety AMC 108 (41.13 q/ha) performed best at this location followed by test entries JRHC-2 (37.04 q/ha), JRK-2013-1 (35.84 q/ha), JRHC-1 (33.26 q/ha) and JRK-2013-2 (33.14 q/ha) for fibre yield. Differences among entries were highly significant.

Amadalavalasa: The experiment was sown at this location on 12.06.2014 and harvested on 17.10.2014 at 127 days of crop age.Only one test entry namely, JRHC-2 (25.31 q/ha) outperformed the best check variety HC 583 (20.99 q/ha) at this location.Rest entries were inferior to both checks in terms of fibre yield. Entries were significantly different.

IET kenaf trial at Coochbehar

Barrackpore: The crop was sown at SRS, Bamra on 28.06.2014 and harvested on 29.10.2014 at the age of 123 days. Test entries JRHC-1 (39.50 q/ha) and JRHC-2 (38.97 q/ha) outyielded both the check varieties AMC 108 (35.90 q/ha) and HC 583 (29.42 q/ha) at this location.Rest entries were statistically at par with the best check variety AMC 108.

Coochbehar: The trial was sown at this location on 27.05.2014 and harvested on 14.10.2014 at 140 days. Test entries JRHC-2 (37.97 q/ha) and JRK-2013-1 (36.86 q/ha) outperformed the best check variety AMC 108 (34.16 q/ha) followed by HC 583 (33.95 q/ha), JRHC-1 (33.15 q/ha) and JRK-2013-2 (32.55 q/ha). Differences among entries were not statistically significant.

Katihar: The crop was sown at this centre on 05.06.2014 and harvested on 17.10.2014 at 134 days. Test entry JRK-2013-1 (35.88 q/ha) recorded significantly higher fibre yield than the best check variety AMC 108 (27.24 q/ha) at this location. Rest entries were statistically on par with check varieties for fibre yield.

IET kenaf trial at Rahuri

Kendrapara: The trial at this location was sown on 02.05.2014 and harvested on 14.10.2014 when the crop age was 165 days. Test entry JRK-2013-2 (43.36 q/ha) outyielded the best check variety AMC 108 (40.35 q/ha) followed by test entry JRHC-1 (37.73 q/ha) and check variety HC 583 (36.73 q/ha). Differences among entries were highly significant for fibre yield.

Rahuri: The crop was sown at this centre on 15.06.2014 and harvested on 08.10.2014 at 115 days. Test entries JRHC-2 (41.13 q/ha) and JRK-2013-1 (38.43 q/ha) outperformed the best check variety AMC 108 (38.35 q/ha)

followed by JRHC-1 (31.10 q/ha) and JRK-2013-2 (29.40 q/ha) at this location. Difference among the entries was highly significant.

Table 1.15: IET with kenaf (*H. cannabinus*)(fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Barrackpore	Coochbehar	Katihar	Kendrapara	Rahuri	National Mean
JRK-2013-1	35.84	19.14	34.87	36.86	35.88	36.27	38.43	33.90
JRHC-2	37.04	25.31	38.97	37.97	21.22	33.33	41.13	33.57
JRK 2013-2	33.14	20.29	35.64	32.55	24.54	43.36	29.40	31.27
JRHC-1	33.26	18.90	39.50	33.15	24.15	37.73	31.10	31.11
HC 583+	31.64	20.99	29.42	33.95	25.54	36.73	28.86	29.59
AMC 108+	41.13	20.76	35.90	34.16	27.24	40.35	38.35	33.98
G. Mean	35.34	20.90	35.72	34.77	26.43	37.96	34.54	32.24
F test	HS	Sig.	Sig	NS	HS	HS	HS	NS
SEm±	1.45	1.35	2.21	3.10	1.92	1.74	1.92	0.77
$CD_{(P=0.05)}$	4.22	3.93	6.45	-	5.58	5.07	5.60	-
CV (%)	10.04	15.82	15.20	21.83	17.74	11.23	13.65	15.42

+; check varieties

National average: Considering national average performance, the check variety AMC 108 (33.98 q/ha) was found to be the best performer which was very close to the test entry JRK-2013-1 (33.90 q/ha) followed by JRHC-2 (33.57 q/ha) and JRK-2013-2 (31.27 q/ha). Differences among entries was not significant.

NP(CB)1.33: AVT-I with kenaf (*H. cannabinus*)

The trial was conducted with four test entries along with two checks namely, HC 583 and AMC 108 at seven locations namely, Aduthurai, Barrackpore, Coochbehar, Katihar, Kendrapara, Rahuri and Amadalavalasa. Location-wise results are discussed below and fibre yield data are presented in table 1.16.

Aduthurai: The experiment was sown on 05.06.2014 at this location and harvested on 30.09.2014 after 116 days of sowing. Test entry JRK-2011-2 (20.78 q/ha) outperformed the best check variety HC 583 (17.31 q/ha) followed by JRK-2011-4 (17.18 q/ha) and JRK-2011-1 (16.48 q/ha). Differences among entries were highly significant.

Barrackpore: The crop was sown at this location on 28.06.2014 and harvested at the age of 122 days on 28.10.2014. Check variety AMC 108 (23.17 q/ha) performed better at this location followed by test entry JRK-2011-1 (21.47 q/ha) and other check variety HC 583 (20.76 q/ha). Differences among entries for fibre yield were significant.

Coochbehar: The trial was sown in this location on 15.05.2014 and harvested on 03.10.2014 at 141 days. Test entry JRK-2011-1 (37.70 q/ha) outyielded the best check variety AMC 108 (36.87 q/ha) followed by JRK-2011-4 (33.15 q/ha) and JRK-2012-1 (31.24 q/ha).Entries were significantly different for fibre yield.

Katihar: The crop was sown at this centre on 05.06.2014 and harvested on 18.10.2014 at 135 days. Test entry JRK-2011-2 (26.41 q/ha) recorded higher fibre yield than the best check variety AMC 108 (26.22 q/ha) followed by JRK-2011-1 (26.00 q/ha) at this location. Difference among entries was highly significant for fibre yield.

Kendrapara: The crop was sown at this centre on 06.5.2014 and harvested on 14.10.2014 when the crop age was 161 days. Test entries JRK-2011-2 (32.88 q/ha), JRK-2011-1 (30.89 q/ha) and JRK-2011-4 (30.39 q/ha), surpassed both the check varieties HC 583 (29.44 q/ha) and AMC 108 (25.78 q/ha) for fibre yield potential. Entries were not significantly different.

Rahuri: The trial was sown on 15.06.2014 at this location and harvested on 09.10.201 after 116 days. Test entries JRK-2012-1 (31.86 q/ha) and JRK-2011-2 (30.04 q/ha) outperformed the best check variety AMC 108 (26.30 q/ha) for fibre yield at this centre. Differences among entries were highly significant.

AVT-I kenaf trial at Rahuri

Amadalavalasa: The experiment was sown on 12.06.2014 and harvested on 17.10.2014 at this location when the crop age was 127 days. None of the test entries performed better for fibre yield at this location. The average performance of all entries in general, was far below the normal yield. Hence, data not included in pooled analysis.

Table 1.16: AVT-I with kenaf (*H. cannabinus*) (fibre yield in q/ha)

Entry	Aduthurai	Barrackpore	Coochbehar	Katihar	Kendrapara	Rahuri	Amadalavasa*	National Mean
JRK 2011-2	20.78	18.79	29.66	26.41	32.88	30.04	7.35	26.43
JRK 2012-1	13.00	18.63	31.24	22.38	23.81	31.86	12.42	23.49
JRK 2011-4	17.18	19.40	33.15	21.24	30.39	23.54	9.11	24.15
JRK 2011-1	16.48	21.47	37.70	26.00	30.89	22.25	11.23	25.80
HC 583+	17.31	20.76	27.61	22.53	29.44	25.00	12.61	23.78
AMC 108+	16.64	23.17	36.87	26.22	25.78	26.30	13.72	25.83
G. Mean	16.90	20.37	32.71	24.13	28.87	26.50	11.07	24.91
F test	HS	Sig	Sig.	HS	NS	HS	HS	HS
SEm±	0.70	0.96	2.23	1.00	2.14	0.72	1.06	0.48
$CD_{(P=0.05)}$	2.10	2.90	6.74	3.02	6.44	2.18	3.19	1.35
CV (%)	8.26	9.45	13.67	8.30	14.81	5.45	19.11	11.59

+; check variety, *; data not included in pooled analysis due to low fibre yield

National average: Considering average performance of entries over locations, test entry JRK-2011-2 (26.43 q/ha) outperformed the best check variety AMC 108 (25.83 q/ha) for fibre yield followed by JRK-2011-1 (25.80 q/ha) and JRK-2011-4 (24.15 q/ha). Differences among entries were highly significant.

Sunnhemp

NP(SNH-B)1.18: IET with sunnhemp (*C. juncea*)

The trial was conducted with six test entries and two check varieties namely, SH 4 and SUIN

053 over five locations *viz.*Aduthurai, Barrackpore, Budbud, Kalyani and Pratapgarh. Aduthurai centre did not report data due to crop loss by water stagnation in the field. Location wise results are discussed below and fibre yield data are presented in table 1.17.

Aduthurai: The experiment was sown on 11.06.2014 but this centre did not report fibre yield data owing to the crop damage due to water logging at the later stage of crop growth.

Barrackpore: The trial was sown at this centre on 10.05.2014 and harvested on 12.08.2014 when the crop age was 94 days. Two test entries Sanai-12 (12.89 q/ha) and Sanai-11 (11.35 q/ha) performed better than the best check SUIN 053 (11.00 q/ha) followed by JRS-2013-1 (10.35 q/ha) and Sanai-15 (9.91 q/ha). Differences among entries were highly significant.

IET sunnhemp trial at Barrackpore

Budbud: The trial was sown at this location on 15.05.2014 and harvested on 10.08.2014 after 87 days of sowing. All test entries at this location performed better than the best check variety SUIN 053 (10.29 q/ha) except Sanai-15 (9.87 q/ha). The best entry Sanai-14 (11.29 q/ha) was followed by Sanai-12 (10.77 q/ha) and Sanai-11 (10.57 q/ha. Differences among entries were non-significant and highly influence of experimental errors led to high value of coefficient of variation (25.18%) at the location.

Kalyani: The experiment was sown at this location on 23.05.2014 and harvested on 23.08.2014 after 92 days. Two test entries JRS-2013-1 (13.53 q/ha) and Sanai-14 (12.80 q/ha) performed better than the best check variety SH 4(12.40 q/ha) followed by test entries Sanai-11 (12.20 q/ha) and Sanai-15 (12.00 q/ha). Differences among entries were non-significant.

Pratapgargh: The crop was sown at this location on 01.05.2014 and harvested on 14.08.2014 after 106 days. Test entries Sanai-11 (13.37 q/ha), Sanai-13 (13.29 q/ha) and Sanai-15 (12.69 q/ha) performed better than the best check variety SUIN 053 (12.31 q/ha). Differences among entries were highly significant.

Table 1.17: IET with sunnhemp (*C. juncea*) (fibre yield in q/ha)

Entry	Barrackpore	Budbud	Kalyani	Pratapgarh	National Mean
Sanai-11	11.35	10.57	12.20	13.37	11.87
Sanai-14	5.57	11.29	12.80	11.43	10.27
JRS-2013-1	10.35	10.94	13.53	10.89	11.43
Sanai-13	8.81	10.10	11.80	13.29	11.00
Sanai-15	9.91	9.87	12.00	12.69	11.12
Sanai-12	12.89	10.77	11.53	10.67	11.47
SH 4+	7.34	9.95	12.40	11.08	10.19
SUIN 053+	11.00	10.29	11.73	12.31	11.33
G. Mean	9.65	10.47	12.25	11.97	11.09

Entry	Barrackpore	Budbud	Kalyani	Pratapgarh	National Mean
F test	HS	NS	NS	HS	Sig.
SEm±	0.62	1.07	0.65	0.56	0.33
$CD_{(P=0.05)}$	1.77	-	-	1.60	0.91
CV (%)	15.68	25.18	13.02	11.43	16.67

+; check varieties

National average: Considering national average performance over locations, it was found that test entries Sanai-11 (11.87 q/ha), Sanai-12 (11.47 q/ha) and JRS-2013-1 (11.43 q/ha) identified as the better performing entries over both the check varieties SUIN 053 (11.33 q/ha) and SH 4 (10.19 q/ha). Other test entry *viz.* Sanai-15 (11.12 q/ha) was closely at par in terms of yield potential. Differences among entries across locations were significant.

NP(SNH-B)1.19: AVT–I with sunnhemp(*C. juncea*)

The trial was conducted with four promising entries and two check varieties namely, SH 4 and SUIN 053 over five locations namely, Barrackpore, Budbud, Kalyani, Pratapgarh and Aduthurai to assess the performance of high yielding strains of sunnhemp in different agro-climatic regions. Location wise results are discussed below and fibre yield data are presented intable 1.18.

Barrackpore: The crop was sown on 10.05.2014 at this location and harvested on 12.08.2014 at the crop age of 94 days. Only one test entry *viz*., Sanai-9 (8.16 q/ha) performed better than the best check variety SUIN 053 (7.94 q/ha). Differences among the entries were significant.

AVT-I sunnhemp trial at Barrackpore

Budbud: The trial was sown at this location on 02.06.2014 and harvested on 30.08.2014 after 90 days of sowing. Three test entries namely, Sanai-7 (11.51 q/ha), Sanai-10 (10.98 q/ha) and Sanai-6 (10.65 q/ha) performed better than the best check variety SH 4 (10.55 q/ha) followed by Sanai-9 (9.51 q/ha) and SUIN 053 (9.08 q/ha). Differences among entries were not significant.

Kalyani: The trial at this centre was sown on 23.05.2014 and harvested on 23.08.2014 at the crop age of 92 days. Test entries Sanai-10 (10.23 q/ha) and Sanai-6 (9.77 q/ha), performed better than the best check variety SUIN 053 (9.66 q/ha) followed by Sanai-9 (8.98 q/ha) and Sanai-7 (8.75 q/ha). Performances of test entries were not significant.

Pratapgarh: The crop was sown on 03.05.2014 and harvested on 31.07.2014 at the age of 89 days. None of the test entries performed better than the best check variety SH 4 (13.69 q/ha) at this centre. Two test entries namely, Sanai-10 (12.60 q/ha) and Sanai-9 (12.50 q/ha) numerically performed better than the other check variety SUIN 053 (12.31 q/ha). Differences among the entries were highly significant for fibre yield potential.

Aduthurai: The experiment at this location was sown on 11.06.2014 and harvested on 12.08.2014 only after 62 days of sowing. Fibre yield of all the entries was exceptionally low perhaps due to the late sowing or very short crop duration and therefore data neither analysed nor included in pooled analysis.

Table 1.18: AVT-I with Sunnhemp (C. juncea) (fibre yield in q/ha)

Entry	Barrackpore	Budbud	Kalyani	Pratapgarh	Aduthurai*	National Mean
Sanai-6	6.09	10.65	9.77	12.09	1.10	9.65
Sanai-10	6.35	10.98	10.23	12.60	1.25	10.04
Sanai-9	8.16	9.51	8.98	12.50	1.54	9.79
Sanai-7	6.30	11.51	8.75	12.21	1.23	9.69
SH 4+	7.10	10.55	9.32	13.69	1.32	10.17
SUIN 053+	7.94	9.08	9.66	12.31	1.10	9.75
G. Mean	6.99	10.38	9.45	12.57	1.26	9.85
F test	Sig.	NS	NS	HS	-	NS
SEm±	0.48	0.99	0.54	0.16	-	0.25
$CD_{(P=0.05)}$	1.45	-	-	0.46	-	-
CV (%)	13.80	19.14	11.30	2.44	-	12.56

+; check varieties, *; data not analyzed due to exceptionally low yield

National Average: Considering national average over locations, none of the test entries performed better than the best check variety SH 4 (10.17 q/ha). It was followed by test entry Sanai-10 (10.04 q/ha) and Sanai-9 (9.79 q/ha). Entries were not significantly different for their yield potential.

NP(SNH-B)1.20: AVT–II with sunnhemp(*C. juncea*)

The trial was conducted with five promising entries and two check varieties namely, K 12 Yellow and SH 4 over five locations namely, Barrackpore, Budbud, Kalyani, Pratapgarh and Aduthurai to assess the performance of high yielding strains of sunnhemp in different agro-climatic regions. Location wise results are discussed below and fibre yield data are presented intable 1.19.

Barrackpore: The crop was sown on 08.05.2014 and harvested on 14.08.2014 at the age of 92 days. The check variety SH 4 (9.04 q/ha) outperformed at this location followed by test entry SUIN-5 (8.30 q/ha), SUIN-2 (7.57 q/ha) and SUIN-1 (6.59 q/ha). Entries were significantly different for fibre yield.

AVT-II sunnhemp trial at Barrackpore

Mean performance of 2013 (AVT-I) and 2014 (AVT-II) revealed that none of the test entries performed better than the best check variety SH 4 (9.11 q/ha). Among the test entries, SUIN-5 (8.37 q/ha) was out performing entry followed by SUIN-2 (8.02 q/ha).

Budbud: The trial was sown at this location on 03.06.2014 and harvested on 04.09.2014 at the crop age of 93 days. Out of five test entries, four entries namely, SUIN-4 (9.14 q/ha), SUIN-3 (8.81 q/ha), SUIN-5 (8.18 q/ha) and SUIN-1 (7.34 q/ha) performed better than the best check variety SH 4 (6.09 q/ha). Differences among entries were highly significant.

Mean performance of 2013 (AVT-I) and 2014 (AVT-II) also revealed the same results as test entry SUIN-4 (9.40 q/ha) performed better than the best check variety SH 4 (7.16 q/ha) followed by SUIN-5 (9.29 q/ha), SUIN-3 (9.04 q/ha), and SUIN-1 (8.33 q/ha).

Kalyani: The trial at this centre was sown on 23.05.2014 and harvested on 26.08.2014 at the crop age of 95 days. Test entries SUIN-3 (10.68 q/ha), SUIN-1 (10.34 q/ha) and SUIN-5 (10.00 q/ha) performed better than the best check variety K 12 Yellow (9.66 q/ha) at this location. Performances of entries were non-significant.

Mean performance of 2013 (AVT-I) and 2014 (AVT-II) also revealed same results as test entries SUIN-3 (11.10 q/ha), SUIN-5 (10.11 q/ha) and SUIN-1 (9.86 q/ha) performed better than the best check variety K 12 Yellow (9.70 q/ha). Other test entries were poor performing than the best check variety.

Pratapgarh: The crop was sown on 29.04.2014 and harvested on 28.07.2014 at the age of 90 days. None of the test entries outperformed the best check variety K 12 Yellow (14.00 q/ha) for fibre yield. However, test entries SUIN-3 (13.51 q/ha) and SUIN-5 (12.59 q/ha) out yielded next check variety SH 4 (12.40 q/ha) followed by SUIN-2 (12.36 q/ha). Entries were significantly different for fibre yield.

AVT-II sunnhemp trial at Pratapgarh

Mean performance of 2013 (AVT-I) and 2014 (AVT-II) revealed that entries SUIN-5 (10.15 q/ha) and SUIN-4 (9.99 q/ha) performed better than the best check variety K 12 Yellow (9.90 q/ha) and followed by SUIN-3 (9.76 q/ha) and SUIN-1 (9.56 q/ha).

Aduthurai: The experiment was sown at this centre on 11.06.2014 and the crop was harvested on 11.08.2014 after 61 days of sowing. The fibre yield performance was exceptionally low for almost all entries including checks. However, data of the centre was not analysed and included in the pooled analysis due to very low fibre yield.

National average: Considering national average over locations, test entry SUIN-3 (9.82 q/ha) performed significantly better than the best check variety SH 4 (9.27 q/ha) followed by SUIN-5 (9.77 q/ha), SUIN-4 (9.20 q/ha) and SUIN-1 (9.12 q/ha).

Mean performance of 2013 (AVT-I) and 2014 (AVT-II) revealed that test entry SUIN-5 (9.30 q/ha), SUIN-3 (9.09 q/ha), SUIN-4 (8.75 q/ha) and SUIN-1 (8.69 q/ha) performed better than the best check variety SH 4 (8.42 q/ha).

Table 1.19: Pooled data of AVT-I (2013) and AVT-II (2014) with sunnhemp (*C. juncea*) (fibre yield in q/ha)

Entry	Barrackpore			Budbud			Kalyani			Pratapgarh			Aduthurai		National		
	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014	Mean	2013	2014*	2013	2014	Mean
SUIN-5	8.43	8.30	8.37	10.40	8.18	9.29	10.21	10.00	10.11	7.71	12.59	10.15	7.92	2.34	8.93	9.77	9.30
SUIN-2	8.47	7.57	8.02	7.30	5.14	6.22	10.09	8.98	9.54	6.42	12.36	9.39	6.82	1.68	7.82	8.51	8.13
SUIN-4	8.83	6.08	7.46	9.65	9.14	9.40	8.90	9.32	9.11	7.72	12.26	9.99	6.81	1.42	8.38	9.20	8.75
SUIN-1	9.28	6.59	7.94	9.32	7.34	8.33	9.38	10.34	9.86	6.93	12.19	9.56	6.84	1.49	8.35	9.12	8.69
SUIN-3	9.22	6.26	7.74	9.26	8.81	9.04	11.52	10.68	11.10	6.01	13.51	9.76	6.53	1.35	8.51	9.82	9.09
K12 Yellow+	8.84	5.97	7.41	7.44	5.10	6.27	9.74	9.66	9.70	5.80	14.00	9.90	6.36	2.27	7.64	8.68	8.10
SH 4+	9.18	9.04	9.11	8.23	6.09	7.16	9.50	9.55	9.53	5.47	12.40	8.94	6.29	1.95	7.73	9.27	8.42
G.Mean	8.89	7.12	8.01	8.80	7.11	7.96	9.90	9.79	9.85	6.58	12.76	9.67	6.79	1.79	8.19	9.20	8.64
F test	NS	HS		HS	HS		NS	NS		NS	HS		HS		NS	HS	NS
SEm±	0.29	0.28		0.39	0.81		0.57	0.49		0.61	0.22		0.12		0.19	0.19	0.35
$CD_{(P=0.05)}$	-	0.83		1.15	2.41		-	-		-	0.65		0.34		-	0.54	-
CV %	6.56	7.81		8.83	22.82		11.41	9.94		18.40	3.41		3.39		10.55	10.98	11.10

+; check varieties, *, data not analyzed and included in pooled analysis

Ramie

NP(RB)1.10: AVT-I with ramie (*B. nivea*)

Initial evaluation trial (IET) on ramie constituted with 5 new entries and two checks namely, R-1411 (Hazarika) and R 67-34 (Kanai) during 2012 workshop, conducted during May, 2012 at Ramie Research Station, RRS, Sorbhog only out of three assigned locations *viz.,* UBKV, Coochbehar (W.B.), RRS, Sorbhog and RARS, Nagaon. The same trial was conducted at Bishwanath College of Agriculture (AAU),BishwanathChariali (Sonitpur) in place of RARS, Nagaon during October, 2013 but data reported from the centre is so erratic and therefore not produced.

Sorbhog: IET trial with five entries and two checks *viz.,* R 1411 (Hazarika) and R 67-34 (Kanai) was planted in randomized block design with three replications on 08.05.2012. All the recommended package and practices were followed to raise a good crop. Data recorded on five yield and yield attributing traits *viz.,* plant height (cm), basal diameter (cm), total green weight of four cuttings (q/ha/yr), total stick (cane) weight (q/ha/yr) of four cuttings and total dry fibre yield of four cuttings (q/ha/yr) are presented in table 1.20.

As per the analysis of data, significantly higher plant height was observed in the entry R-52 (111 cm) followed by check R 1418 (109 cm) than the best check R 1411 (108 cm). Entry R-1415 exhibited maximum dry fibre yield (15.59 q/ha//yr) with highest dry fibre recovery (3.4%) followed by R 52 (14.75 q/ha/yr) with 3.4% dry fibre recovery. The entry R-1418 produced maximum green weight (634 q/ha/yr) and green stick (canes) weight (350 q/ha/yr) but due to less dry fibre recovery (1.9 %) the entry could not exhibit higher yield than check varieties. Comparatively lower yield of all the entries observed this year due to increasing density of plants per unit area (>2 year old crop with multiple cuttings) and insufficient and unequal rainfall distribution during the crop season.

Table: 1.20: Mean performance of ramie genotypes under AVT-1 trial during-2014

Entries	Plant height (cm)	Basal diameter (cm)	Green weight (q/ha/yr)	Stick (cane) weight (q/ha/yr*)	Dry fibre yield (q/ha/yr)*
R-1414	103	1.00	450	279	12.73
R-1415	102	0.91	452	294	15.59
R-1416	98	0.90	454	252	10.38
R-1418	109	1.00	634	350	11.92
R-52	111	1.05	494	337	14.75
R 67-34+	104	0.99	458	303	11.85
R 1411+	108	0.99	510	302	13.69
G. Mean	105	0.98	493	303	12.99
SE(m)±	1.90	0.02	19.90	18.42	0.63
$CD_{(P=0.05)}$	5.92	0.07	61.98	57.38	1.98
CV %	3.13	3.85	6.99	10.54	8.42

+; checks, *; total of 4 cuttings and means of three replications

Field view of AVT-I trial with ramie at RRS, Sorbhog during 2014

Flax

NP(FB) 1.7: IET with flax (*L. usitatissimum*)

The trial was conducted with five test entries and one check variety at three locations namely, Pratapgarh, Coochbehar and Kalimpong but fibre yield reported by Pratapgarh centre only. The results are discussed below and data are presented in table 1.21.

Table 1.21: Mean performance of IET with flax at pratapgarh

Entries	Plant height (cm)	Basal diameter (mm)	Green weight (q/ha)	Fibre yield (q/ha)
JRF-10	101.7	4.0	229.2	17.1
JRF-11	103.2	4.0	244.1	14.4
JRF-12	100.8	4.3	256.3	15.5
JRF-13	116.1	4.3	206.5	17.9
JRF-14	86.3	4.1	200.0	13.4
JRF2 +	109.0	4.0	259.1	15.7
G. mean	102.9	4.1	232.5	15.7
F test	HS	NS	S	S
SEm(±)	1.11	0.09	6.80	0.57
$CD_{(P=0.05)}$	3.23	0.27	19.80	1.64
CV%	9.55	8.48	19.93	16.58

+: check variety

Pratapgarh: The trial was sown at this location on 31.10.2013 and harvested on 13.03.2014 after 134 days. Test entry JRF-13 (116.1 cm) attained maximum plant height over check JRF-2 (102.9 cm).Differences among the entries were highly significant.

Regarding dry fibre yield, test entry namely, JRF-13 (17.9 q/ha) recorded highest fibre yield followed by JRF-10 (17.1 q/ha) and check variety JRF 2 (15.7 q/ha).

NP (FB)1.9: AVT-I with flax (*L. usitatissimum*)

Flax trial constituted with five entries with checks namely, JRF 2 and JRF 4 and conducted at two locations viz., Coochbehar and Kalimpong. These centres provided data on morphological characters only but fiber yield data was not documented, since fibre extraction facilities (scutching machine) are not available. Plant height data of these locations were considered for analysis and presented in table 1.22.

Coochbehar: This trial was sown at this centre on 15.11.2013 and harvested on 02.04.14. Entries were not significantly different for plant height character. The maximum plant height at 139 days was observed in the entry JRF-9 (89.67 cm) followed by JRF-6 (86.24 cm), JRF-5 (84.53 cm). Check variety JRF-4 recorded 79.14 cm of plant height.

Kalimpong: Trial at this location was sown on 20.11.2013 and harvested on 10.04.14. Differences among entries were found to be significant. Maximum plant height at 142 days was recorded for the entry JRF-8 (106.82 cm) followed by JRF-9 (105.84 cm), JRF-6 (98.15 cm) and JRF-5 (98.12 cm). Check variety JRF-2 recorded 86.93 cm of plant height.

Table 1.22:Mean performance of flax genotypes under AVT-I during 2013-14

Entry	Plant height (cm)		
	Coochbehar	Kalimpong	Mean
JRF-5	84.53	98.12	91.32
JRF-6	86.24	98.15	92.19
JRF-7	83.55	98.02	90.78
JRF-8	81.83	106.82	94.33
JRF-9	89.67	105.84	97.76
JRF 2+	80.61	90.01	85.31
JRF 4+	79.14	86.93	83.03
G.mean	83.65	97.70	90.67
F-test	NS	Sig.	HS
SEm (±)	4.82	2.29	2.74
$CD_{(P=0.05)}$	-	6.81	5.53
CV (%)	11.54	4.69	

+: check varieties

National average: Data from the pooled analysis over two locations showed highly significant difference for plant height.Test entry JRF-9 (97.76 cm) attained maximum plant height followed by JRF-8 (94.33 cm) and JRF-6 (92.19 cm). Check variety recorded maximum plant height of 83.03 cm.

Adaptive trial

White jute: Two test entries *viz.* JRCJ-2 and NDJC-2011 were evaluated in three locations of West Bengal and one location each in Odisha, Assam, Bihar and Uttar Pradesh. Test entry NDJC-2011 (26.12 q/ha) marginally surpassed both the check varieties JRC 698 (25.51 q/ha) and JRC 517 (25.78 q/ha) by 2.36% and 1.30%, respectively.

Kenaf: Test entries JBMP-1 and JBMP-2 were evaluated at one location each in Odisha and West Bengal. JBMP-1 with an average performance of 27.80 q/ha outyielded national checks AMC 108 and HC 583 by 6.94 % and 1.46%, respectively.

Roselle: Two promising roselle entries namely, JBRP-01 (20.67 q/ha) and AHS-216 (21.54 q/ha) evaluated in farmer's field of Maharastra which outyielded national check AMV 5 (19.54 q/ha) by 5.78% and 10.24%, respectively.

Sunnhemp: Test entries SUIN-62 and SUIN-63 were evaluated at farmer's field of Uttar Pradesh with three check varieties. Test entry SUIN-62 (14.07 q/ha) outyielded the best check SUIN 053 (9.66 q/ha) by 45.70% yield superiority.

Flax: Four trials were conducted at farmer's fields of Uttar Pradesh using test entry JRF-4 and check variety JRF-2. Test entry JRF-4 with average yield of 18.20 q/ha raw fibre surpassed the yield potential of JRF 2 (16.59 q/ha) by 9.67%.

NP(JA) 6.11: Performance of new *C. capsularis* genotypes under different fertilizer schedules

The experiment was conducted at Barrackpore, Kalyani, Coochbehar, Nagaon and Bahraich to study the performance of the promising C. *capsularis* entries under adaptive trials and to develop suitable fertilizer dose for it and the centre wise data are presented below:

Barrackpore: The perusal of data revealed that none of the test genotypes (JRCJ-2 and NDJC-2011) recorded significantly higher basal diameter or fibre yield of capsularis jute at Barrackpore. The basal diameter and fibre yield of *capsularis* jute increased significantly with successive increase in fertilizer dose upto 100:21.8:41.7 (kg/ha) of NPK level while plant height increased significantly upto 80:17.5:33.3 (kg/ha) level only (table 2.1). The interactive effect of variety and nitrogen on fibre yield and yield attributing characters were found to be non-significant.

Table 2.1 Effect of fertilizer schedule on yield attributes and fibre yield of new *capsularis* genotypes at Barrackpore, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
Variety			
V_1 : JRCJ - 2	298.7	1.65	23.99
V_2 : NDJC - 2011	308.9	1.78	25.78
V_3 : JRC 321*	307.2	1.80	24.72
V_4 : JRC 698*	317.7	1.78	25.90
SEm±	5.90	0.04	0.50
$CD_{(P=0.05)}$	NS	0.12	1.46
Fertilizer			
F_1 : 60: 13: 25	284.4	1.72	22.93
F_2 : 80: 17.5: 33.3	315.4	1.71	24.73
F_3 : 100: 21.8: 41.7	324.6	1.84	27.63
SEm±	5.11	0.03	0.43
$CD_{(P=0.05)}$	14.9	0.09	1.26

*Check variety; Fertilizer - (N:P:K, kg/ha)

Kalyani: The experimental data revealed that the effect of variety on basal diameter, green weight and fibre weight of the jute genotypes were non-significant. None of the two entries, recorded significantly higher plant height over the check varieties. Plant height, basal diameter and fibre yield increased significantly upto NPK application of 80 : 17.5 : 33.3 kg/ha level while green weight increased significantly upto 100 : 21.8 : 41.7 kg/ha of NPK application (table 2.2). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

.

Table 2.2 Effect of fertilizer schedule on yield attributes and fibre yield of new *capsularis* genotypes at Kalyani, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1 : JRCJ -2	277.8	1.35	637.0	35.06
V_2 : NDJC- 2011	281.0	1.40	658.0	36.87
V_3 : JRC 321*	276.3	1.34	629.0	35.84
V_4 : JRC 698*	281.0	1.38	632.0	35.40
SEm±	3.28	0.03	9.58	0.49
$CD_{(P=0.05)}$	9.61	NS	NS	NS
Fertilizer				
F_1 : 60: 13: 25	263.6	1.31	608.0	34.06
F_2 : 80: 17.5: 33.3	286.6	1.38	646.0	36.29
F_3 : 100: 21.8: 41.7	294.3	1.41	664.0	37.03
SEm±	2.84	0.02	8.29	0.43
$CD_{(P=0.05)}$	8.32	0.06	24.3	1.26

*Check variety; Fertilizer- (N:P:K, kg/ha)

Coochbehar: The variation in plant height, basal diameter, green weight and fibre yield of the jute genotypes were non-significant. The effect of fertilizer was significant only on green weight which increased significantly upto 80 : 17.5 : 33.3 kg NPK/ha (table 2.3). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

Performance of new *capsularis* genotypes at Coochbehar

Bahraich: The test entry NDJC-2011 recorded significantly higher plant height (331.3 cm), basal diameter (2.28 cm), green weight (458 q/ha) and fibre yield (27.85 q/ha) over both the check varieties JRC 321 and JRC 698. The plant height, basal diameter, green weight and fibre yield of *capsularis* jute increased significantly with successive increase in fertilizer dose upto 100 : 21.8 : 41.7 kg NPK/ha (table 2.4). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

Table 2.3 Effect of fertilizer schedule on yield attributes and fibre yield of new *capsularis* genotypes at Coochbehar, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1 : JRCJ-2	316.5	1.77	419.4	25.71
V_2 : NDJC-2011	315.3	1.66	406.7	26.83
V_3 : JRC 321*	311.5	1.61	410.7	25.33
V_4 : JRC 698*	320.0	1.69	410.0	22.48
SEm±	5.71	0.08	13.1	2.10
$CD_{(P=0.05)}$	NS	NS	NS	NS
Fertilizer				
F_1 : 60: 13: 25	316.2	1.72	384.8	23.20
F_2 : 80: 17.5: 33.3	318.0	1.67	420.1	25.13
F_3 : 100: 21.8: 41.7	313.3	1.66	430.2	26.93
SEm±	4.95	0.07	11.4	1.82
$CD_{(P=0.05)}$	NS	NS	33.4	NS

*Check variety; Fertilizer- (N:P:K, kg/ha)

Table 2.4 Effect of fertilizer schedule on yield attributes and fibre yield of new *capsularis* genotypes at Bahraich, Uttar Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1 : JRCJ -2	319.1	1.93	439.8	26.28
V_2 : NDJC- 2011	331.3	2.28	458.0	27.85
V_3 : JRC 321*	319.6	1.87	405.1	24.64
V_4 : JRC 698*	320.5	1.97	419.1	25.96
SEm±	1.29	0.018	5.38	0.15
$CD_{(P=0.05)}$	3.8	0.05	15.7	0.43
Fertilizer				
F_1 : 60: 13: 25	313.3	1.91	418.0	24.70
F_2 : 80: 17.5: 33.3	323.8	2.04	423.7	26.50
F_3 : 100: 21.8: 41.7	330.8	2.09	449.8	27.35
SEm±	1.12	0.015	4.66	0.13
$CD_{(P=0.05)}$	3.3	0.04	13.7	0.38

*Check variety; Fertilizer- (N:P:K, kg/ha)

Nagaon: The experimental data revealed that fibre yield of NDJC-2011 was significantly at par with check variety JRC 321 only. However, plant height of both the test entries was significantly lower then the check varieties The effect of fertilizer on fibre yield as well as yield attributing characters was non-significant (table 2.5). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

Table 2.5 Effect of fertilizer schedule on yield attributes and fibre yield of new *capsularis* genotypes at Nagaon, Assam

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
Variety			
V_1 : JRCJ - 2	279.8	1.39	22.03
V_2 : NDJC- 2011	288.4	1.49	24.52
V_3 : JRC 321*	296.5	1.57	26.07
V_4 : JRC 698*	304.2	1.61	27.03
SEm±	2.06	0.03	0.63
$CD_{(P=0.05)}$	6.0	NS	1.84
Fertilizer			
F_1 : 60: 13: 25	289.4	1.46	24.01
F_2 : 80: 17.5: 33.3	292.1	1.54	25.18
F_3 : 100: 21.8: 41.7	295.2	1.54	25.55
SEm±	1.78	0.03	0.54
$CD_{(P=0.05)}$	NS	NS	NS

*Check variety; Fertilizer- (N:P:K, kg/ha)

NP (JA) 6.19: Nutrient management for jute-rice/mesta–horse gram cropping system

The experiment was conducted at Bahraich and Katihar for jute and at Aduthurai for mesta and the results of the experiments are summarized below:

Bahraich: The results revealed that all the treatments significantly increased plant height, basal diameter and dry fibre yield of jute over control (table 2.6). The treatment T_7 [100% NPK on ST-TY (TY 4.0 t/ha) + FYM @ 5 t/ha] recorded highest plant height (369.0 cm), basal diameter (1.87 cm) and dry fibre yield (30.95 q/ha) of jute. Application of recommended dose of fertilizer (RDF) in combination with FYM (@5 t/ha) increased the fibre yield of jute by 8.98% over RDF. Experimental data revealed that fibre yield obtained by T_7 was significantly higher over T6 and the magnitude of increase was 2.65% over T_6 treatment. It was further observed that ST-TY based fertilizer application recorded higher fibre yield as compared to that obtained by RDF. However, none of the fertilizer treatments, either in presence or absence of FYM, could achieve the targeted yield. Perusal of data revealed that all the treatments recorded significantly higher grain yield of rice over control. Highest grain yield of rice (40.77 q/ha) was recorded with T_7 treatment [100% NPK on ST-TY (TY 5 t/ha + FYM @ 5 t/ha] which was statistically at par with that of T_5 and T_6 treatments. Application of fertilizer on soil test and targeted yield (ST-TY) basis

recorded significantly higher grain yield over RDF. However, application of inorganic fertilizer on ST-TY basis in presence or absence of FYM could not achieve the targeted yield of rice. The results further indicated that application fertilizer on soil test and targeted yield increased the net profit over RDF by ₹ 19879 to 21183/ha and the profit was further increased by about another ₹ 5000 to 6000/ha when organic matter was included in the fertilizer prescription (table 2.7).

Table 2.6 Yield attributes and fibre yield of jute under integrated nutrient management system at Bahraich, Uttar Pradesh

Treatments	Jute			Rice	
	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)	Grain yield (q/ha)	Straw yield (q/ha)
T_1: Control (without any fertilizer/ organic manure)	213.0	1.11	12.57	16.27	20.33
T_2: Recommended dose of fertilizer (RDF)	317.5	1.51	24.84	26.15	26.95
T_3: RDF + organic manure (equivalent to 5t/ha of FYM)	331.2	1.55	27.07	35.55	36.55
T_4: 100 % NPK on ST-TY (target : jute -3.5 t/ha, rice - 4.5 t/ha)	346.5	1.65	27.55	37.74	38.25
T_5: 100 % NPK on ST-TY (target : jute - 4.0 t/ha, rice - 5.0 t/ha)	351.7	1.77	28.27	38.73	40.09
T_6: T_4 + organic manure (equivalent to 5t/ha of FYM)	360.7	1.83	30.15	39.99	40.15
T_7: T_5 + organic manure (equivalent to 5t/ha of FYM)	369.0	1.87	30.95	40.77	40.68
SEm±	2.90	0.02	0.24	0.95	1.01
$CD_{(P=0.05)}$	8.6	0.06	0.71	2.82	2.99

Table 2.7 Economics of integrated nutrient management in jute-rice at Bahraich, Uttar Pradesh

Treatments	Cost of the cultivation (₹/ha)	Gross income (₹/ha)	Net profit (₹/ha)	B:C ratio
T_1: Control (without any fertilizer/ organic manure)	42227	55094	12867	1.30
T_2: Recommended dose of fertilizer (RDF)	46215	98015	51800	2.12
T_3: RDF + organic manure (equivalent to 5t/ha of FYM)	48697	118842	70145	2.44
T_4: 100 % NPK on ST-TY (target :jute -3.5 t/ha, rice - 4.5 t/ha)	52130	123809	71679	2.37
T_5: 100 % NPK on ST-TY (target :jute -4.0 t/ha, rice - 5.0 t/ha)	54234	127217	72983	2.34
T_6: T_4 + organic manure (equivalent to 5t/ha of FYM)	55872	133315	77443	2.38
T_7: T_5 + organic manure (equivalent to 5t/ha of FYM)	57980	136400	78420	2.35

Katihar: Perusal of data revealed that all the fertilizer treatments recorded significantly higher plant height, basal diameter and fibre yield of jute over control. Highest plant height (308.5 cm), basal diameter (1.83 cm) and dry fibre yield (31.71 q/ha) was recorded with T_7 treatment [100% NPK on ST-TY (TY 4.0 t/ha) + organic manure 5.0 t/ha] (table 2.8). Integration of organic manure @ 5.0 t/ha along with recommended dose of fertilizers (RDF) increased the fibre yield of jute over RDF. Application of fertilizer based on soil test and targeted yield approach recorded higher fibre in jute over RDF. However, soil test and targeted yield based fertilizer application both in presence or absence of organic matter could not achieve any of the targeted yield, i.e. 3.5 and 4.0 t/ha, respectively. Perusal of post-harvest soil test data revealed that all

the treatments recorded higher soil organic C and soil available N, P and K over control (table 2.9). Highest soil organic C (0.53%) soil available N (172 kg/ha) and K_2O (118 kg/ha) were recorded with T_7 treatment whereas highest soil available P_2O_5 (22.7 kg/ha) was recorded with T_6 treatment. It was further observed that all the treatments recorded higher nutrient uptake over control. Highest N (71 kg/ha) and P (18 kg/ha) uptake were recorded with T_7 treatment whereas the highest K uptake (70.8 Kg/ha) was recorded with T_6 treatment (table 2.9).

Table 2.8 Yield attributes and fibre yield of jute under integrated nutrient management system at Katihar, Bihar

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
T_1: Control (without any fertilizer / organic manure)	241.5	1.45	16.80
T_2: Recommended dose of fertilizer (RDF)	260.5	1.59	23.41
T_3: RDF + organic manure (equivalent to 5 t/ha of FYM)	268.5	1.69	24.44
T_4: 100% NPK on ST-TY (Target: jute – 3.5 t/ha, rice – 4.5 t/ha)	276.0	1.70	26.33
T_5: 100% NPK on ST-TY (Target: jute – 4.0 t/ha, rice – 5.0 t/ha)	293.7	1.75	26.83
T_6: T_4 + organic manure (equivalent to 5 t/ha of FYM)	305.7	1.78	30.60
T_7: T_5 + organic manure (equivalent to 5 t/ha of FYM)	308.5	1.83	31.71
SEm±	17.06	0.09	0.96
$CD_{(P=0.05)}$	NS	NS	NS

Table 2.9 Available nutrient status of soil after harvest of jute under integrated nutrient management system at Katihar, Bihar

Treatments	pH	Organic C (%)	Available nutrient at harvest (kg/ha)			Nutrient uptake (kg/ha)		
			N	P_2O_5	K_2O	N	P_2O_5	K_2O
T_1: Control (without any fertilizer / organic manure)	7.35	0.49	127.4	13.9	88.9	37.7	10.2	52.6
T_2: Recommended dose of fertilizers (RDF)	7.41	0.51	146.7	15.3	96.8	55.9	13.3	61.9
T_3: RDF + organic manure (equivalent to 5 t/ha of FYM)	7.28	0.51	151.0	18.6	103.7	61.0	14.2	64.4
T_4: 100% NPK on ST-TY (Target: jute – 3.5 t/ha, rice – 4.5 t/ha)	7.43	0.50	159.8	17.8	105.7	63.8	14.9	65.6
T_5: 100% NPK on ST-TY (Target: jute – 4.0 t/ha, rice – 5.0 t/ha)	7.35	0.52	163.4	19.0	110.5	65.1	15.3	66.9
T_6: T_4 + organic manure (equivalent to 5 t/ha of FYM)	7.37	0.52	168.2	22.7	113.9	70.1	15.6	70.8
T_7: T_5 + organic manure (equivalent to 5 t/ha of FYM)	7.43	0.53	172.7	21.0	118.1	71.1	18.0	59.3
SEm±	0.07	0.008	6.60	1.08	4.86	2.64	1.22	5.37
$CD_{(P=0.05)}$	NS	0.02	19.6	3.2	14.4	7.8	3.6	NS

Aduthurai: Experimental data revealed that all the fertilizer treatments recorded significantly higher plant height, basal diameter and fibre yield of mesta over control (table 2.10). Application of fertilizer on soil test and targeted yield basis could record higher fibre yield than that of RDF. Highest plant height (257.5 cm), basal diameter (1.33 cm) and fibre yield (27.04 q/ha) was recorded with T_7 treatment [100% NPK on ST-TY (TY 3.5 t/ha) + FYM @ 5 t/ha] which was significantly higher over RDF. Targeted yield of mesta (3.0 t/ha) could not be achieved with fertilizer application based on soil test and targeted yield. Integration of FYM along with fertilizer dose based on ST-TY also could not help in achieving the targeted yield. Application of fertilizer on the basis of soil test and higher target yield (target yield 3.5 t/ha), also could not achieve the targeted yield in presence and absence of FYM. Perusal of data also revealed that gross return, net profit and B:C ratio were higher in ST-TY based fertilizer application over RDF. Highest net profit (₹ 36004/ha) was recorded in T_7 treatment whereas highest B: C ratio (2.50) was recorded with T_4. Application of FYM together with ST-TY based fertilizer application did not record any improvement in B: C ratio over ST-TY based fertilizer application (table 2.11).

Table 2.10 Yield attributes and fibre yield of mesta under integrated nutrient management system at Aduthurai, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
T_1: Control (without any fertilizer / organic manure)	174.3	1.00	17.06
T_2: Recommended dose of fertilizer (RDF)	235.5	1.23	21.26
T_3: RDF + organic manure (equivalent to 5 t/ha of FYM)	238.0	1.23	22.83
T_4: 100% NPK on ST-TY (Target: mesta – 3.0 t/ha, rice – 4.5 t/ha)	242.7	1.26	24.41
T_5: 100% NPK on ST-TY (Target: mesta – 3.5 t/ha, rice – 5.0 t/ha)	247.5	1.28	24.67
T_6: T_4 + organic manure (equivalent to 5 t/ha of FYM)	252.7	1.31	26.25
T_7: T_5 + organic manure (equivalent to 5 t/ha of FYM)	257.5	1.33	27.04
SEm±	4.40	0.03	0.57
$CD_{(P=0.05)}$	13.1	0.09	1.69

Table 2.11 Economics of integrated nutrient management in mesta at Aduthurai, Tamil Nadu

Treatments	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B: C ratio
T_1: Control (without any fertilizer / organic manure)	19750	38391	18641	1.94
T_2: Recommended dose of fertilizer (RDF)	21850	47841	25991	2.19
T_3: RDF + organic manure (equivalent to 5 t/ha of FYM)	25350	51384	26034	2.03
T_4: 100% NPK on ST-TY (Target: mesta – 3.0 t/ha, rice – 4.5 t/ha)	22000	54928	32928	2.50
T_5: 100% NPK on ST-TY (Target: mesta – 3.5 t/ha, rice – 5.0 t/ha)	22330	55519	33189	2.49
T_6: T_4 + organic manure (equivalent to 5 t/ha of FYM)	24500	59063	34563	2.41
T_7: T_5 + organic manure (equivalent to 5 t/ha of FYM)	24830	60834	36004	2.45

NP(JA) 6.20 Effect of soil amelioration and integrated nutrient management on yield of jute/mesta based cropping system under acidic soil conditions

The experiment was conducted at Nagaon centre for *olitorius* jute and at Amdalavalasa centre for mesta to develop an integrated nutrient management system for jute and mesta under acidic soil conditions and results are presented below:

ST-CR based fertilizer application in jute at Nagaon

Nagaon: The results revealed that almost all the treatments significantly increased plant height, basal diameter and fibre yield of jute over control except in T_2 (FYM alone) and T_4 (lime alone) treatments (table 2.12). Highest plant height (336.6 cm), basal diameter (1.58 cm) and dry fibre yield (34.59 q/ha) were recorded in T_{11} treatment (150 % NPK on ST-TY + organic manure FYM @ 5 t/ha + lime). Similarly, highest jute fibre yield was recorded with T_{11} treatment when the data was pooled data over 2013 and 2014. Combined application of recommended dose of fertilizers and lime in presence or absence of FYM (5 t/ha) increased

Table 2.12 Yield attributes and fibre yield of jute under integrated nutrient management system on acid soil at Nagaon, Assam

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)	
			2014	Pool*
T_1: Control (without any fertilizer/organic manure)	259.6	1.09	15.54	14.48
T_2 : Organic manure (equivalent to 5 t/ha of FYM)	281.0	1.16	17.58	16.32
T_3 : Recommended dose of fertilizer (RDF)	298.0	1.27	26.87	22.42
T_4 : Control + lime/dolomite application on 25% LR	256.0	1.16	15.69	14.91
T_5 : RDF+ lime/dolomite application on 25% LR	306.3	1.37	28.26	23.63
T_6 : Organic manure (equivalent to 5 t/ha of FYM) + lime/dolomite application on 25% LR	277.6	1.20	18.55	17.36
T_7 : RDF+ Organic manure (equivalent to 5 t/ha of FYM) + lime/ dolomite application on 25% LR	306.3	1.38	27.58	23.88
T_8 : 100% NPK on ST-TY+ lime/dolomite application on 25% LR	313.6	1.38	28.99	24.33
T_9 : 100% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	324.3	1.40	30.45	25.35
T_{10} : 150% NPK on ST-TY+ lime/dolomite application on 25% LR	326.3	1.47	31.83	26.87
T_{11} : 150% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	336.6	1.58	34.59	29.09
SEm±	4.80	0.03	1.00	0.65
$CD_{(P=0.05)}$	14.1	0.08	2.94	1.86

*- pool of 2013 & 2014

fibre yield of jute over RDF, though the increase was non-significant. Application of fertilizers on soil test and target yield basis (100% NPK on ST-TY) together with lime in presence or absence of organic manure could not achieve the target yield (3.5 t/ha). Increasing the fertilizer dose to 150% NPK on ST-TY along with lime in presence or absence of organic manure could achieve the targeted yield with (-9.1%) and (-1.2%) yield deviation, respectively. Highest soil available P (22.3 kg P_2O_5/ha) and K (126 kg K_2O /ha) were recorded with T_8 and T_4 treatments, respectively. All the treatments recorded considerable increase in nutrient uptake over control (table 2.13). Highest N uptake (74.0 kg/ha), P (29.1 kg/ha) and K (53.3 kg/ha) were recorded with T_{11} treatment. There was no perceptible variation in available soil nutrient status in post-harvest soil (table 2.14).

Table 2.13 Nutrient uptake by jute under integrated nutrient management system in acid soil at Nagaon, Assam

Treatments	Nutrient uptake (kg/ha)		
	N	P	K
T_1: Control(without any fertilizer/organic manure)	33.3	13.1	23.9
T_2 : Organic manure (equivalent to 5 t/ha of FYM)	37.6	14.8	27.1
T_3 : Recommended dose of fertilizer (RDF)	57.5	22.6	41.4
T_4 : Control + lime/dolomite application on 25% LR	33.6	13.2	24.2
T_5 : RDF+ lime/dolomite application on 25% LR	60.5	23.7	43.5
T_6 : Organic manure (equivalent to 5 t/ha of FYM) + lime/dolomite application on 25% LR	39.7	15.6	28.6
T_7 : RDF+ Organic manure (equivalent to 5 t/ha of FYM) + lime/dolomite application on 25% LR	59.0	23.2	42.5
T_8 : 100% NPK on ST-TY+ lime/dolomite application on 25% LR	62.0	24.4	44.6
T_9 : 100% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	65.2	25.6	46.9
T_{10} : 150% NPK on ST-TY+ lime/dolomite application on 25% LR	68.1	26.7	49.0
T_{11} : 150% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	74.0	29.1	53.3
SEm±	2.14	0.84	1.54
$CD_{(P=0.05)}$	6.3	2.5	4.5

Amadalavalasa: The experimental results revealed that all the treatments recorded significantly higher plant height, basal diameter, green weight and dry fibre yield of mesta over control. Highest plant height (333.3 cm), basal diameter (1.74 cm), green weight (317 q/ha) and dry fibre yield (16.52 q/ha) of mesta were recorded in T_{10} treatment (150 % NPK on ST-TY + 25 % LR + FYM @ 5 t/ha) (table 2.15). Pooled data also revealed that significantly highest fibre yield of mesta (27.13 q/ha) was recorded with T_{10} treatment. In 2014, application of recommended doses of fertilizers together with lime recorded significantly higher fibre yield of mesta over RDF. Application of inorganic fertilizers based on soil test and targeted yield (100% NPK on ST-TY) either alone or in presence of 25 % LR and organic manure could not achieve the targeted yield (3.5 t/ha). However, incorporation of soil ameliorant (lime) and organic manure in combination with inorganic fertilizer increased the fibre yield of mesta over 100% NPK on ST-TY treatment.

Table 2.14 Available nutrient of soil after jute as influenced by integrated nutrient management on acid soils at Nagaon, Assam

Treatments	Available nutrient (kg/ha) at harvest		
	N	P_2O_5	K_2O
Initial	280.5	21.2	129.8
T_1: Control (without any fertilizer/organic manure)	293.1	18.7	120.1
T_2 : Organic manure (equivalent to 5 t/ha of FYM)	290.0	19.7	120.5
T_3 : Recommended dose of fertilizer (RDF)	281.4	18.3	123.9
T_4 : Control + lime/dolomite application on 25% LR	283.7	18.0	125.5
T_5 : RDF+ lime/dolomite application on 25% LR	283.8	19.1	124.9
T_6 : Organic manure (equivalent to 5 t/ha of FYM) + lime/dolomite application on 25% LR	289.8	20.2	122.6
T_7 : RDF+ Organic manure (equivalent to 5 t/ha of FYM) + lime/dolomite application on 25% LR	286.4	20.1	122.4
T_8 : 100% NPK on ST-TY+ lime/dolomite application on 25% LR	281.6	22.3	122.5
T_9 : 100% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	281.1	21.5	121.9
T_{10} : 150% NPK on ST-TY+ lime/dolomite application on 25% LR	282.1	20.3	124.9
T_{11} : 150% NPK on ST-TY+ Organic manure (equivalent to 5 t/ha of FYM)+lime/dolomite application on 25% LR	283.2	17.8	116.1
SEm±	2.34	0.94	1.54
$CD_{(P=0.05)}$	6.90	NS	4.54

Similar trend was observed in pooled data also. In current year, increasing the fertilizer dose from 100% NPK on ST-TY to 150% NPK on ST-TY increased the fibre yield of mesta but could not achieve the yield target (3.5 t/ha) and the same trend was observed when soil ameliorant (lime) and organic manure were incorporated in soil along with inorganic fertilizer. In 2013, the targeted yield (3.5 t/ha) was achieved when the soil was ameliorated with lime and organic manure was incorporated with prescribed inorganic fertilizer both at 100 and 150% NPK application based on ST-TY approach. However, the pooled data of 2013 and 2014 revealed that targeted yield could not be achieved with application of inorganic fertilizer alone or in combination with lime and organic matter at both levels (100 and 150%) of fertilizer application due to poor fibre yield of mesta in 2014. The heavy downpour and cyclonic weather due to *Hudhud* Cylone during the crop growth period were primarily responsible for poor yield of the crop in 2014.No significant difference in soil available N were recorded among the treatments. Application of recommended doses of fertilizer significantly increased soil available P and K over control. Similar significant increase in soil available P and K over control was also recorded when fertilizer was applied based on soil test and target yield approach (table 2.16).

Table 2.15 Yield attributes and fibre yield of mesta under integrated nutrient management system on acid soil at Amadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)		
				2013	2014	Pool*
T_1: Control (without any fertilizer/organic manure)	165.3	0.56	89.2	10.70	4.64	7.67
T_2 : 100% Recommended Fertilizer Dose (RDF)	248.3	1.23	159.0	20.89	8.27	14.58
T_3 : 100% RDF + lime/dolomite application on 25 % LR (lime requirement)	291.3	1.53	251.3	26.01	13.07	19.54
T_4 : 100% NPK on ST-TY	248.6	1.46	190.6	22.57	9.15	16.24
T_5 : 100% NPK on ST-TY + lime/dolomite application on 25 % LR	287.6	1.64	242.7	29.62	9.91	21.12
T_6 : 100% NPK on ST-TY + lime/dolomite application on 25 % LR + organic manure (equivalent to 5 t/ha of FYM)	329.3	1.72	175.9	35.89	12.62	22.52
T_7 : 150% NPK on ST-TY	248.0	1.50	195.3	24.28	10.16	17.22
T_8 : 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	328.6	1.67	274.9	34.31	14.30	24.30
T_9 : 150% NPK on ST-TY + lime/dolomite application on 25 % LR	280.3	1.64	260.4	30.30	13.54	21.93
T_{10}: 150% NPK on ST-TY + lime/dolomite application on 25 % LR + organic manure (equivalent to 5 t/ha of FYM)	333.3	1.74	317.6	37.73	16.52	27.13
SEm±	5.50	0.09	9.31	1.74	0.48	0.90
$CD_{(P=0.05)}$	16.33	0.27	27.6	5.17	1.42	2.58

*- pool of 2013 & 2014

Table 2.16 Available nutrient status of soil after harvest of mesta under integrated nutrient management system on acid soil at Amadalavalasa, Andhra Pradesh

Treatments	Available nutrients (kg/ha)		
	N	P_2O_5	K_2O
T_1: Control (without any fertilizer/organic manure)	238.5	19.5	117.3
T_2 : 100% Recommended Fertilizer Dose (RDF)	238.7	19.9	119.8
T_3 : 100% RDF + lime/dolomite application on 25 % LR (lime requirement)	242.1	20.0	117.2
T_4 : 100% NPK on ST-TY	241.3	19.9	119.8
T_5 : 100% NPK on ST-TY + lime/dolomite application on 25 % LR	240.6	19.5	118.1
T_6 : 100% NPK on ST-TY + lime/dolomite application on 25 % LR + organic manure (equivalent to 5 t/ha of FYM)	240.1	19.8	120.3
T_7 : 150% NPK on ST-TY	240.4	20.4	119.5
T_8 : 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	240.3	20.3	119.7
T_9 : 150% NPK on ST-TY + lime/dolomite application on 25 % LR	240.0	20.6	200.0
T_{10}: 150% NPK on ST-TY + lime/dolomite application on 25 % LR + organic manure (equivalent to 5 t/ha of FYM)	240.9	19.9	119.8
SEm±	1.13	0.09	0.57
$CD_{(P=0.05)}$	NS	0.3	1.7

NP (JA) 7.10 (modified): Integrated weed management in jute, mesta and sunhemp

The experiment was conducted to develop integrated weed management schedule for jute at Kalyani, Coochbehar, Nagaon, Kendrapara, Bahraich and Katihar; for mesta at Aduthurai and Amadalavalasa and for sunhemp at Pratapgarh. Centre wise results are presented below:

Nagaon: All the weed control treatments recorded significantly higher plant height, basal diameter and fibre yield of jute as compared to unweeded check (table 2.17). Highest fibre yield (29.75 q/ha) was recorded with T_7 (two hand weeding at 15 and 21 DAE) treatment which was at par with fibre yield of all weed control treatments, except T_6 (butachlor @1.5 kg/ha +1 HW at 15 DAE) treatment. The lowest weed biomass was recorded with T_3 (Nail weeder1st at 5 DAE and 2nd at 10 DAE + 1 HW with in row at 15 DAE) at early crop growth stage (15 DAS), whereas at later crop growth stage (35 and 45 DAS), the lowest weed biomass was recorded with T_5 (quizalofop ethyl 5 EC @ 60 g/ha at 15 DAE + one hand weeding at 21 DAE) and T_7 (two hand weeding at 15 and 21 DAE) (table 2.18). Nutrient uptake by jute was significantly higher and nutrients removal by weeds was lower in all weed control treatments compared to unweeded check (table 2.19). No significant variation was observed in available nutrient status of soil of the experimental plots (both treated and control) after harvest of jute (table 2.20). The pooled analysis for fibre yield of 2013 and 2014 indicated that two hand weeding recorded the highest fibre yield (28.58 q/ha) which was at par with T_2 (pretilachlor @ 900 ml/ha + 1 HW at 15 DAE), T_3 (Nail weeder1st at 5 DAE and 2nd at 10 DAE + 1 HW with in row at 15 DAE) and T_4 (Nail weeder1st at 5 DAE + scrapper at 15 DAE + 1 HW with in row at 15 DAE) treatments. Thus, either pretilachlor @ 900 ml/ha with one hand weeding or use of Nail weeder twice (5 and 10 DAE) with one hand weeding (for intra row weeding) is recommended for weed control in jute for Nagaon region.

Table 2.17 Yield attributes and fibre yield of jute under different weed control methods at Nagaon, Assam

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)	
			2014	Pool*
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	291.0	1.26	25.30	24.47
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	297.3	1.31	27.96	26.19
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	295.6	1.28	27.68	26.71
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	304.0	1.35	28.47	27.32
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	288.3	1.28	26.15	24.99
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	285.3	1.21	23.80	23.53
T_7: Hand weeding twice (15 & 21 DAE)	306.3	1.39	29.75	28.58
T_8: Unweeded control	259.0	1.06	13.14	13.14
SEm±	6.42	0.04	1.73	0.95
$CD_{(P=0.05)}$	19.4	0.12	5.24	2.75

DAE: days after crop emergence *- pool of 2013 & 2014

Table 2.18 Weed biomass in jute under different weed control methods at Nagaon, Assam

Treatments	Weed biomass (q/ha)		
	15 DAS	35 DAS	45 DAS
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	1.54	1.31	1.77
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	1.39	1.21	1.64
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	0.71	0.98	1.65
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	1.33	1.11	1.50
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	3.08	0.90	1.21
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	1.96	1.29	1.59
T_7: Hand weeding twice (15 & 21 DAE)	3.09	0.86	1.22
T_8: Unweeded control	3.38	5.18	7.08
SEm±	0.17	0.12	0.22
$CD_{(P=0.05)}$	0.51	0.36	0.67

DAE: days after crop emergence

Table 2.19 Nutrient uptake by jute and weed under different weed control methods at Nagaon, Assam

Treatments	Nutrient uptake by jute at harvest (kg/ha)			Nutrient uptake by weed at 45 DAS (kg/ha)		
	N	P	K	N	P	K
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	58.6	28.0	39.0	29.4	6.8	1.6
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	64.6	30.8	43.1	27.3	6.3	1.5
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	63.9	30.5	42.6	27.5	6.4	1.5
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	65.8	31.4	43.9	25.0	5.8	1.4
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	60.4	28.9	40.3	20.1	4.6	1.1
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	55.0	26.3	36.7	26.4	6.1	1.5
T_7: Hand weeding twice (15 & 21 DAE)	68.7	32.8	45.8	20.4	4.7	1.1
T_8: Unweeded control	30.4	14.5	20.2	117.7	27.2	6.4
SEm±	4.01	1.92	2.67	3.76	0.87	0.21
$CD_{(P=0.05)}$	12.2	5.8	8.1	11.4	2.6	0.6

DAE: days after crop emergence

Table 2.20 Available nutrient status of soil under different weed control methods in jute at Nagaon, Assam

Treatments	Available nutrients in soil (kg/ha) at harvest		
	N	P_2O_5	K_2O
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	264.8	25.2	188.9
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	262.9	25.1	192.9
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	257.9	25.5	186.2
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	261.4	24.6	189.1
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	267.8	26.9	184.1
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	273.0	24.3	193.2
T_7: Hand weeding twice (15 & 21 DAE)	261.1	25.4	191.6
T_8: Unweeded control	251.3	21.2	187.2
SEm±	5.10	1.21	3.02
$CD_{(P=0.05)}$	NS	NS	NS

DAE: days after crop emergence

Bahraich: All weed control treatments significantly increased the plant height, basal diameter and fibre yield of jute compared to unweeded check (table 2.21). Both T_2 (butachlor 50 EC @ 1.5 kg a.i./ha +1 HW/mechanical weeding at 15-20 DAE) and T_4 (butachlor 5G @1.5 kg/ha +1 HW at 15-20 DAE) treatments recorded significantly higher fibre yield over other weed control treatments and were statistically at par with T_8 treatment (two hand weeding) in this regard. Significant reduction in weed biomass was also recorded in all weed control treatments compared to unweeded control (table 2.22). Highest weed control efficiency (77.38-86.32%) was recorded with T_8 treatment (two hand weeding at 15-20 DAE and 35-40 DAE) followed by T_4 treatment (butachlor 5G @1.5 kg/ha +1 HW at 15-20 DAE) (70.01-72.0%) at all the stages of crop growth. Maximum gross return (₹ 64460/ha) was recorded with T_8 treatment while net profit (₹ 30734/ha) and benefit-cost ratio (2.03) were found to be highest with T_2 treatment followed by T_4 treatment. Pooled analysis of data for 2013 and 2014 revealed that two hand weeding in jute recorded maximum fibre yield of the crop (30.12 q/ha) closely followed by T_6 (quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/l at 15 DAE + 1 HW / mechanical weeding at 15-20 days after herbicide application) , T_4 (butachlor 5G @ 1.5 kg a.i./ha + 1 HW/mechanical weeding at 15-20 DAE) and T_2 (butachlor 50 EC @1.5 kg a.i./ha +1 HW/mechanical weeding at 15-20 DAE) treatments (table 2.23).

Thus, considering the crop yield, reduction in weed growth and economics of weed control, either butachlor 5G or 50% EC @ 1.5 kg a.i./ha along with one hand weeding or use of Nail Weeder twice (5 and 10 DAE) is recommended for weed control in jute for Bahraich region.

Table 2.21 Yield attributes and fibre yield of jute under different weed control methods at Bahraich, Uttar Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Plant population (lakh/ha)	Green biomass (q/ha)	Fibre yield (q/ha)	
					2014	Pool*
T_1: Butachlor 50 % EC @ 1 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	319.3	1.96	2.9	420	25.10	25.69
T_2: Butachlor 50 % EC @ 1.5 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	349.3	2.03	2.9	435	28.25	28.23
T_3: Butachlor 5G @ 1 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	329.5	1.98	2.8	414	25.99	26.58
T_4: Butachlor 5G @ 1.5 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	358.7	2.09	2.9	436	28.42	28.49
T_5: Pretilachlor 50 % EC @ 1 kg a.i./ha (at sowing with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	340.5	1.88	2.9	384	25.65	25.83
T_6: Quizalofop ethyl @ 60 g a.i. /ha + sticker @ 1 ml/litre at 15 DAE + 1 HW/mechanical weeding (nail weeder) at 15-20 days after herbicide application	358.2	2.06	2.8	403	27.45	28.64
T_7: Unweeded check	218.6	1.19	1.2	198	11.15	9.91
T_8 : 2 hand weeding (HW)/ /mechanical weeding (nail weeder) at 15-20 DAE and 35-40 DAE	367.6	2.23	3.0	472	29.73	30.12
SEm±	2.77	0.05	0.03	9.08	0.26	0.17
$CD_{(P=0.05)}$	8.44	0.15	0.09	27.5	0.78	0.49

HW : hand weeding; DAE: days after crop emergence *- pool of 2013 & 2014

Table 2.22 Weed biomass and weed control efficiency under different weed control methods at Bahraich, Uttar Pradesh

Treatments	Weed biomass (q/ha)			Weed control efficiency (%)		
	15 DAS	35 DAS	45 DAS	15 DAS	35 DAS	45 DAS
T_1: Butachlor 50 % EC @ 1 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	2.64	3.31	5.34	65.62	65.94	60.24
T_2: Butachlor 50 % EC @ 1.5 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	2.41	2.98	4.47	68.61	69.34	66.74
T_3: Butachlor 5G @ 1 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	2.51	3.18	4.84	67.31	67.28	63.98
T_4: Butachlor 5G @ 1.5 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	2.15	2.72	3.95	72.00	72.01	70.61
T_5: Pretilachlor 50 % EC @ 1 kg a.i./ha (at sowing with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	3.24	4.09	5.85	57.81	57.92	56.54
T_6 : Quizalofop ethyl @ 60 g a.i. /ha + sticker @ 1 ml/litre at 15 DAE + 1 HW/mechanical weeding (nail weeder) at 15-20 days after herbicide application	2.24	2.92	4.17	70.83	69.95	68.97
T_7 : Unweeded check	7.68	9.72	13.44	00.00	00.00	00.00
T_8 : 2 hand weeding (HW)/ /mechanical weeding (nail weeder) at 15-20 DAE and 35-40 DAE	1.05	1.81	3.04	86.32	81.48	77.38

HW : hand weeding; DAE: days after crop emergence

Table 2.23 Economics of different weed control methods in jute at Bahraich, Uttar Pradesh

Treatments	Cost of the cultivation (₹/ha)	Gross income (₹/ha)	Net profit (₹/ha)	B:C ratio
T_1: Butachlor 50 % EC @ 1 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	30516	54480	23964	1.78
T_2: Butachlor 50 % EC @ 1.5 kg a.i./ha (within 24 hrs of rain or irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	30626	61360	30734	2.03
T_3: Butachlor 5G @ 1 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	30896	56260	25364	1.82
T_4: Butachlor 5G @ 1.5 kg a.i./ha (with sowing for rainfed or with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	31196	61740	30544	1.97
T_5: Pretilachlor 50 % EC @ 1 kg a.i./ha (at sowing with irrigation) + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE.	30896	55570	24674	1.79
T_6 : Quizalofop ethyl @ 60 g a.i. /ha + sticker @ 1 ml/litre at 15 DAE + 1 HW/ mechanical weeding (nail weeder) at 15-20 days after herbicide application	30325	59720	29395	1.96
T_7 : Unweeded check	16648	23560	6912	1.41
T_8 : 2 hand weeding (HW)/ /mechanical weeding (nail weeder) at 15-20 DAE and 35-40 DAE	34556	64460	29904	1.86

HW : hand weeding; DAE: days after crop emergence

Coochbehar: All weed control treatments recorded significantly higher plant height, green weight and fibre yield of jute compared to unweeded control though the value of the said parameters did not vary significantly among the weed control treatments (table 2.24). The highest green weight (412 q/ha) and fibre yield (27.17 q/ha) were recorded with T_7 (hand weeding twice) closely followed by T_2 treatment (pretilachlor @ 900 ml/ha + 1 HW at 15 DAE).

Table 2.24 Yield attributes and fibre yield of jute under different weed control methods at Coochbehar, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	331.2	1.34	368.6	25.32
T_2: Pretilachlor 50% EC @ 900 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	346.6	1.32	373.4	26.42
T_3: Nail weeder-1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	322.7	1.16	348.6	23.35
T_4: Nail weeder at 5-6 DAE + Scrapper at 15 DAE + one hand weeding (within the row) at 15 DAE	306.5	1.34	352.5	24.83
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	306.0	1.30	365.5	25.25
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha + one hand weeding (15 DAE)	304.4	1.28	360.7	25.02
T_7: Hand weeding twice (15 & 21 DAE)	305.9	1.45	412.3	27.17
T_8: Un-weeded control	201.9	0.90	238.8	15.75
SEm±	19.9	0.09	28.9	2.00
$CD_{(P=0.05)}$	60.5	0.27	87.6	6.06

DAE: days after crop emergence

Kalyani: The experimental data revealed that all weed control treatments significantly increased the plant height and fibre yield compared to unweeded check (table 2.25). Maximum fibre yield (37.58 q/ha) was recorded with T_3 (Nail weeder1st at 5-6 DAE and 2nd at 10 DAE + 1 HW with in row at 15 DAE) which was at par with T_4 (Nail weeder at 5-6 DAE and scrapper at 15 DAE + 1 HW with in row at 15 DAE) and T_7 (Two hand weeding) but significantly higher than remaining other treatments. All the weed control treatments, particularly the Nail weeder treatments, significantly reduced the weed biomass compared to unweeded check at all crop growth stages (table 2.25). The pooled analysis of 2013 and 2014 revealed that use of Nail weeder along with hand weeding (T_3

Integrated weed management in jute at Kalyani

and T_4) recorded significantly higher fibre yield over application of herbicide along with hand weeding. Thus, use of Nail weeder alone or in combination with scrapper followed by one hand weeding is recommended for weed control in *olitorius* jute at Kalyani, West Bengal.

Table 2.25 Yield attributes, fibre yield of jute and weed biomass under different weed control methods at Kalyani, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)		Weed Biomass (q/ha)		
				2014	Pool*	15	30	45
T_1: Pretilachlor 50% EC @ 450 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	302.6	1.29	638.1	31.92	31.96	1.24	3.15	4.48
T_2: Pretilachlor 50% EC @ 900 ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	316.6	1.39	680.3	34.03	33.79	1.09	2.75	3.67
T_3: Nail weeder-1st at 5-6 DAE (at field capasity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	326.3	1.52	751.4	37.58	37.74	0.85	1.97	2.50
T_4: Nail weeder at 5-6 DAE + Scrapper at 15 DAE + one hand weeding (within the row) at 15 DAE	328.3	1.44	749.1	37.47	36.32	0.89	2.09	3.19
T_5: Quizalofop ethyl 5% EC @ 60 g/ha at 15 DAE + one hand weeding (21 DAE)	304.6	1.26	629.4	31.50	33.33	1.18	3.28	3.80
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha + one hand weeding (15 DAE)	313.6	1.34	695.5	34.81	33.68	1.06	2.72	3.69
T_7: Hand weeding twice (15 & 21 DAE)	326.6	1.42	736.9	36.86	37.24	0.94	2.06	2.61
T_8: Un-weeded control	243.6	1.04	275.3	13.78	14.34	3.58	9.99	13.17
SEm±	0.45	0.05	17.6	0.87	0.69	0.10	0.38	0.34
$CD_{(P=0.05)}$	1.36	0.15	53.3	2.63	1.99	0.30	1.15	1.03

DAE: days after crop emergence *- pool of 2013 & 2014

Kendrapara: All weed control treatments significantly increased the plant height, basal diameter and fibre yield over unweeded check. The highest plant height (358.3 cm), basal diameter (1.49 cm) and fibre yield (29.37 q/ha) of jute was recorded with T_5 (quizalofop ethyl @ 60 g/ha at 15 DAE + sticker @ 1 ml/l + one hand weeding at 15-20 days after herbicide application) treatment and the values of the said parameters were statistically at par with those recorded with other weed control treatments (table 2.26). All weed control treatments significantly reduced the weed biomass as compared to unweeded check and the lowest weed biomass was recorded in T_5 at 30 DAS and 45 DAS (table 2.27).

Integrated weed management in jute at Kendrapara

Table 2.26 Yield attributes and fibre yield of jute under different weed control methods at Kendrapara, Odisha

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)	
				2014	Pool *
T_1 : Butachlor 50% EC @ 1 kg a.i./ha + 1 HW /mechanical weeding (nail weeder) at 15-20 DAE	330.0	1.31	521.5	25.20	25.70
T_2 : Butachlor 50% EC @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	343.0	1.39	533.1	25.97	26.40
T_3 : Butachlor 5G @ 1 kg a.i./ha+ 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	341.3	1.38	503.0	25.00	25.17
T_4 : Butachlor 5G @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	331.0	1.33	527.2	25.47	26.00
T_5 : Quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/litre at 15 DAE + 1 HW //mechanical weeding (nail weeder) at 15-20 DAE	358.3	1.49	573.5	29.37	28.95
T_6 : Unweeded check	297.0	1.12	372.5	18.37	19.27
T_7 : 2 hand weeding (HW)/Mechanical Weeding (nail weeder) at 15-20 DAE and 35-40 DAE	352.6	1.44	548.1	27.37	27.45
SEm±	11.54	0.04	32.7	1.78	1.25
$CD_{(P=0.05)}$	35.5	0.12	100.0	5.48	3.64

HW : hand weeding, DAE: days after crop emergence *- pool of 2013 & 2014

Table 2.27 Weed biomass in jute under different weed control methods at Kendrapara, Odisha

Treatments	Weed dry biomass (q/ha)		
	15 DAS	30 DAS	45 DAS
T_1 : Butachlor 50% EC @ 1 kg a.i./ha + 1 HW /mechanical weeding (nail weeder) at 15-20 DAE	1.14	1.39	2.43
T_2 : Butachlor 50% EC @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	1.10	1.49	2.25
T_3 : Butachlor 5G @ 1 kg a.i./ha+ 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	1.22	1.79	2.66
T_4 : Butachlor 5G @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	1.19	1.77	2.56
T_5 : Quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/litre at 15 DAE + 1 HW // mechanical weeding (nail weeder) at 15-20 DAE	1.58	1.12	0.63
T_6 : Unweeded check	1.97	4.15	9.33
T_7 : 2 hand weeding (HW)/Mechanical Weeding (nail weeder) at 15-20 DAE and 35-40 DAE	1.41	1.33	0.55
SEm±	0.10	0.14	0.25
$CD_{(P=0.05)}$	0.31	0.43	0.77

HW : hand weeding, DAE: days after crop emergence

Among the weed control treatments, T_7 recorded the highest weed control efficiency (78.71 %) followed by T_5 (78.47 %). Net return (₹ 46218/ha) and benefit-cost ratio (2.17) recorded the highest with T_5 in jute at Kendrapara, Odisha (table 2.28). Pooled analysis of data of 2013 and 2014 also indicated that application of quizalofop ethyl @ 60 g/ha at 15 DAE followed by one hand weeding at 15-20 days after herbicide application recorded highest fibre yield of jute with significant reduction in weed biomass and is recommended for weed control in jute in Kendrpara region of Odisha.

Table 2.28 Weed control efficiency (WCE), weed index (WI) and economics of different weed control methods in jute at Kendrapara, Odisha

Treatments	WCE (%)	WI	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B:C ratio
T_1 : Butachlor 50% EC @ 1 kg a.i./ha + 1 HW / mechanical weeding (nail weeder) at 15-20 DAE	67.89	11.60	20325	57944	37619	1.85
T_2 : Butachlor 50% EC @ 1.5 kg a.i./ha + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE	68.73	8.85	20575	59746	39171	1.90
T_3 : Butachlor 5G @ 1 kg a.i./ha+ 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE	63.24	12.25	20425	57518	37093	1.82
T_4 : Butachlor 5G @ 1.5 kg a.i./ha + 1 HW/ mechanical weeding (nail weeder) at 15-20 DAE	64.22	10.60	20725	58604	37879	1.83
T_5 : Quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/litre at 15 DAE + 1 HW //mechanical weeding (nail weeder) at 15-20 DAE	78.47	0.00	21325	67543	46218	2.17
T_6 : Unweeded check	0.00	35.56	19200	42243	23043	1.20
T_7 : 2 hand weeding (HW)/Mechanical Weeding (nail weeder) at 15-20 DAE and 35-40 DAE	78.71	3.94	21075	62969	41894	1.99

HW : hand weeding, DAE: days after crop emergence

Katihar: The experimental data revealed that all weed control treatments significantly increased plant height and fibre yield of jute over unweeded check (table 2.29). The highest fibre yield (28.33 q/ha) was recorded with T_8 (two hand weeding) and it was at par with T_6 (quizalofop ethyl @ 60 g/ha at 15 DAE + one hand weeding at 15-20 days after herbicide application) and T_2 (butachlor @1.5 kg a.i./ha +1 HW at 15-20 DAE) treatments. Weed control treatments significantly reduced the weed biomass as compared to unweeded check at 15 DAS and 45 DAS (table 2.29) and maximum reduction was recorded with T_8 followed by T_6 treatment. Similarly, the weed control efficiency (51%), net return (₹ 41775/ha) and B:C ratio (1.96) of quizalofop ethyl treatment was comparable to hand weeding treatment (57 %, ₹ 45637/ha & 2.04) (table 2.30). The pooled data of 2013 and 2014 also revealed that fibre yield of jute recorded with T_6 (quizalofop ethyl @ 60 g/ha at 15 DAE + one hand weeding at 15-20 days after herbicide application) was at par with yield with T_8 (two hand weeding) treatment. Thus application of quizalofop ethyl @ 60 g/ha at 15 DAE followed by one hand weeding at 15-20 days after herbicide application is recommended for weed control in jute in Katihar region of Bihar.

Table 2.29 Yield attributes and fibre yield of jute and weed dry biomass under different weed control methods at Katihar, Bihar

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)		Weed dry biomass (q/ha)	
			2014	Pool*	15 DAS	45 DAS
T_1 : Butachlor 50% EC @ 1 kg a.i./ha + 1 HW /mechanical weeding (nail weeder) at 15-20 DAE	265.0	1.59	20.18	19.33	1.44	3.03
T_2 : Butachlor 50% EC @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	289.6	1.71	25.21	23.10	1.26	2.42
T_3 : Butachlor 5G @ 1 kg a.i./ha+ 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	256.3	1.49	19.57	20.48	1.52	3.13
T_4 : Butachlor 5G @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	261.6	1.56	21.70	22.49	1.37	2.78
T_5 : Pretilachlor 50% EC @ 1 kg a.i./ha+ 1 HW /mechanical weeding (nail weeder) at 15-20 DAE*	280.0	1.66	24.19	24.76	1.33	2.65
T_6 : Quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/litre at 15 DAE + 1 HW / mechanical weeding (nail weeder) at 15-20 DAE*	294.6	1.75	26.29	27.01	1.22	2.15
T_7 : Unweeded check	233.3	1.44	13.23	13.12	3.27	4.45
T_8 : 2 hand weeding (HW)/Mechanical Weeding (nail weeder) at 15-20 DAE and 35-40 DAE	302.6	1.80	28.33	29.08	1.10	1.90
SEm±	8.92	0.06	1.18	0.94	0.09	0.23
$CD_{(P=0.05)}$	27.0	0.18	3.57	2.72	0.27	0.69

HW : hand weeding, DAE: days after crop emergence *pool of 2013 & 2014

Table 2.30 Weed index (WI), weed control efficiency (WCE) and economics of different weed control methods in jute at Katihar, Bihar

Treatments	WI	WCE	Gross return (₹/ha)	Net returns (₹/ha)	B:C ratio
T_1 : Butachlor 50% EC @ 1 kg a.i./ha + 1 HW /mechanical weeding (nail weeder) at 15-20 DAE	0.28	0.31	48440	28127	1.38
T_2 : Butachlor 50% EC @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	0.11	0.45	60496	39933	1.94
T_3 : Butachlor 5G @ 1 kg a.i./ha+ 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	0.31	0.28	46960	26547	1.30
T_4 : Butachlor 5G @ 1.5 kg a.i./ha + 1 HW/mechanical weeding (nail weeder) at 15-20 DAE	0.20	0.39	52088	31375	1.51
T_5 : Pretilachlor 50% EC @ 1 kg a.i./ha+ 1 HW /mechanical weeding (nail weeder) at 15-20 DAE*	0.15	0.40	58048	37235	1.79
T_6 : Quizalofop ethyl @ 60 g a.i./ha + sticker @ 1 ml/litre at 15 DAE + 1 HW / mechanical weeding (nail weeder) at 15-20 DAE*	0.07	0.52	63088	41775	1.96
T_7 : Unweeded check	0.54	0.00	31760	15397	0.94
T_8 : 2 hand weeding (HW)/Mechanical Weeding (nail weeder) at 15-20 DAE and 35-40 DAE	0.00	0.57	68000	45637	2.04
SEm±	0.04	0.05	2840	2840	0.14
$CD_{(P=0.05)}$	0.12	0.15	8613	8613	0.42

HW : hand weeding, DAE: days after crop emergence *pool of 2013 & 2014

Aduthurai: The experimental data revealed that all weed control treatments significantly increased the plant height, basal diameter and fibre yield of mesta compared to unweeded check (table 2.31). The highest fibre yield (26.42 q/ha) was recorded in T_7 (two hand weeding) treatment which was significantly higher than yield with other weed control treatments. Lowest weed biomass at 35 and 45 DAS was recorded with T_7 treatment followed by T_5 (quizalofop ethyl @ 60 g a.i./ha at 15 DAE + one hand weeding at 15-20 days after herbicide application) (table 2.31). The highest gross return (₹ 59453/ha), net return (₹ 36603/ha) and benefit-cost ratio (2.60) were also recorded in T_7 treatment followed by quizalofop ethyl treatment (T_5) (table 2.32). Pooled analysis of 2013 and 2014 data revealed that highest fibre yield (25.50 q/ha) of jute was recorded with hand weeding (T_7) treatment followed by application of quizalofop ethyl @ 60 g/ha at 15 DAE along with one hand weeding at 15-20 days after herbicide application is recommended for weed control in mesta in Aduthurai region of Tamil Nadu.

Table 2.31 Yield attributes, fibre yield of mesta and weed dry biomass under different weed control methods at Aduthurai , Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)		Weed dry biomass (q/ha)		
			2014	Pool*	15 DAS	35 DAS	45 DAS
T_1: Pretilachlor 50% EC @ 450ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	216.6	1.13	18.33	18.80	0.44	0.22	0.46
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	220.5	1.18	20.56	21.11	0.38	0.23	0.42
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	215.3	1.13	17.94	20.30	0.56	0.37	0.56
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	218.0	1.16	19.37	20.79	0.56	0.36	0.56
T_5: Quizalofop ethyl 5% EC @ 60 g a.i./ ha at 15 DAE + one hand weeding (21 DAE)	226.4	1.20	22.37	22.86	0.76	0.14	0.37
T_6: Butachlor 50% EC or 5%G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	218.3	1.17	20.22	20.52	0.47	0.29	0.45
T_7: Hand weeding twice (15 & 21 DAE)	229.7	1.27	26.42	25.50	0.77	0.15	0.32
T_8: Unweeded control	175.8	0.95	7.72	8.62	0.80	2.54	4.97
SEm±	3.06	0.27	0.63	0.45	0.04	0.09	0.19
$CD_{(P=0.05)}$	4.3	0.82	1.91	1.30	0.12	0.27	0.58

DAE: days after crop emergence *pool of 2013 & 2014

Table 2.32 Economics of different weed control methods in mesta at Aduthurai, Tamil Nadu

Treatments	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B: C ratio
T_1: Pretilachlor 50% EC @ 450ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	20525	41258	20733	2.01
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	20675	46275	25600	2.24
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	21550	40380	18830	1.87
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	21550	43598	22048	2.02
T_5: Quizalofop ethyl 5% EC @ 60 g a.i./ha at 15 DAE + one hand weeding (21 DAE)	20550	50348	29798	2.45
T_6: Butachlor 50% EC or 5% G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	20550	45525	24975	2.22
T_7: Hand weeding twice (15 & 21 DAE)	22850	59453	36603	2.60
T_8: Unweeded control	18750	17378	-1373	0.93

DAE: days after crop emergence

Amadalavalasa: All weed control treatments significantly increased the plant height, basal diameter and fibre yield of mesta as compared to unweeded check (table 2.33). Application of pretilachlor 50% EC @ 900 ml/ha followed by one hand weeding at 15 DAE (T_2) recorded significantly higher fibre yield (27.16 q/ha) over other weed control treatments and also recorded lowest weed biomass at all the stages of crop growth (table 2.33). Pooled analysis of fibre yield data of 2013 and 2014 also revealed that maximum fibre yield (26.39 q/ha) was recorded in T_2 treatment (table 2.33). Thus application of pretilachlor 50% EC @ 900 ml/ha at 45-58 hours of irrigation followed by one hand weeding at 15 DAE is recommended for weed control in mesta in Amadalavalasa region of Andhra Pradesh.

Pratapgarh: The experimental data revealed that all weed control treatments significantly increased the plant height, basal diameter and fibre yield of sunnhemp compared to unweeded check (table 2.34). Highest fibre yield (10.47 q/ha) was recorded with weed free check (T_9) which was at par the same recorded with T_7 (hand weeding twice), T_4 (nail weeder + scrapper + 1 hand weeding) and T_3 (nail weeder twice + 1 hand weeding) treatments. The fibre yield recorded with exclusively mechanical weeding treatments *i.e.* T_3 (Nail weeder1st at 5 DAE and 2nd at 10 DAE + 1 HW with in row

Weed free plot in sunnhemp at Pratapgarh

at 15 DAE), T_4 (nail weeder 1st at 5-6 DAE + scrapper at 15 DAE + one hand weeding at 15 DAE) and T_7 (hand weeding twice) were at par but significantly higher than herbicides + hand weeding treatments. Pooled analysis of 2013 and 2014 indicated that T_3 and T_4 treatments had comparable fibre yield of sunnhemp with T_7 treatment (table 2.34). Thus use of nail weeder twice at 5-6 DAE and 10 DAE or a combination of Nail weeder once at 5-6 DAE, scrapper once at 15 DAE and one hand weeding at 15 DAE is recommended for weed control in sunnhemp at Pratapgarh, Uttar Pradesh.

Table 2.33 Yield attributes and fibre yield of mesta and dry biomass of weed under different weed control methods at Amadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)		Weed dry biomass (kg/ha)		
				2014	Pool *	15 DAS	30 DAS	45 DAS
T_1: Pretilachlor 50% EC @ 450ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	345.0	1.59	441.3	21.95	22.28	0.02	0.25	0.42
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	360.0	1.93	546.3	27.16	26.39	0.00	0.03	0.23
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	345.0	1.51	404.6	20.12	19.90	0.73	0.66	1.27
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	350.0	1.65	443.3	22.04	20.56	0.49	0.13	1.23
T_5: Quizalofop ethyl 5% EC @ 60 g a.i./ha at 15 DAE + one hand weeding (21 DAE)	320.0	1.42	368.3	18.31	19.50	5.19	2.99	6.42
T_6: Butachlor 50% EC or 5% G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	355.0	1.65	422.6	21.01	21.79	0.16	0.29	0.41
T_7: Hand weeding twice (15 & 21 DAE)	325.0	1.34	369.3	18.36	18.89	4.02	0.22	1.01
T_8: Unweeded control	310.0	1.16	223.0	11.08	12.80	5.01	9.52	14.84
SEm±	3.47	0.09	32.5	1.96	1.4	0.13	0.26	0.68
$CD_{(P=0.05)}$	10.52	0.27	98.5	5.94	4.05	0.39	0.78	2.06

DAE: days after crop emergence * - pool of 2013 & 2014

Table 2.34 Yield attributes and fibre yield of sunnhemp under different weed control methods at Pratapgarh, Uttar Pradesh

Treatment	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)	
				2014	Pool *
T_1: Pretilachlor 50% EC @ 450ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	245.0	0.85	275.9	7.33	7.04
T_2: Pretilachlor 50% EC @ 900ml/ha at 45-48 hours of sowing with irrigation + one hand weeding (15 DAE)	248.4	0.89	282.4	7.60	7.54
T_3: Nail weeder – 1st at 5-6 DAE (at field capacity) and 2nd at 10 DAE + one hand weeding (within the row) at 15 DAE	260.6	0.99	321.1	8.91	8.03
T_4: Nail weeder at 5-6 DAE + scrapper at 15 DAE+ one hand weeding (within the row) at 15 DAE	263.4	1.01	326.5	9.14	8.40
T_5: Quizalofop ethyl 5% EC @ 60 g a.i./ha at 15 DAE + one hand weeding (21 DAE)	257.4	0.96	306.5	8.40	7.64
T_6: Butachlor 50% EC or 5% G @ 1.5 kg a.i./ha+ one hand weeding (15 DAE)	252.9	09.3	292.6	7.90	7.34
T_7: Hand weeding twice (15 & 21 DAE)	267.9	1.04	334.1	9.48	8.76
T_8: Unweeded control	242.2	0.83	270.7	7.07	6.70
T_8: Weed free check	273.6	1.09	366.2	10.47	9.57
SEm±	5.15	0.04	16.61	0.59	0.34
$CD_{(P=0.05)}$	15.45	0.13	49.8	1.76	0.98

DAE: days after crop emergence * - pool of 2013 & 2014

NP (JA) 7.11: Survey of weed incidence and its diversity in the different jute / mesta growing regions

The experiment was conducted at Barrackpore, Kendrapara and Katihar to study the weed incidence and weed diversity in the different jute / mesta growing regions. The centre-wise results are presented below.

Barrackpore : A total of 13 weed species comprised of four grasses, eight broad leaved weeds and one sedge weed were recorded in different jute growing areas of West Bengal (table 2.35). Among the grass weeds, *Echinochloa colonum* had the highest density (142 /m^2) and importance value index (IVI) (54.58 %) followed by *Eleusine indica*. Among the broad leaved weeds, *Physalis minima* had the highest density (148/m^2) and IVI (76 %) in experimental fields. *Cyperus rotundus* was the only sedge found in experimental fields with density of 31 plants/m^2 and IVI of 18.61. The trend of density and IVI of the aforesaid

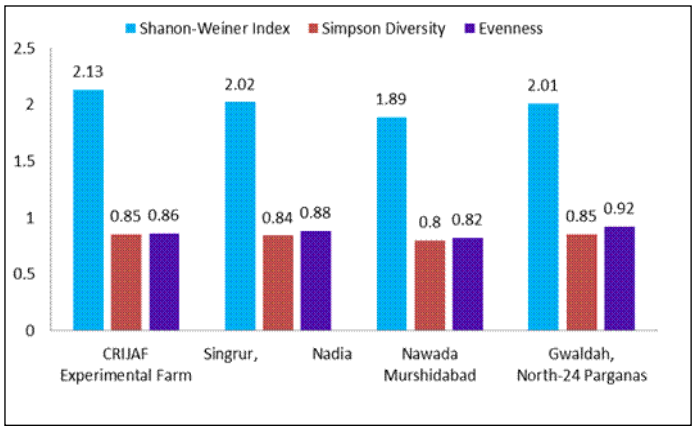


Fig. 1. Shanon-Weiner index, Simpson Diversity index (D) and Evenness of weeds in CRIJAF experimental farm and different blocks of West Bengal

weed species was same in Singur block of Nadia district. In Nawada block of Murshidabad, *Cyperus rotundus* had the highest density (62/m^2) and IVI (68.91 %) followed by *Trianthema portulacastrum* (density - 50 /m^2, IVI - 61.16%). In Gwaldah, *Echinochloa colonum* was the dominnant species with the highest density (58 /m^2) and IVI (59.71%) followed by *Trianthema portulacastrum.* Diversity indices of weeds were also varied with locations (Fig. 1). Shanon-Weiner index of weed species was found highest (2.13) at CRIJAF Farm followed by Singur (2.02) and Goaldah (2.01) blocks, respectively. Simpson diversity index also followed the same trend, whereas, species evenness was the highest (0.92) in Goaldah followed by Singur block (0.88).

Table 2.35 Weed composition and their Importance value index (IVI) in CRIJAF experimental Farm and different block of West Bengal

Weed species	CRIJAF Experimental farm		Farmers' field					
			Singur, Nadia		Nawada , Murshidabad		Goaldah 24 Parganas North	
	Weed density (No./m^2)	IVI (%)	Weed density (No./m^2)	IVI (%)	Weed density (No./m^2)	IVI (%)	Weed density (No./m^2)	IVI (%)
Grasses								
Echinochloa colonum (L.) Link	142	54.58	36	38.73	10	23.09	58	59.71
Eleusine indica Gaertn.	68	31.22	12	20.19	2	7.63	22	30.69
Digitaria sanguinalis (L.) Scop.	44	23.65	0	0	10	20.83	12	21.98
Brachiaria reptance (L.) Gard & C.E. Hubb.	14	11.34	0	0	9	18.52	0	0
Broad leaved								
Trianthema portulacastrum L.	20	16.07	40	45.05	50	61.16	42	53.22
Physalis minima l.	148	61.24	76	65.3	10	20.8	24	32.43
Phyllanthus niruri L.	40	22.38	24	29.26	0	0	10	20.24
Digera arvenses Forsk.	14	14.18	0	0	0	0	0	0
Amaranrhus viridis L.	16	13.15	6	13.05	10	20.8	6	14.19
Cleome viscosa L.	18	13.88	6	12.67	6	15.76	0	0
Portulaca oleracea L.	34	19.70	13	20.94	32	42.48	27	35.05
Celosia argentia	0	0.00	12	18.7	0	0	0	0
Sedge								
Cyperus rotundus L.	31	18.61	33	36.07	62	68.91	24	32.43

Kendrapara : A total of ten weed species comprised of four grasses, five broad leaved weeds and one sedges were recorded in different blocks of Kendrpara, Odisha (table 2.36). *Echinochloa colonum* was the dominant weed species among all the weeds in experimental farm as well as in

different blocks of Kendrapra. Among the broad leaved weeds, *Portulaca oleracea* was found to be the dominant one (density - 29/m^2, IVI-33.1%) followed by *Cleome viscosa* (density - 25.3, IVI - 30.3%) in the experimental farm while in farmers' fields, *Melochia corcorifolia* was the dominant weed at Kendrapara and Marsaghai blocks with IVI values of 29.54% and 27.4%, respectively. In Derabish and Mahanga Block, *Euphorbia hirata* was the dominant broad leaved weed with IVI of 22.6 and 19.2%, respectively. Diversity indices of weeds also varied with different locations. All the three species diversity indices were found to be higher in the experimental fields of JRS, Kendrapara as compared to the framers' fields in Kendrapara block (Fig. 2).

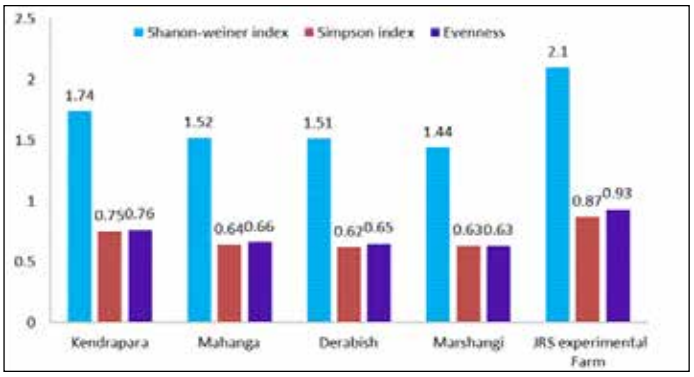


Fig. 2. Shanon-weiner index, Simpson Diversity index (D) and evenness of weeds in JRS experimental farm and different blocks of Odisha

Table 2.36 Weed composition and their Importance value index (IVI) in JRS Kendrapara experimental Farm and different block of Odisha

Weed Species	JRS Experimental farm		Farmers' field							
			Kendrapara		Derabish		Mahanga		Marsaghai	
	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)
Grasses										
Echinochloa colonum (L.) Link	48.0	47.8	110.7	97.28	89.0	142.9	114.0	126.8	132.3	117.4
Paspalam digitatum L.	22.0	27.7	6.3	13.42	5.3	12.5	8.7	19.9	3.0	13.5
Cynodon dactylon L.	34.3	37.3	30.0	34.47	13.7	19.5	14.7	26.0	27.7	33.3
Eleusine indica Gaertn.	41.0	42.4	5.7	12.89	8.3	20.4	4.0	11.8	1.0	5.3
Broad leaved										
Portulaca oleracea L.	29.0	33.1	15.3	23.05	9.3	11.1	7.3	18.6	12.3	21.0
Melochia corcorifolia L.	20.0	26.2	23.7	29.54	4.7	11.9	6.3	15.4	20.3	27.4
Cleome viscosa L.	25.3	30.3	13.3	21.49	1.0	15.5	5.7	14.0	6.3	16.2
Euphorbia hirata L.	0.3	4.1	23.3	29.28	19.3	22.6	8.0	19.2	12.0	15.9
Scoparia fulvis L.	11.7	19.7	8.7	17.86	4.7	20.7	3.7	14.8	9.7	17.1
Sedge										
Cyperus rotundus L.	26.7	31.3	12.3	20.71	15.7	22.9	22.0	33.4	27.0	32.8

Katihar : A total of 14 weed species comprised of 8 grasses, 5 broad leaved weeds and one sedges were recorded in the experimental farm and different blocks of Katihar, Bihar(table 2.37). *Cyperus rotundus* was the dominant weed species in the experimental farm and also in farmers' fields in all blocks of Katihar . Among the grass weeds, *Cynodon dactylon* was the dominant one, both in JRS experimental and farmers' fields in all the blocks of Katihar. Among the broad leaved weeds, *Phyllanthus niruri* and *Physalis minima* were dominant in JRS farm, whereas, *Cleome viscosa* was dominant in farmers, fields in Katihar.

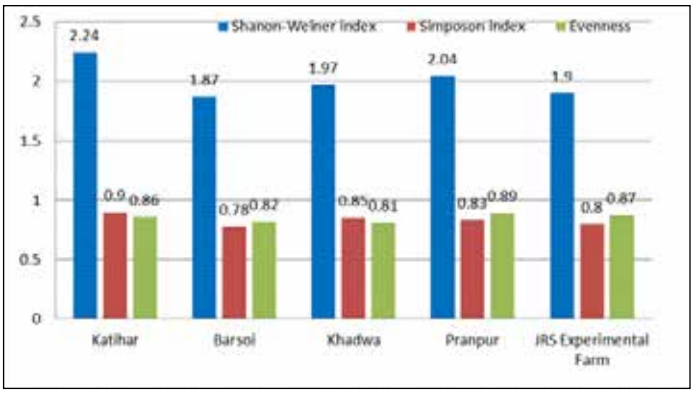


Fig. 3: Shanon-Weiner index, Simpson Diversity index and Evenness of weeds in JRS experimental farm and different blocks of Bihar

Table 2.37 Weed composition and their Importance Value Index (IVI) in JRS Katihar experimental farm and different blocks of Bihar

Weed species	JRS experimental Farm		Farmers field							
			Katihar		Barsoi		Khadwa		Pranpur	
	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)	Weed density (No/m^2)	IVI (%)
Grasses										
Cynodon dactylon L	10	46.54	2.00	15.82	12.67	51.99	9.67	53.0	8	44.64
Echinochloa colonum (L.) Link	6	32.50	3.67	23.71	2.33	17.73	2.00	19.17	3	23.20
Eleusine indica Gaertn.	4.25	26.35	5.00	28.81	3.67	22.15	1.67	17.70	2.34	20.35
Brachiaria reptance (L.), Gard & C.E. Hubb	0	0.00	0.00	0.00	2.00	16.63	1.67	17.70	3	23.20
Dactyloctenium aegyptium (L) Willd.	3.5	23.72	0.00	0.00	3.00	19.94	3.00	23.58	3	23.20
Setaria glauca (L.) Beauv.	3.75	24.60	0.67	8.06	0.00	0.00	0.00	0.00	0	0.00
Panicum repence L.	2.75	19.82	4.33	26.26	3.33	21.05	2.67	21.56	2.34	21.14
Paspalam digitatum	0	0.00	3.33	22.07	0.00	0.00	0.00	0.00	0	0.00
Broad leaved										
Cleome viscosa L	0	0.00	3.00	21.16	4.33	24.36	4.33	29.47	4.34	28.92
Phyllanthus niruri L.	2.75	21.09	2.67	19.88	2.67	18.84	2.67	22.11	2.67	21.78
Physalis minima L.	2.75	21.09	2.67	19.88	2.67	18.84	0.00	0.00	0	0.00
Amaranrhus viridis L.	0	0.00	3.00	21.16	0.00	0.00	0.00	0.00	0	0.00
Ageratum conyzoides L.	0	0.00	3.00	21.16	2.66	18.84	2.00	19.17	2	18.92
Sedge										
Cyperus rotundus L.	20.75	84.29	14.00	72.03	23.66	88.45	15.00	76.54	15	74.64

Diversity indices of weeds also varied with different locations . Shanon-weiner index and Simpson diversity of weed species was found highest (2.24, 0.90) in Katihar block followed by experimental farm (1.9, 0.80) while species evenness was highest (0.89) in Pranpur block followed by JRS Farm (0.87) (Fig. 3).

NP (JA) 7.12: Effect of date of sowing and spacing of jute on seed yield as influenced by topping management practices

The experiment was conducted at Coochbehar, Nagaon, Bahraich, Rahuri and Katihar to study the effect of date of sowing, spacing and topping on seed yield of *capsularis* and *olitorius* jute and the centre wise data are presented below:

Effect of management practices on seed yield of jute at Coochbehar

Coochbehar: The experimental data revealed that the sowing of *capsularis* jute seed crop on 3rd week of August recorded significantly higher number of productive branches/plant (11.2), number of pods/plant (112.6), 1,000-seed weight (3.32 g) over other sowing dates. The seed yield was highest with sowing on 3rd week of August (6.42 q/ha) but was not significantly different from other sowing dates (table 2.38). The effect of spacing on seed yield and yield attributing characters of jute was non-significant except in case of 1000 seed weight. Highest seed yield of *capsularis* jute (5.31 q/ha) was observed with 45 cm x 10 cm spacing while maximum number of productive branches/plant (9.7) and pods/plant (82.4) were observed with 60 cm 15 cm spacing. The 1,000-seed weight of jute was significantly higher with 45 cm x 15 cm spacing (3.27 g) as compared to 60 cm x 15 cm spacing. Change in topping date of the seed crop from 30 to 45 DAS did not bring any significant variation in number of productive branches/plant, number of pods/plant as well as in seed yield though the 1,000-seed weight value was significantly higher with topping at 30 DAS over 45 DAS (table 2.38).

Nagaon: Highest number of seeds/pod (31.7), 1,000-seed weight (3.76 g) and seed yield (5.58 q/ha) of *capsularis* jute was observed when the crop was sown on 6th July at Nagaon, Assam and the values decreased progressively with the further delay in sowing time upto 6th August. Similar trend was observed in seed yield of the crop when the data were pooled (table 2.39). Lowest seed yield was observed in August sown crop. However, the number of branches was significantly higher with August sown crop during 2014. Dates of sowing did not bring any significant variation in number of pods/plant of jute. Spacing did not have any significant influence on yield attributing characters as well as on seed yield of *capsularis* jute during 2014. The pooled data (from 2012 to 2014) revealed that the seed yield of jute decreased significantly when the row spacing was increased from 45 to 60 cm. In 2014, topping at 30 DAS recorded significantly higher seed yield of *capsularis* jute (4.33 q/ha) over topping at 45 DAS while the number of branches/plant was significantly higher when topping was done at 45 DAS (5.27). However, delaying the time of topping from 30 to 45 DAS did not bring any significant variation in number of pods, seeds/pod and 1000-seed weight of *capsularis* jute during 2014. Similar trend was observed for seed yield of *capsularis* jute in pooled data also (table 2.39).

Table 2.38 Effect of date of sowing, spacing and topping on yield attributes and seed yield of jute at Coochbehar, West Bengal

Treatments	Productive branches / plant	Pods/plant	1000 seed weight (g)	Seed yield (q/ha)
Date of sowing				
D_1: 21st July	7.5	49.1	3.19	4.13
D_2 : 6th August	8.2	71.7	3.25	5.27
D_3 : 21st August	11.2	112.6	3.32	6.42
SEm±	0.47	3.44	0.006	0.52
$CD_{(P=0.05)}$	1.8	13.50	0.02	NS
Spacing				
S_1 : 45cm x 10 cm	8.1	69.2	3.26	5.31
S_2 : 45 cm x 15 cm	8.9	81.8	3.27	5.24
S_3 : 60 cm x 15 cm	9.7	82.3	3.23	5.27
SEm±	0.82	5.24	0.005	0.24
$CD_{(P=0.05)}$	NS	NS	0.015	NS
Topping				
T_1 : 30DAS	8.9	78.7	3.26	5.33
T_2 : 45 DAS	9.0	76.9	3.24	5.22
SEm±	0.72	4.78	0.005	0.17
$CD_{(P=0.05)}$	NS	NS	0.014	NS

Table 2.39 Effect of date of sowing, spacing and topping on yield attributes and seed yield of jute at Nagaon, Assam

Treatments	Plant height (cm)	Branch / plant	Pods / plant	Seeds/pod	1000 seed weight (g)	Seed yield (q/ha)	
						2014	Pool*
Date of sowing							
D_1: 6th July	121.1	3.95	33.8	31.7	3.76	5.58	5.35
D_2 : 21st July	120.3	3.56	29.2	31.6	3.69	3.75	3.91
D_3 : 6th August	110.5	7.42	25.7	27.9	3.36	3.21	2.66
SEm±	2.53	0.42	1.86	0.72	0.07	0.34	0.19
$CD_{(P=0.05)}$	NS	1.6	NS	2.82	0.27	1.33	0.74
Spacing							
S_1 : 45cm x 10 cm	116.2	4.96	28.9	30.8	3.59	4.48	4.39
S_2 : 45 cm x 15 cm	113.9	4.70	29.2	30.9	3.63	4.16	4.15
S_3 : 60 cm x 15 cm	121.7	5.27	30.6	29.5	3.61	3.88	3.38
SEm±	2.56	0.21	1.21	0.64	0.10	0.23	0.08
$CD_{(P=0.05)}$	NS	NS	NS	NS	NS	NS	0.25
Topping							
T_1 : 30DAS	116.0	4.68	30.3	30.6	3.52	4.33	3.83
T_2 : 45 DAS	118.6	5.27	28.9	30.2	3.70	4.02	4.11
SEm±	0.80	0.15	0.71	0.42	0.09	0.08	0.02
$CD_{(P=0.05)}$	2.4	0.4	NS	NS	NS	0.24	NS

*Pool of 2012, 2013 and 2014

The interactions between date of sowing, spacing and time of topping on seed yield of jute was found to be significant when data were pooled for 2012, 2013 and 2014. The interaction between sowing date and spacing revealed that maximum seed yield of jute was achieved with sowing on 6th July with spacing of 45 cm x 10 cm (6.00 q/ha) which was statistically at par with 6th July sowing on 45 cm x 15 cm but significantly higher than seed yield with other combinations (table 2.40). Similarly, spacing of 45 cm x 10 cm with topping at 45 DAS recorded significantly higher seed yield of jute over other combinations (table 2.41). Thus it may be concluded that sowing of jute on 1st week of July with 45 cm x 10 cm row spacing and topping at 45 DAS will give maximum seed yield of the crop is recommended for Nagaon region of Assam.

Table 2.40 Interaction effect of date of sowing and spacing on seed yield of jute at Nagaon, Assam (pool of 2012, 2013 & 2014)

Date of sowing	Seed yield (q/ha)		
	Spacing		
	S_1 : 45 cm x 10 cm	S_2 : 45 cm x 15 cm	S_3 : 60 cm x 15 cm
D_1: 6th July	6.00	5.84	4.21
D_2 : 21st July	4.43	3.94	3.35
D_3 : 6th August	2.74	2.64	2.57
SEm±	0.14		
$CD_{(P=0.05)}$	0.43		

Table 2.41 Interaction effect of spacing and topping of seed yield on seed yield of jute at Nagaon, Assam (pool of 2012, 2013 & 2014)

Spacing	Seed yield (q/ha)	
	Time of topping	
	T_1 : 30DAS	T_2 : 45DAS
S_1 : 45 cm x 10 cm	4.15	4.63
S_2 : 45 cm x 15 cm	4.03	4.25
S_3 : 60 cm x 15 cm	3.31	3.45
SEm±	0.03	
$CD_{(P=0.05)}$	0.09	

Bahraich: Sowing of seed crop of *capsularis* jute at 15th June recorded maximum number of productive branches (15.5), pods/plant (117.8), 1000-seed weight (3.83 g) and seed yield (6.16 q/ha) of the crop at Bahraich, Uttar Pradesh and the yield declined significantly with further delay in sowing. Similar trend was observed in pooled data also. Number of productive branches/ plant, pods/plant and seed yield were not significantly influenced by spacing or time of topping. In 2014, spacing of 60 cm x 15 cm or topping at 45 DAS recorded significantly higher 1000 seed weight of jute (table 2.42). Similarly, the pooled data of 2012 to 2014 revealed that seed yield was significantly influenced by spacing with maximum yield recorded in highest spacing (60 cm x 15 cm) while the effect of topping time was non-significant at Bahraich, Uttar Pradesh (table 2.42). Thus sowing of jute seed crop on 1st fortnight of June with spacing of 45 cm X 10 cm and topping on 30 or 45 days after sowing is recommended for achieving higher seed yield of the crop at Bahraich region of UttarPradesh.

Table 2.42 Effect of date of sowing, spacing and topping on yield attributes and seed yield of jute at Bahraich, Uttar Pradesh

Treatments	Yield attributes of jute				Seed yield (q/ha)	
	Plant height (cm)	Number of productive branches / plant	Number of pods / plant	1000 seed weight (g)	2014	Pool*
Date of sowing						
D_1: 15th June	180.3	15.5	117.8	3.83	6.16	6.15
D_2: 01st July	178.0	14.6	110.7	3.53	5.61	5.77
D_3: 16th July	172.0	11.5	106.1	3.35	5.09	4.55
SEm±	0.30	0.34	0.96	0.01	0.11	0.04
$CD_{(P=0.05)}$	1.2	1.3	3.8	0.03	0.43	0.16
Spacing						
S_1 : 45 cm X 10 cm	175.3	13.7	111.2	3.51	5.65	5.42
S_2 : 45 cm X15 cm	177.7	13.9	110.9	3.57	5.59	5.49
S_3 : 60 cm X 15 cm	178.3	14.0	112.5	3.64	5.63	5.56
SEm±	0.45	0.33	0.69	0.01	0.19	0.01
$CD_{(P=0.05)}$	1.3	NS	NS	0.03	NS	0.03
Topping						
T_1 : 30DAS	176.7	13.9	111.0	3.55	5.63	5.45
T_2 : 45DAS	176.8	13.8	112.1	3.59	5.62	5.53
SEm±	0.78	0.58	1.21	0.12	0.03	0.01
$CD_{(P=0.05)}$	NS	NS	NS	0.36	NS	NS

*Pool of 2012, 2013 and 2014

Rahuri: Maximum number of branches/plant (24.0), number of pods/plant (107.7) and seed yield (26.83 q/ha) of *olitorius* jute were observed when the crop was sown on 10th June, and the value of yield attributes and seed yield of decreased significantly with further delay in sowing upto 10th July (table 2.43). Significantly higher number of branches/plant (22.5) and pods/plant (120.9) were recorded with spacing of 60 cm x 30 cm over other other spacing while 60 cm x 15 cm spacing recorded significantly higher seed yield (22.27 q/ha) over the rest spacing treatments. Topping at

Effect of management practices on seed yield of jute at Rahuri

30 DAS resulted into significantly higher number of branches/plant (21.4), number of pods/plant (105.6) and seed yield (22.45 q/ha) of *olitorius* jute over no topping and topping at 45 DAS at Rahuri, Maharashtra. The interactions between date of sowing, spacing and time of topping on seed yield of jute was found to be significant at Rahuri, Maharashtra in 2014. The interaction between sowing date and spacing revealed that maximum seed yield of jute was achieved with sowing on 10th June with spacing of 60 cm x 15 cm (28.74 q/ha) while a combination of 10th June sowing and topping on 30 DAS recorded highest seed yield (29.54 q/ha) of the crop at Rahuri (tables 2.44 & 2.45).

Table 2.43 Effect of date of sowing, spacing and topping on yield attributes and seed yield of jute at Rahuri, Maharashtra

Treatments	Plant height (cm)	Branches/plant	Pods/plant	Seed yield(q/ha)
Date of sowing				
D_1 : 10th June	267.2	24.0	107.7	26.83
D_2 : 30th June	250.3	21.4	88.5	19.60
D_3 : 10th July	186.1	15.6	92.5	16.88
SEm±	2.96	0.45	1.28	0.48
$CD_{(P=0.05)}$	11.6	1.76	5.02	1.88
Spacing				
S_1 : 45cm x 15 cm	233.1	16.4	63.9	21.05
S_2 : 45 cm x 30 cm	234.0	21.4	103.1	20.20
S_3 : 60 cm x 15 cm	235.2	20.9	97.0	22.27
S_4 : 60 cm x 30 cm	235.8	22.5	120.9	20.90
SEm±	0.94	0.31	1.95	0.43
$CD_{(P=0.05)}$	NS	0.90	5.79	1.27
Topping				
T_1 : No topping	241.3	18.6	86.4	19.83
T_2 : 30 DAS	222.8	21.4	105.6	22.45
T_3 : 45 DAS	239.5	20.9	96.7	21.04
SEm±	1.32	0.24	1.42	0.27
$CD_{(P=0.05)}$	2.6	0.68	4.04	0.77

Katihar: Maximum number of branches/plant (5.1), pods/plant (34.1) and seed yield (4.13 q/ha) of *olitorius* jute was recorded with 21st July sowing and the yield declined significantly thereafter (table 2.46). However, date of sowing did not have any significant influence on number of branches and pods per plant. Wider spacing of 60 cm x 15 cm resulted in significantly higher number of branches/plant (5.15) compared to closer spacing while closer spacing (45 cm x 10 cm or 45 cm x 15 cm) recorded significantly higher seed yield (4.58 – 4.82 q/ha) over wider one. However, spacing did not have any significant effect on number of pods/plant Yield attributing characters and seed yield of *olitorius* jute were not significantly influenced by topping at 30 or 45 DAS at Katihar, Bihar.

NP 2.44 Interaction effect of date of sowing and spacing on seed yield of jute at Rahuri, Maharashtra (2014)

Date of sowing	Seed yield (q/ha)			
	S_1 : 45 cm x 15 cm	S_2 : 45 cm x 30 cm	S_3 : 60 cm x 15 cm	S_4 : 60 cm x 30 cm
D_1: 10th June	26.55	25.61	28.74	26.43
D_2 : 30th June	17.93	19.19	22.16	19.13
D_3 : 10th July	18.68	15.80	15.92	17.15
SEm±	0.76			
$CD_{(P=0.05)}$	2.25			

Table 2.45 Interaction effect of date of sowing and topping time on seed yield of jute at Rahuri, Maharashtra

Date of sowing	Seed yield (q/ha)		
	T_1 : No topping	T_2 : 30 DAS	T_3 : 45 DAS
D_1: 10th June	24.02	29.54	26.93
D_2 : 30th June	18.84	20.41	19.56
D_3 : 10th July	16.62	17.40	16.64
SEm±	0.48		
$CD_{(P=0.05)}$	1.36		

Table 2.46 Effect of date of sowing, spacing and topping on yield attributes and seed yield of jute at Katihar, Bihar

Treatments	Branches / plant	Pods / plant	Seed yield(q/ha)
Date of sowing			
D_1: 21st July	5.0	34.1	5.41
D_2 : 6th August	4.9	29.3	4.58
D_3 : 21st August	4.0	24.3	3.85
SEm±	0.21	1.91	0.22
$CD_{(P=0.05)}$	NS	NS	0.86
Spacing			
S_1 : 45cm x 10 cm	4.2	27.1	4.82
S_2 : 45 cm x 15 cm	4.6	30.0	4.58
S_3 : 60 cm x 15 cm	5.1	30.7	4.17
SEm±	0.22	2.27	0.09
$CD_{(P=0.05)}$	0.6	NS	0.27
Topping			
T_1 : 30DAS	4.4	28.4	4.36
T_2 : 45 DAS	4.9	30.1	4.69
SEm±	0.29	1.46	0.11
$CD_{(P=0.05)}$	NS	NS	NS

NP (JA) 7.14: Evaluation of CRIJAF microbial consortium in jute / mesta

The experiment was conducted with an objective to find out the efficiency of CRIJAF microbial consortium in jute and mesta retting under various agro-climatic condition. The talc based formulation of microbial consortium "CRIJAF SONA" supplied by CRIJAF was tested in different AINP centres. The trials were conducted at Barrackpore, Bahraich, Kalyani, Katihar, Kendrapara, Nagaon and Amadalavalasa centres, results of which are presented below:

Barrackpore: Two retting trials were conducted in cemented retting tank during first week of August with CRIJAF microbial formulation. The same set of retting trial was also conducted in separate cemented retting tank without CRIJAF microbial formulation. The retting with microbial formulation was completed in 13 days compared to 22 days without microbial consortium with improvement in fibre quality (table 2.47) as indicated by fibre strength of 24.8-26.7 g/tex compared to 21.2-22.3 g/tex recorded in control plot. The retting water samples were analyzed for total cfu, pectin and xylan degrading microbes. The total microbial population as well as pectin and xylan degraders were much higher in retting water treated with microbial consortium compared to water of control treatment after completion of retting, which might have helped in the quicker retting of jute in the treated plots (table 2.47).

Table 2.47 Effect of CRIJAF microbial formulation on jute retting and microbial status in retting water at CRIJAF, Barrackpore

Treatments	Trials	Retting duration (days)	Fibre strength (g/tex)	Total microbes (cfu)	Pectin degraders (cfu)	Xylan degraders (cfu)
Retting with CRIJAF microbial formulation	Trial No.1	13	24.8	45×10^8	17×10^8	23×10^8
	Trial No.2	13	26.7	39×10^8	15×10^8	20×10^8
Retting without CRIJAF microbial formulation	Trial No.1	22	21.2	55×10^4	26×10^3	33×10^3
	Trial No.2	21	22.3	49×10^4	22×10^3	30×10^3

Kalyani: The retting trial was conducted in cemented retting tank during fourth week of August using two sets of jute plants (cv. JRO 524) with and without CRIJAF microbial formulation. The retting with microbial formulation was completed in 12 days compared to 19 days without microbial formulation with improvement in fibre quality. The jute fibre obtained with microbial formulation recorded fibre strength of 26.5 g/tex compared to 22.8 g/tex recorded with untreated fibre (table 2.48).

Table 2.48 Effect of CRIJAF microbial formulation on jute retting at Kalyani

Treatments	Retting duration (days)	Fibre strength (g/tex)
Retting with CRIJAF microbial formulation	12	26.5
Retting without CRIJAF microbial formulation	19	22.8

Jute fibre retted with CRIJAF Sona

Bahraich: The Retting trial was conducted for jute crop during the month of August and the retting was completed in 10 and 15 days respectively with and without formulation. The EC and TDS of retting water at harvest was increased by more than 2 times compared to initial value.

Nagaon: The retting trial on jute was conducted in polythene lined retting tank during third week of September with CRIJAF microbial formulation. The same set of retting trial was also conducted in separate polythene lined retting tank without CRIJAF microbial formulation. The retting with microbial formulation was completed in 21.2 days compared to 30.2 days under without CRIJAF microbial formulation (table 2.49). The continuous rainfall and lower temperature during retting period resulted in delay in completion of retting. The EC and TDS of retting water increased 2 to 3 times after completion retting with and without microbial formulation.

Table 2.49 Changes in Physico-chemical properties of jute retting water, retting duration and fibre strength at Nagaon

Physico-chemical properties	With CRIJAF microbial formulation		Without CRIJAF microbial formulation	
	Before retting	After retting	Before retting	After retting
EC (mmhos)	480.8	1269.8	497.4	1258.2
TDS (ppm)	419.7	839.2	359.6	1046.6
Temperature (^{0}C)	31.4	32.9	31.7	32.1
Retting duration (days)	21.2		30.2	
Fibre strength (g/tex)	23.5		19.2	

Kendrapara: The retting trial was conducted in separate retting tanks with and without CRIJAF microbial formulation. Retting of jute with microbial formulation was completed in 15 days compared to 21 days taken for retting in absence of CRIJAF microbial formulation. The treated fibre was golden white in colour compared to greyish colour observed in untreated fibre.

Katihar: The retting trial on jute was conducted in separate retting tank with and without CRIJAF microbial formulation. The jute retting with CRIJAF microbial formulation was completed in 13 days compared to 17 days taken for completion of retting in untreated tank.

Amadalavalasa: The retting trial was conducted with two sets of mesta plants, one set treated with CRIJAF microbial formulation and another without microbial formulation in separate cemented retting tanks. The mesta retting with microbial formulation was completed in 9 days compared to 15 days required without microbial formulation. The EC, TDS and salt content of retting water increased several times at the end of retting with and without microbial formulation although, retting water with microbial formulation recorded higher values of the said parameters compared to water of control treatment (table 2.50).

The efficacy of CRIJAF microbial consortium had been tested in different AINP centers for jute and mesta retting since 2011. Initially liquid consortium was used for retting and talc based formulation of microbial consortium was used thereafter for retting. CRIJAF, Bahraich, Kalyani and Amadalavalasa centers had conducted the trials consecutively for four years since 2011. In these centres, retting with microbial formulation, completed in 8 to 14 days whereas, retting without formulation completed in 15 to 21 days, thereby indicating a reduction in retting duration by 6 to 7 days. The fibre strength also increased by 3 to 4 g/tex with microbial formulation compared to conventional retting besides improvement in colour and lusture. In Nagaon and Kendrapara centers, the trials were conducted for last three years (2012-2014) and the reduction in retting duration was by 9-10 at Nagaon and by 6 days at Kendrapara with the use of CRIJAF microbial consortium compared to conventional retting. The formulation had been tried in Katihar and

Aduthurai centres for two years and reduction in retting duration by 4 to 5 days and 6 to 8 days were reported in these centers with use of microbial formulation. The CRIJAF microbial formulation had also been tested under the Tribal Sub Plan programme of AINP at Kalyani, Nagaon and Kendrapara centres under farmers' field condition with similar reduction in retting duration and improvement in fibre quality. Thus use of CRIJAF microbial formulation "CRIJAF SONA" may be recommended in West Bengal, Bihar, Odisha, Assam, Uttar Pradesh and Andhra Pradesh for faster retting of jute and mesta with improvement in fibre quality.

Table 2.50 Effect of CRIJAF microbial formulation on physico-chemical properties of jute retting water and retting duration at Amadalavalasa, Andhra Pradesh

Physico-chemical properties	With CRIJAF microbial formulation		Without CRIJAF microbial formulation	
	Before retting	After retting	Before retting	After retting
pH	7.56	7.64	7.85	8.12
EC (mmhos)	685	732	656	816
TDS (ppm)	438	520	409	642
Salts (ppm)	235	435	225	452
Temperature (^{0}C)	27.4	26.4	27.8	26.2
Retting duration (days)	08		14	

NP(JA)7.16 (modified): Risk management in jute / mesta cultivation through jute/mesta and pulse strip cropping

The experiment was conducted at Amadalavalasa but the experiment failed due to heavy downpour during *HudHud* Cyclone.

Mesta

NP(MA)1.0: Performance of new roselle genotypes under different fertilizer management schedules

The trial was conducted at Aduthurai and Amadalavalasa centres with an objective to determine the performance of new roselle genotypes and to develop suitable fertilizer schedule for them. The results obtained are summarized below:

Aduthurai: The experimental data revealed that the variation in fibre yield among the roselle entries and the check variety AMV 5 was non-significant (table 2.51). However, AMV 5 recorded significantly higher plant height (237.1 cm) and basal diameter (1.21 cm) over both the test entries. The basal diameter and fibre yield of roselle increased significantly upto NPK dose of 80:17.5:33.3 kg/ha level. Maximum value of plant height was recorded with highest fertilizer dose which was significantly superior to 60:13.2: 25 kg/ha level. Though there was not much variation in net return or B:C ration within the entries, the profitability, i.e. net return and B:C ratio increased with increase in fertilizer dose (table 2.52).

Performance of new roselle genotypes at Aduthurai

Table 2.51 Yield attributes and fibre yield of new roselle genotype under different fertilizer management schedules at Aduthurai, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
Variety			
V_1 : JBRP 01	223.0	1.14	22.45
V_2 : AHS 216	229.1	1.17	23.05
V_3 : AMV 5*	237.1	1.21	22.20
SEm±	1.01	0.01	0.39
$CD_{(P=0.05)}$	3.02	0.03	NS
Fertilizer schedule			
F_1 : 40: 8.7: 16.7	226.2	1.07	21.15
F_2 : 60: 13.: 25	229.2	1.16	22.52
F_3 : 80: 17.5: 33.3	233.7	1.29	24.03
SEm±	1.01	0.01	0.39
$CD_{(P=0.05)}$	3.02	0.03	1.17

*- check variety; Fertilizer - (N: P: K kg/ha)

Table 2.52 Economics of roselle genotypes at different fertilizer levels at Aduthurai , Tamil Nadu

Treatments	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B: C ratio
Variety				
V_1 : JBRP 01	21863	50515	28652	2.31
V_2 : AHS 216	21863	50910	29047	2.33
V_3 : AMV 5*	21863	51338	29474	2.35
Fertilizer schedule				
F_1 : 40: 8.7: 16.7	21160	47598	26438	2.25
F_2 : 60: 13.: 25	21860	50678	28818	2.32
F_3 : 80: 17.5: 33.3	22570	54078	31508	2.40

*- check variety;

Amadalavalasa: The variation in fibre yield and yield attributing characters among the roselle genotypes (test entry and check variety) were non-significant. Similarly, the effect of fertilizer was found significant only in case of plant height and basal diameter and the increase in both the parameter were significant only upto 60:13.2:25 kg NPK/ha level only (table 2.53).

Table 2.53 Yield attributes and fibre yield of new roselle genotype under different fertilizer management schedules at Amadalavalasa

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1 : JBRP-01	287.0	1.68	227.3	12.58
V_3 : AHS-216	292.1	1.56	216.8	11.45
V_3 : AMV-5*	298.3	1.54	187.1	10.01
SEm±	4.99	0.04	19.01	1.32
$CD_{(P=0.05)}$	NS	NS	NS	NS
Fertilizer schedule				
F_1: 40: 8.7: 16.	263.5	1.47	188.7	10.08
F_2 : 60: 13.2: 25	306.6	1.61	215.2	11.51
F_3 : 80: 17.5: 33.3	307.2	1.71	227.3	12.44
SEm±	4.99	0.04	19.01	1.32
$CD_{(P=0.05)}$	14.9	0.12	NS	NS

*- check variety; Fertilizer - (N: P: K kg/ha)

NP(MA)1.2: Performance of new kenaf genotypes under different fertilizer management schedules

The trial was conducted at Bamra, Amadalavalasa and Kendrapara centres with an objective to determine the performance of new kenaf genotypes and to develop suitable fertilizer schedule for them. The results obtained are summarized below:

Bamra: The experimental data revealed that variation in plant height and fibre yield among the varieties was found non-significant while maximum value of basal diameter was recorded with check variety (HC 583) which was significantly higher than the diameter of the test variety (JBMP 2). Plant height and fibre yield of kenaf increased significantly with increase in fertilizer application and maximum height (315.4 cm) and fibre yield (29.53 q/ha) were recorded with highest fertilizer dose, i.e. 80:17.5:33.3 (kg/ha) of NPK at Bamra, Odisha (table 2.54). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

Performance of new kenaf genotypes at Bamra

Kendrapara: The perusal of data revealed that effect of variety on plant height, basal diameter and fibre yield of kenaf genotypes were

non-significant. Application of fertilizer increased basal diameter and fibre yield of kenaf and the increase was significant upto 60:13.2:25 kg NPK/ha level only at Kendrapara, Odisha (table 2.55). The effect of fertilizer on plant height was found non-significant. The interaction effect of variety and nitrogen on yield and yield attributing characters was non-significant. Maximum net return and B:C ratio was recorded with test variety JBMP 1 (₹ 41633/ha, 1.88) and also with fertilizer level of 60:13.2:25 kg NPK/ha (₹ 42479/ha, 1.93) (table 2.56).

Table 2.54 Performance of new kenaf genotypes under different fertilizer management schedules at Bamra, Odisha

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
Variety			
V_1 : JBMP-1	291.8	2.25	25.30
V_2 : JBMP-2	277.4	2.21	25.21
V_3 : HC-583*	285.2	2.41	25.17
SEm±	4.05	0.06	0.40
$CD_{(P=0.05)}$	NS	0.18	NS
Fertilizer schedule			
F_1 : 40: 8.7: 16.7	257.1	2.22	20.72
F_2 : 60: 13.2: 25	282.0	2.30	25.44
$F_{3:}$ 80: 17.5: 33.3	315.4	2.35	29.53
SEm±	4.05	0.06	0.40
$CD_{(P=0.05)}$	12.1	NS	1.19

*- check variety; Fertilizer - (N: P: K kg/ha)

Table 2.55 Performance of new kenaf genotypes under different fertilizer management schedules at Kendrapara, Odisha

Treatments	Plant height (cm)	Basal diameter (cm)	Plant population (lakh/ha)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety					
V_1 : JBMP-1	377.5	2.04	3.3	739.3	33.50
V_2 : JBMP-2	357.1	1.89	3.3	648.1	30.20
V_3 : HC-583*	368.4	2.04	3.2	703.7	32.64
SEm±	7.60	0.04	0.03	30.2	1.41
$CD_{(P=0.05)}$	NS	NS	NS	NS	NS
Fertilizer schedule					
F_1 : 40: 8.7: 16.7	354.5	1.89	3.3	620.3	29.02
F_2 : 60: 13.2: 25	378.2	2.07	3.3	747.5	33.97
$F_{3:}$ 80: 17.5: 33.3	370.3	2.00	3.3	723.3	33.36
SEm±	7.60	0.04	0.03	30.2	1.41
$CD_{(P=0.05)}$	NS	0.12	NS	90.5	4.23

*- check variety; Fertilizer - (N: P: K kg/ha)

Table 2.56 Economics of kenaf genotypes under different fertilizer management schedules at Kendrapara, Odisha

Treatments	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B:C ratio
Variety				
V_1 : JBMP-1	22015	63648	41633	1.88
V_2 : JBMP-2	22015	57380	35365	1.61
V_3 : HC-583*	22015	62024	40009	1.82
Fertilizer schedule				
F_1 : 40: 8.7: 16.7	20875	55138	34263	1.64
F_2 : 60: 13.2: 25	22060	64539	42479	1.93
$F_{3:}$ 80: 17.5: 33.3	23110	63376	40266	1.74

*- check variety

Amadalavalasa: The test entry JBMP 2 recorded significantly higher plant height (218.6 cm), green weight (135.4 q/ha) and fibre yield (9.31 q/ha) over the test variety, HC 583. Increase in fertilizer doses increased plant height, green biomass and fibre yield significantly upto 60:13.2:25 kg/ha level only (table 2.57). The interaction effect of variety and nitrogen on yield and yield attributing character was non-significant.

Table 2.57 Performance of new kenaf genotypes under different fertilizer management schedules at Amadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1 : JBMP-1	194.0	1.46	95.6	6.76
V_2 : JBMP-2	218.6	1.52	135.4	9.31
V_3 : HC 583*	190.4	1.44	85.9	6.08
SEm±	2.47	0.05	8.95	0.63
$CD_{(P=0.05)}$	7.4	NS	26.8	1.89
Fertilizer schedule				
F_1 : 40: 8.7: 16.7	195.6	1.39	85.9	6.00
F_2 : 60: 13.2: 25	206.8	1.52	118.8	8.47
F_3 : 80: 17.5: 33.3	200.5	1.50	108.2	7.66
SEm±	2.47	0.05	8.95	063
$CD_{(P=0.05)}$	7.4	NS	26.8	1.89

*- check variety

NP(MA)3.1: Paper pulp qualities of mesta varieties under different nitrogen levels

The experiment was conducted at Bamra, Amadalavalasa and Aduthurai with an objective to determine the paper pulp quality of mesta varieties at different nitrogen levels. The results are summarized below:

Bamra: The experimental data revealed that mesta variety MT 150 recorded significantly higher green biomass (410.6 q/ha) over other varieties while basal diameter of MT 150 (2.04 cm) was statistically at par with that of JBM 2004 D (2.09 cm) but significantly higher the diameter of AMV 5 (1.83 cm). Plant height, basal diameter and green biomass of mesta increased progressively with increase in nitrogen dose and highest nitrogen dose, i.e., 160 kg N/ha recorded significantly higher values of all the parameters except biomass in 2014 over other nitrogen treatments (table 2.58). The interaction of variety and nitrogen revealed that maximum biomass (481.5 q/ha) was accumulated by variety MT 150 at 160 kg N/ha level which was statistically at par with that at 120 kg N/ha level (462.6 q/ha) but significantly superior to biomass accumulated by other varieties at all levels of applied nitrogen (table 2.58.). The pooled data of 2013 and 2014 revealed that MT 150 recorded significantly higher biomass over other varieties and the biomass yield increased significantly with increase in nitrogen level, maximum value (452.9 q/ha) being recorded with highest nitrogen dose (160 kg N/ha). The interaction of variety and nitrogen when pooled revealed that MT 150 receiving 160 kg N/ha recorded significantly higher biomass at Bamra, Odisha (table 2.59).

Table 2.58 Performance of mesta varieties at different nitrogen level at Bamra, Odisha

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	
Variety				
V_1 : JBM 2004 D	262.0	2.09	389.7	394.9
V_2 : MT 150	271.4	2.04	410.6	413.3
V_3 : AMV 5	264.5	1.83	382.8	383.6
SEm±	3.33	0.03	4.14	2.65
$CD_{(P=0.05)}$	NS	0.09	12.1	7.5
Nitrogen				
N_1 : 40 kg N/ha	229.2	1.86	323.6	322.1
N_2 : 80 kg N/ha	253.0	1.96	376.8	382.6
N_3 : 120 kg N/ha	276.7	2.00	433.5	431.2
N_4 : 160 kg N/ha	305.0	2.12	443.6	452.9
SEm±	3.84	0.04	4.78	3.06
$CD_{(P=0.05)}$	11.3	0.12	14.0	8.7

*-pool of 2013 and 2014

Table 2.59 Interaction effect of variety and nitrogen levels of mesta at Bamra, Odisha

Variety	Green biomass (q/ha)							
	Nitrogen levels							
	N_1 : 40 kg N/ha		N_2 : 80 kg N/ha		N_3 : 120 kg N/ha		N_4 : 160 kg N/ha	
	2014	Pool*	2014	Pool*	2014	Pool*	2014	Pool*
V_1 : JBM 2004 D	322.8	311.6	387.5	386.1	462.6	430.5	469.6	451.3
V_2 : MT 150	338.5	327.0	376.3	392.4	399.0	452.0	417.5	481.5
V_3 : AMV 5	309.6	327.6	366.8	369.4	439.0	411.1	443.6	426.1
SEm±	8.28							
$CD_{(P=0.05)}$	24.2							

* - pool of 2013 & 2014

Amadalavalasa: The experimental data revealed that among the three mesta varieties, AMV 5 recorded significantly higher plant height (327.6 cm) and green biomass (360.0 q/ha) over others while maximum basal diameter was recorded with JBM 2004 D (1.84 cm) at Amadalavalasa. Significantly higher green biomass of AMV 5 over other varieties was also recorded in pooled data (table 2.60). Among the parameters under study, only green biomass was significantly influenced by nitrogen application. In 2014, highest green biomass was recorded with 60 kg N/ha (275.3 q/ha) and it decreased significantly with further addition of nitrogen while in pooled data, nitrogen application increased green biomass significantly upto 80 kg/ha level (391.1 q/ha) beyond which it decreased significantly (table 2.60). The interaction of variety and nitrogen revealed that maximum biomass (442.7 q/ha) was accumulated by variety AMV 5 at 60 kg N/ha level which was significantly superior to biomass accumulated by varieties at all other levels of applied nitrogen (table 2.61).

Table 2.60 Performance of mesta varieties with different nitrogen levels at Amadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	
			2014	Pool*
Variety				
V_1 : JBM 2004 D	210.3	1.84	166.9	317.3
V_2 : MT 150	206.9	1.33	177.1	318.5
V_3 : AMV 5	327.6	1.55	360.0	390.0
SEm±	8.03	0.01	6.7	6.51
$CD_{(P=0.05)}$	23.5	0.03	19.6	21.2
Nitrogen				
N_1 : 40 kg N/ha	253.2	1.48	275.3	317.4
N_2 : 80 kg N/ha	247.1	1.70	237.4	391.1
N_3 : 120 kg N/ha	251.1	1.60	229.2	352.1
N_4 : 160 kg N/ha	241.7	1.51	196.7	307.0
SEm±	9.27	0.02	7.8	8.74
$CD_{(P=0.05)}$	NS	0.06	22.9	25.1

* - pool of 2013 & 2014

Table 2.61 Interaction effect of variety and nitrogen doses of mesta at Amadalavalasa (2014)

Variety	Green biomass (q/ha)			
	Nitrogen levels			
	N_1 : 40 kg N/ha	N_2 : 80 kg N/ha	N_3 : 120 kg N/ha	N_4 : 160 kg N/ha
V_1 : JBM 2004 D	190.4	165.0	158.9	153.4
V_2 : MT 150	192.7	185.5	172.3	157.7
V_3 : AMV 5	442.7	361.6	356.4	279.1
SEm±	13.50			
$CD_{(P=0.05)}$	39.5			

Aduthurai: The experimental data revealed that green biomass accumulated by JBM 2004 D (589.7 q/ha) was statistically at par with biomass produced by AMV 5 (382.3 q/ha) though the former variety recorded significantly higher plant height over other varieties. However, no significant variation was observed in basal diameter of the three varieties (table 2.62). The interaction of variety and nitrogen revealed that maximum biomass (729.3 q/ha) was accumulated by variety JBM 2004 D at 160 kg N/ha level which was significantly superior to biomass accumulated by all the varieties at all levels of applied nitrogen (table 2.63). The pooled data revealed that JBM 2004 D recorded significantly higher green biomass over other varieties. Plant height, basal diameter and green biomass of mesta increased significantly with application of nitrogen and maximum value of all the parameters were recorded with highest nitrogen dose. Thus cultivation of JBM 2004 D with nitrogen dose of 160 kg /ha may be recommended for cultivation of mesta for higher biomass generation for paper pulp purpose in Aduthurai region of Tamil Nadu.

Table 2.62 Performance of mesta varieties at different nitrogen level at Aduthurai, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	
			2014	Pool*
Variety				
V_1 : JBM 2004 D	281.7	1.27	589.7	687.5
V_2 : MT 150	277.7	1.22	520.2	601.5
V_3 : AMV 5	234.2	1.17	582.3	774.2
SEm±	0.84	0.09	3.85	4.21
$CD_{(P=0.05)}$	2.5	0.26	11.3	13.7
Nitrogen				
N_1 : 40 kg N/ha	256.7	1.11	489.8	649.4
N_2 : 80 kg N/ha	262.0	1.18	518.2	672.0
N_3 : 120 kg N/ha	266.6	1.27	542.1	699.3
N_4 : 160 kg N/ha	272.8	1.31	572.7	730.3
SEm±	0.98	0.01	4.45	4.97
$CD_{(P=0.05)}$	2.9	0.03	13.0	14.2

* - pool of 2013 & 2014

Table 2.63 Interaction effect of variety and nitrogen doses on biomass production of mesta at Aduthurai, Tamil Nadu

Variety	Green biomass (q/ha)			
	Nitrogen levels			
	N_1 : 40 kg N/ha	N_2 : 80 kg N/ha	N_3 : 120 kg N/ha	N_4 : 160 kg N/ha
V_1 : JBM 2004 D	653.4	676.5	699.6	729.3
V_2 : MT 150	460.6	503.0	532.4	584.7
V_3 : AMV 5	355.6	375.0	394.4	404.1
SEm±	7.71			
$CD_{(P=0.05)}$	22.6			

NP (MA) 3.4: To study the effect of date of sowing, spacing of mesta on seed yield as influenced by topping management practices

The experiment was conducted at Aduthurai, Kendrapara and Amadalavalasa to study the effect of date of sowing, spacing and topping on seed yield of mesta and the centre wise results are presented below:

Aduthurai: Sowing of mesta seed crop on 15th May recorded significantly higher number of branches/plant (14.87) and number of pods/plant (27.88) over 30th May or other sowing dates while the 1000 seed weight and seed yield of the crop did not differ significantly between 15th May and 30th May sowing. The pooled data of 2013 and 2014 revealed that maximum seed yield of mesta was recorded with 15th May sowing (9.16 q/ha) which was significantly higher than yield with other sowing dates (table 2.64). Maximum number of seeds/pod was recorded with 30th May sowing (24.3) which was significantly higher over all other sowing dates except 15th May sowing. Wider spacing of 60 cm x 10 cm recorded significantly higher number of pods/plant (19.2) and 1000 seed weight (24.31 g) over other spacing though it was statistically at par with 45 cm x 10 cm spacing with respect of branches/plant, seeds/pod as well as seed yield of the crop. Similar trend was observed in seed yield when the data was pooled over 2013 and 2014. Topping of mesta at 45 DAS recorded significantly higher values of seed yield as well as yield attributing characters over topping at 30 DAS. However, the pooled data did not register any significant difference on seed yield between the two topping dates (table 2.64). The interaction between sowing date and topping time revealed that significantly higher seed yield of mesta was recorded with 15th May sowing and topping on 45 DAS (9.44 q/ha) while interaction between topping at 45 DAS and 60 cm x 10 cm spacing recorded significantly higher seed yield (7.66 q/ha) of the crop at Aduthurai (table 2.65). Thus sowing of mesta on mid May with 60 cm x 10 cm spacing and topping at 45 DAS is recommended for achieving higher seed yield of the crop in Aduthurai region of Tamil Nadu.

Table 2.64 Effect of date of sowing, spacing and topping on yield attributes and seed yield of mesta at Aduthurai, Tamil Nadu

Treatments	Yield attributes of mesta				Seed yield (q/ha)	
	Branches / plant	Pods/plant	Seeds/pod	1000 seed weight (g)	2014	Pool*
Date of sowing						
D_1: 15th May	14.9	27.9	23.8	24.50	9.14	9.16
D_2 : 30th May	12.9	21.2	24.3	23.89	8.51	8.57
D_3 : 15th June	5.9	9.5	20.2	23.33	5.66	5.69
D_4 : 30th June	2.7	5.7	14.8	24.07	5.62	5.73
SEm±	0.37	0.78	0.65	0.18	0.23	0.12
$CD_{(P=0.05)}$	1.3	2.7	2.2	0.62	0.79	0.41
Spacing						
S_1 : 30 cm x 10 cm	7.3	13.3	19.2	23.63	6.98	7.02
S_2 : 45 cm x 10 cm	9.6	15.8	21.5	23.91	7.33	7.36
S_3 : 60 cm x 10 cm	10.4	19.2	21.7	24.31	7.38	7.49
SEm±	0.29	0.21	0.51	0.11	0.09	0.05
$CD_{(P=0.05)}$	0.9	0.6	1.5	0.33	0.27	0.15
Topping						
T_1 : 30DAS	8.6	15.6	20.3	23.87	6.99	7.06
T_2 : 45 DAS	9.5	16.5	21.3	24.03	7.47	7.52
SEm±	0.09	0.09	0.21	0.05	0.07	0.04
$CD_{(P=0.05)}$	0.3	0.3	0.6	0.14	0.20	NS

* - pool of 2013 & 2014

Table 2.65 Interaction effect of date of sowing, topping and spacing on seed yield of mesta at Aduthurai, Tamil Nadu (pool data of 2013 & 2014)

Time of topping	Seed yield (q/ha)						
	Date of sowing				Spacing		
	15th May	30th May	15th June	30th June	30 cm x 10 cm	45 cm x 10 cm	60 cm x 10 cm
30 DAS	8.88	8.13	5.5	5.73	6.64	7.23	7.3
45 DAS	9.44	9.01	5.88	5.72	7.4	7.48	7.66
SEm±	0.07				0.06		
$CD_{(P=0.05)}$	0.20				0.17		

Kendrapara: The experimental data revealed that the moderate spacing of 45 cm x 10 cm was statistically at par with wider spacing of 60 cm x 10 cm with regard to number of pods/plant and seed yield of mesta but the treatment was significantly superior to closer spacing of 30 cm x 10 cm in this regard (table 2.66). The seed yield of mesta recorded with topping on 45 DAS was significantly higher than the yield with topping on 30 DAS though the change in topping date did not exert any significant influence on yield attributing characters. The pooled data of 2013 and 2014 revealed that the effect of spacing and date of topping on seed yield was non-significant at Kendrapara, Odisha (table 2.66).

Table 2.66 Effect of date of sowing, spacing and topping on yield attributes and seed yield of mesta at Kendrapara, Odisha

Treatments	Yield attributes				Seed yield (q/ha)	
Date of sowing	Pods/plant	Productive branches / plant	Seeds/pod	1000 seed weight (g)	2014	Pool*
Spacing						
S_1 : 30 cm x 10 cm	25.2	4.5	23.0	22.05	5.70	6.19
S_2 : 45 cm x 10 cm	34.2	5.0	23.8	22.38	6.20	6.78
S_3 : 60 cm x 10 cm	33.00	4.7	23.6	22.05	6.08	6.41
SEm±	0.96	0.38	0.47	0.09	0.06	0.09
$CD_{(P=0.05)}$	3.8	NS	NS	NS	0.23	NS
Topping						
T_1 : 30DAS	29.5	4.7	23.2	22.12	5.89	6.31
T_2 : 45 DAS	32.0	4.8	23.7	22.20	6.09	6.60
SEm±	0.78	0.17	0.30	0.08	0.05	0.06
$CD_{(P=0.05)}$	NS	NS	NS	NS	0.17	NS

* - pool of 2013 & 2014

Amadalavalasa: The experimental data revealed that number of pods/plant, and seed yield recorded with 21st July sowing were statistically at par with 1st July sowing but were significantly superior to that with other sowing dates. No significant variation in number of seeds/plant of mesta was observed when crop was sown between 1st July to 6th August though the value decreased significantly thereafter (table 2.67).Wider spacing of 60 cm x 10 cm recorded significantly higher number of pods/plant over other spacing though the effect of spacing was non-significant on other yield attributing characters and seed yield of the crop. The effect of date of topping on seed yield and yield attributing characters was also non-significant. The pooled data of 2013 and 2014 revealed that the among the imposed treatments (date of sowing, spacing and date of topping), seed yield of mesta was signifantly influenced by sowing dates only. Sowing of mesta on first or third week of July recorded significantly higher seed yield of the crop at Amadalavalasa, Andhra Pradesh (table 2.67). The seed yield of mesta at Amadalavalasa, in general, was poor possibly due to heavy downpour and strong wind because of *HudHud* cyclone during the crop growth period.

Table 2.67 Effect of date of sowing, spacing and topping on yield attributes and seed yield of mesta at Amadalavalasa, Andhra Pradesh

Treatments	Branches/plant	Pods/plant	Seeds/pod	1000 seed weight (g)	Seed yield(q/ha)
Date of sowing					
D_1: 1st July	5.3	26.2	20.1	19.93	4.83
D_2 : 21st July	5.6	25.7	19.7	19.74	4.87
D_3 : 6th Aug	3.9	20.2	20.3	19.76	2.79
D_4 : 21st Aug	2.6	12.8	17.9	19.54	1.00
SEm±	0.005	0.57	0.29	0.04	0.05
$CD_{(P=0.05)}$	0.02	1.9	1.0	0.13	0.17
Spacing					
S_1 : 30 cm x 10 cm	3.5	17.0	19.1	19.71	3.23
S_2 : 45 cm x 10 cm	4.6	21.5	19.8	19.79	3.72
S_3 : 60 cm x 10 cm	4.9	25.1	19.6	19.74	3.17
SEm±	0.01	0.38	0.90	0.04	0.18
$CD_{(P=0.05)}$	0.02	1.1	NS	NS	NS
Topping					
T_1 : 30DAS	4.3	21.2	19.5	19.77	3.31
T_2 : 45 DAS	4.4	21.2	19.5	19.71	3.44
SEm±	0.01	0.33	0.54	0.02	0.10
$CD_{(P=0.05)}$	0.02	NS	NS	NS	NS

Sunnhemp

NP(SUN-A)1.0: Performance of new sunnhemp genotypes under different fertilizer management schedule

The trial was conducted at Pratapgarh and Aduthurai centres with an objective to determine the performance of new sunnhemp genotype and to develop suitable fertilizer schedule for them. The results obtained are summarized below:

Pratapgarh: The experimental data revealed that sunnhemp entry SUIN-62 recorded maximum value of fibre yield (10.08 q/ha) which was statistically at par with that of other test variety SIUN-63 (9.82 q/ha) and check variety SUIN 053 (9.47 q/ha) but was significantly higher than that of other check variety SH 4 (8.87 q/ha) (table 2.68). Similar trend was observed in plant height and basal diameter and gree biomass also. The fertilizer treatments recorded significantly higher fibre yield of sunnhemp over control though there was no significant variation in fibre yield amongst the treatments. In case of plant height, basal diameter and green biomass, the value of the parameters increased significantly upto 20:40:40 (NPK, kg/ha) dose only (table 2.68).

Table 2.68 Performance of new sunnhemp genotypes under different fertilizer management schedule Pratapgarh, Uttar Pradesh

Treatment	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety				
V_1: SUIN-62	270.0	1.04	370.2	10.08
V_2: SUIN-63	267.2	1.02	359.8	9.82
V_3: SUIN 053	263.4	0.99	350.9	9.47
V_4: SH4	256.1	0.94	326.6	8.87
SEm±	3.13	0.02	10.82	0.28
$CD_{(P=0.05)}$	8.96	0.06	30.9	0.81
Fertilizer				
Control	246.6	0.91	291.7	8.20
N_1 : 20:40:20	262.2	0.99	348.5	9.51
N_2 : 20:40:40	267.0	1.02	360.6	9.74
N_3 : 20:60:40	270.9	1.03	373.9	10.09
N_4 : 20:60:60	274.1	1.06	384.8	10.25
SEm±	3.50	0.02	12.10	0.32
$CD_{(P=0.05)}$	10.02	0.07	34.6	0.91

Fertilizer - (N: P: K kg/ha)

Aduthurai: Fibre yield of the test varieties SUIN-62 (13.06 q/ha) and SUIN-63 (11.64 q/ha) was significantly higher than that of check variety SH 4 (10.64 q/ha) only. Maximum value of plant height was recorded with SUIN 053 (228 cm) while the variation in basal diameter was non-significant (table 2.69). Maximum net return (Rs. 13589/ha) and B:C ratio (1.68) was recorded with check variety SUIN 053 closely followed by test variety SUIN 062 (₹ 12640/ha, 1.63). Plant height, basal diameter, fibre yield, net return and B:C ratio of sunnhemp increased significantly with increase in fertilizer dose and maximum value of all the parameters were recorded with 20:60:60 (NPK, kg/ha) fertilizer dose (table 2.70).

NP (SUN-A) 5.6: Seed yield maximization in sunnhemp

The experiment was conducted at Rahuri, Aduthurai and Pratapgarh to determine the effect of spacing and fertilizer on seed yield of sunnhemp and the results are summarized below. The trial was damaged at Amadalavalasa due to *HudHud* cyclone and data could not be presented.

Table 2.69 Effect of variety and fertilizer on yield attributes and fibre yield of sunnhemp at Aduthurai, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)
Variety			
V_1: SUIN-62	196.1	1.17	13.06
V_2: SUIN-63	226.2	1.18	11.64
V_3: SUIN 053	228.0	1.16	13.44
V_4: SH4	213.4	1.14	10.64
SEm±	0.67	0.01	0.21
$CD_{(P=0.05)}$	1.93	NS	0.61
Fertilizer			
N_1 : 20:40:20	212.6	1.08	10.65
N_2 : 20:40:40	214.8	1.13	11.67
N_3 : 20:60:40	216.8	1.19	12.80
N_4: 20:60:60	219.3	1.24	13.66
SEm±	0.67	0.01	0.21
$CD_{(P=0.05)}$	1.93	0.03	0.61

Fertilizer - (N: P: K kg/ha)

Table 2.70 Economics of sunnhemp genotypes at different fertilizer levels at Adutharai

Treatments	Cost of cultivation (₹/ha)	Gross Return (₹/ha)	Net Return (₹/ha)	B:C ratio
Variety				
V_1: SUIN-62	20015	32655	12640	1.63
V_2: SUIN-63	20015	29094	9079	1.45
V_3: SUIN 053	20015	33604	13589	1.68
V_4: SH4	20015	26614	6599	1.32
Fertilizer				
N_1 : 20:40:20	18925	26644	7719	1.41
N_2 : 20:40:40	19485	29171	9686	1.50
N_3 : 20:60:40	20550	31998	11448	1.56
N_4 : 20:60:60	21100	34154	13054	1.62

Fertilizer - (N: P: K kg/ha)

Rahuri: The perusal of the data revealed that the spacing of 45 cm x 10 cm recorded significantly higher number of pods/plant (86.1) over 30 cm x 10 cm spacing but spacing did not influence number of branches/ plant and seed yield significantly at Rahuri, Maharashtra (table 2.71). Application of NPK exceeding 20:40:40 (kg/ha) dose significantly increased seed yield of sunnhemp crop over control. Almost similar trends was orserved in pods/plants also except in T_4 treatment which was at par with control in this regard. The effect of fertilizer on number of branches/plant of sunnhemp was non-significant at Rahuri, Maharashtra (table 2.71).

Effect of management practices on seed yield of sunnhemp at Rahuri

Table 2.71 Effect of spacing and fertilizer dose on yield attributes and seed yield of sunnhemp at Rahuri, Maharashtra

Treatments	Plant height (cm)	Basal diameter (cm)	Branches / plant	Pods/plant	Seed yield (q/ha)
Spacing					
S_1 : 30 cm X 10 cm	214.2	1.01	17.4	67.5	21.63
S_2 : 45 cm X 10 cm	195.2	1.06	18.1	86.1	20.57
SEm±	2.17	0.02	0.46	2.01	0.48
$CD_{(P=0.05)}$	6.4	NS	NS	5.9	NS
Fertilizer					
$T_{1:}$ Control	209.1	1.05	16.3	66.2	18.98
T_2 : 20:40:20	205.7	1.04	18.9	77.4	21.03
T_3 : 20:40:40	197.7	1.02	17.5	78.4	20.79
T_4 : 20:60:40	207.8	0.99	17.9	75.3	22.77
T_5 : 20:60:60	203.3	1.08	18.2	86.7	21.95
SEm±	3.43	0.03	0.73	3.18	0.77
$CD_{(P=0.05)}$	NS	NS	NS	9.4	2.3

Fertilizer - (N: P: K kg/ha)

Aduthurai: The experimental data revealed that spacing did not have any significant effect on seed yield of sunnhemp while 60 cm x 15 cm spacing significantly increased number of branches and number of pods/plant of the crop (table 2.72). Application of NPK significantly increased seed yield of sunnhemp (8.25-8.59 q/ha) over control (6.85 q/ha) but variation of phosphorus and potassium doses among the fertilizer treatments did not make any significant difference in seed yield of the crop at Aduthurai, Tamil Nadu (table 2.72).

Table 2.72 Effect of spacing and fertilizer dose on yield attributes and seed yield of sunnhemp at Aduthurai, Tamil Nadu

Treatments	Branches /plant	Pods / plant	Seeds/ pod	1000 seed weight (g)	Seed Yield (q/ha)
Spacing					
S_1 : 45 cm x 10 cm	26.5	47.7	6.9	23.68	8.26
S_2 : 60 cm x 15 cm	29.1	50.6	6.9	24.26	8.03
SEm±	0.64	0.61	0.15	0.21	0.14
$CD_{(P=0.05)}$	1.90	1.8	NS	NS	NS
Fertilizer					
T_1: Control	24.5	39.0	6.4	23.50	6.85
T_2. 20:40:20	26.9	50.0	6.9	23.54	8.25
T_3. 20:40:40	28.2	51.4	6.8	24.10	8.57
T_4. 20:60:40	29.5	52.5	7.4	24.31	8.59
T_5. 20:60:60	29.8	52.9	7.0	24.42	8.47
SEm±	1.02	0.96	0.24	0.33	0.22
$CD_{(P=0.05)}$	3.0	2.8	NS	NS	0.64

Fertilizer - (N: P: K kg/ha)

Pratapgarh: Wider spacing of 45 cm x 10 cm spacing resulted in significantly higher number of primary (6.1) and secondary (12.9) branches, pods/plant (60.8) and seeds/pod (8.14) over 30 cm x 10 cm spacing (table 2.73). Test weight was not significantly influenced by spacing. Significantly higher seed yield (14.96 q/ha) was recorded with closer spacing (30 cm x 10 cm) over wider spacing (45 cm x 10 cm) at Pratapgarh, Uttar Pradesh. Application of NPK significantly increased yield attributing characters of sunnhemp over control and highest fertilizer dose (NPK@ 20:60:60, kg/ha) recorded significantly higher number of branches/plant, pods/plant and seeds/ pod over other fertilizer treatments. However, no significant variation in seed yield of sunnhemp was observed among the NPK treatments (table 2.73).

Sisal

NP (SIA) 5.2: Nutrient management in sisal

The experiment was conducted at Bamra, Odisha with an objective to determine the nutrient management schedule in sisal and the results are summarized below. The experimental data revealed that maximum dry fibre yield of sisal (20.2 q/ha) was recorded with T_7 treatment (NPK @ 90:30:60 Kg/ha + sisal waste @ 20 t/ha) which was statistically at par with fibre yield (17.1 q/ha) received with T_6 treatment (NPK @ 60:30:60 Kg/ha + sisal waste @ 20 t/ha). Similarly, T_6 and T_7 treatments were statistically at par with regard to number of leaves / plant, leaf length and number of harvested leaves of sisal and both the treatments recorded significantly higher values of the said parameters over other treatments under study (table 2.74).

Table 2.73 Effect of spacing and fertilizer dose on yield attributes and seed yield of sunnhemp at Pratapgarh, Uttar Pradesh

Treatments	Primary branches/ plant	Secondary branches/plant	Pod /Plant	Seed /pod	1000 seed weight (g)	Seed Yield (q/ha)
Spacing						
S_1 : 30 cm x 10 cm	5.04	10.70	49.44	7.17	38.76	14.96
S_2 : 45 cm x 10 cm	6.10	12.98	60.84	8.14	39.31	12.34
SEm±	0.15	0.19	1.71	0.15	0.25	0.37
$CD_{(P=0.05)}$	0.45	0.58	5.08	0.46	NS	1.10
Fertilizer						
T_1: Control	4.68	10.62	42.42	6.73	37.87	11.46
T_2. 20:40:20	5.40	11.64	52.05	7.47	38.71	13.64
T_3. 20:40:40	5.57	11.90	56.05	7.77	39.18	13.91
T_4. 20:60:40	5.93	12.35	61.50	8.05	39.58	14.49
T_5. 20:60:60	6.27	12.69	63.68	8.27	39.84	14.75
SEm±	0.24	0.31	2.7	0.24	0.39	0.58
$CD_{(P=0.05)}$	0.71	0.92	8.03	0.72	1.16	1.73

Fertilizer - (N: P: K kg/ha)

Table 2.74 Effect of Integrated nutrient management on leaf length, leaf number and fibre yield of sisal at Bamra, Odisha

Treatments	Number of leaves / plant				Leaf length (cm)				Number of harvested leaves	Fibre yield (q/ ha)
	March	June	Sept	Dec	March	June	Sept	Dec		
T_1: Control	11.5	13.0	18.5	23.0	54.9	55.1	56.2	56.5	271.3	6.3
T_2: 30:30:60(NPK,Kg/ha)	12.5	13.8	19.0	25.0	67.5	67.7	70.6	72.5	281.8	8.3
T_3: 60:30:60(NPK,Kg/ha)	13.3	13.8	20.0	26.3	69.3	69.9	74.1	77.1	335.0	10.1
T_4: 90:30:60(NPK,Kg/ha)	14.0	14.5	24.3	29.3	71.1	71.8	76.0	77.6	351.8	10.6
T_5: 120:30:60(NPK,Kg/ha)	12.3	13.0	20.5	25.5	67.8	68.5	70.2	73.3	311.5	9.2
T_6: T_3 +sisal waste @20 t/ha	14.5	16.0	26.8	31.5	88.9	89.2	93.8	96.1	411.5	17.1
T_7: T_4 +sisal waste @20 t/ha	14.8	17.3	28.3	32.3	88.8	89.4	95.2	97.9	443.5	20.2
SEm±	0.58	0.62	0.81	0.88	1.95	1.88	1.82	2.47	19.44	1.20
$CD_{(P=0.05)}$	1.8	1.9	2.5	2.7	6.0	5.8	5.6	7.6	59.9	3.7

Flax

NP (FLA) 1.1: Effect of date of sowing and spacing on fibre yield of flax

The trial was conducted at Pratapgarh and Wellington to determine the effect of date of sowing and spacing on growth and fibre yield of flax. The results are summarized below for 2013-14 crop season for Pratapgarh and Wellington.

Flax crop at Pratapgarh

Pratapgarh: The experimental data of 2013-14 revealed that sowing of flax on 30th October at Pratapgarh, Uttar Pradesh recorded significantly higher plant height (117.2 cm), basal diameter (0.48 cm), tillers (4.9), green weight (231.4 q/ha) and fibre yield (19.46 q/ha) over other sowing dates. Maximum value of green weight (180.9 q/ha), fibre yield (15.23 q/ha) and other yield attributing characters was recorded with 15 cm row spacing and the values of the attributes were statistically at par with those recorded with 25 cm row spacing (table 2.75).

Table 2.75 Effect of date of sowing and spacing on yield attributes and yield of flax at Pratapgarh, Uttar Pradesh

Treatments	Plant height (cm)	Basal diameter (mm)	Tiller count /plant	Green biomass (q/ha)	Dry biomass (q/ha)	Fibre yield (q/ha)
Date of sowing						
D_1 : 15th October	105.8	4.28	4.4	171.3	48.43	14.44
D_2 : 30th October	117.2	4.82	4.9	231.4	65.42	19.46
D_3 : 15th November	104.3	4.21	4.2	166.9	47.55	14.05
$D_{4:}$ 30th Nov	94.4	3.74	3.7	114.5	32.76	10.11
SEm±	1.9	0.15	0.15	5.56	1.56	0.36
$CD_{(P=0.05)}$	5.7	0.43	0.4	16.3	4.58	1.06
Spacing						
S_1 : 15 cm	108.2	4.62	4.6	180.9	51.59	15.23
S_2 : 25 cm	106.8	4.34	4.4	173.8	49.11	14.71
S_3 : 35 cm	101.3	3.82	3.9	158.6	44.92	13.6
SEm±	1.7	0.13	0.13	4.82	1.35	0.31
$CD_{(P=0.05)}$	4.9	0.37	0.4	14.1	3.97	0.92

Wellington: Sowing of flax on 5th January at Wellington, Tamil Nadu recorded significantly higher basal diameter (0.38 cm) and green biomass (40.42 q/ha) over other sowing dates. Plant height of flax, on the other hand, did not vary significantly with change in sowing time from 25th December to 5th January, though maximum value was recorded with 5th January sowing (48.50 cm). Growing flax with 15 cm row spacing recorded significantly more plant height (48.43 cm) and green biomass (37.5 q/ha) of the crop over wider row spacing (35 cm) (table 2.76). However, the plant height and green biomass accumulated by the crop was very low.

Table 2.76 Effect of date of sowing and spacing on yield attributes and yield of flax at Wellington, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)
Date of sowing*			
D_1 : 25th December	46.5	0.35	37.6
D_2 : 5th January	48.5	0.38	40.4
D_3 : 15th January	45.5	0.30	34.1
D_4: 25th January	39.1	0.30	29.9
SEm±	1.41	0.01	1.07
$CD_{(P=0.05)}$	4.8	0.03	3.7
Row Spacing			
S_1 : 15 cm	48.4	0.34	37.5
S_2 : 25 cm	43.7	0.33	35.4
S_3 : 35 cm	42.6	0.33	33.7
SEm±	0.49	0.01	0.98
$CD_{(P=0.05)}$	1.5	NS	2.9

* - D1 : 25/12/2013; D2 : 05/01/2014; D3 : 15/01/2014; D4 : 25/01/2014

Crop Protection

NP (JMPE) 1.1: Survey and surveillance of insect pests and diseases of jute and mesta (1981, Modified in 2006 and 2011)

Centres Allotted: Barrackpore, Bahraich, Nagaon, Kendrapara, Katihar and Coochbehar

Barrackpore: Survey was conducted at three locations *viz*. Berbaria, Badugachia and the Research Farm of CRIJAF, Barrackpore in 24 North Parganas district to assess the infestation of insect pests and diseases of jute. The yellow mite, semilooper, stem weevil, grey weevil and Bihar hairy caterpillar were the major insect pests in all the survey locations (table 3.1). The yellow mite population (no. of mites/cm^2 on second unfolded leaf) and plant infestation (%) was maximum at 40 DAS with 129.39 mites/cm^2 and 85.8 % plant infestation at Berabaria village which coincided with 40 DAS stage of the crop. Among all the three locations at Berabaria the yellow mite infestation was maximum. In all the three locations maximum infestation of mite was recorded at 40-50 DAS coinciding with 3rd week of May. Maximum extent of mite population and infestation was 82.39/cm^2 and 69.9% respectively at Badugachia while at CRIJAF the mite population and infestation was 32.43/cm^2 and 18.33% respectively. In Badugachia and Berabaria villages the semilooper infestation was maximum (100%) on 5.7.14, similarly in general the semilooper infestation started at 50 DAS continued till 95 DAS during the month of June and July. Apion infestation was also maximum with infestation of 51.66% and 53.33% at both the villages respectively. The stem weevil damage occurred from last week of June after 60 DAS of the crop in most of the locations. The infestation of BHC was less (18.67%) in Berbaria as compared to 80.66% and 30.66% in Badugachia and CRIJAF Research Farm respectively. The grey weevil infestation was observed in all the three locations with maximum infestation of 67.69% in Badugachia at 40 DAS during the third week of May. There was no infestation of mealybug at CRIJAF Research Farm however infestation of mealybug at Berabaria and Badgachia was 6.33% and 5.83% respectively during the later stage of the crop after 75 DAS.

Likewise, survey was conducted to assess the intensity of jute disease incidence (table 3.1). It was observed that the stem rot disease was maximum (7.96%) at CRIJAF Research Farm as compared to Berabaria (6.21%) and Badugachia (6.97%). In all the locations the disease aggravated during the late stage of the crop. In, general the root rot incidence was negligible at all the locations and it was documented to be maximum of 2.88%, 2.46% and 0.48% in Berabaria, Badugachia and CRIJAF Research Farm respectively.

Bahraich: The results of survey conducted at Bahraich indicated that there was no infestation of semilooper, stem weevil and Bihar hairy caterpillar in the areas surveyed. Only yellow mite infestation was noticed and its infestation was maximum i.e. 64.45 mites/cm^2 in Basgarhi, 50.60 mites/cm^2 in Nagroor and 28.2 mites/cm^2 in Pipra (table 3.2). In Basgarhi the peak infestation of mite was observed at 60DAS as compared to 120 DAS at Pipra and Nagroor. Stem rot, root rot and mosaic were the major diseases observed in the areas surveyed. The peak incidence of stem rot in Basgrahi, Nagroor and Pipra was 4.5% (60 DAS), 7.6% (120 DAS) and 2.9% (60 DAS) respectively. Maximum root rot and mosaic incidence was 4.35% and 60.70% respectively at 120 DAS in Nagroor. Incidence of anthracnose was not observed.

Table 3.1: Survey of different insect pests and diseases of jute at CRIJAF Research Farm and villages adjacent to Barrackpore during 2014

DAS/ Dates	Yellow mite (no./sq.cm)	Insect pest infestation (%)						Disease incidence (%)	
		Yellow Mite	Semilooper	Stem weevil	BHC	Grey weevil	Mealybug	Stem Rot (PDI)	Root Rot
Location: Berabaria, DOS: 9.4.14 var. JRO-524									
40 DAS (19.05.14)	129.39	85.8	0.00	0.00	0.00	9.65	0.00	0.00	0.00
50 DAS (29.05.14)	3.10	29.16	14.00	0.00	0.00	4.61	0.00	0.00	0.00
62 DAS (10.06.14)	50.08	30.08	11.33	0.00	0.00	11.86	0.00	0.00	0.00
75 DAS (24.06.14)	0.00	0.00	45.33	26.67	18.67	4.45	0.83	1.52	0.00
95 DAS (5.07.14)	0.00	0.00	100.00	51.66	0.00	0.00	6.33	6.21	2.88
Location: Badugachia, DOS: 9.4.14 var. JRO-524									
40 DAS (19.05.14)	82.39	69.9	0.00	19.00	47.00	67.69	0.00	0.00	0.00
50 DAS (29.05.14)	1.96	20.00	17.00	0.00	31.33	22.76	0.00	0.00	0.00
62 DAS (10.06.14)	87.54	43.33	35.33	0.00	0.00	11.60	0.00	0.00	0.00
75 DAS (24.06.14)	0.00	0.00	98.00	33.33	80.66	0.00	5.83	5.76	1.43
95 DAS (5.07.14)	0.00	0.00	100.00	53.33	0.00	0.00	0.00	6.97	2.46
Location: CRIJAF Main Farm DOS: 26.4.14 var. JRO-524									
60 DAS (24.06.14)	32.43	18.33	11.33	45.00	0.00	6.57	0.00	0.92	0.00
85DAS (19.07.14)	0.00	0.00	11.33	13.33	0.00	5.04	0.00	0.49	0.48
100 DAS (2.08.14)	0.00	0.00	26.00	26.66	30.66	7.45	0.00	2.73	0.00
110 DAS (13.08.14)	0.00	0.00	15.33	20.00	30.00	8.73	0.00	7.96	0.43

Table 3.2: Survey of different insect pests and diseases of jute at various locations in Bahraich during 2014

DAS/Date	Yellow mite (no./sq. cm)	Diseases Incidence (%)		
		Stem rot	Root rot	Mosaic
Location : Basgarhi (Mahsi); DOS- 15.04.14; Var: JRC-212				
30 DAS (15.05.14)	1.00	0.00	0.00	1.00
45 DAS (30.05.14)	5.40	0.00	0.00	2.15
60 DAS (15.06.14)	64.45	4.50	3.50	45.45
75 DAS (30.06.14)	25.35	1.50	0.00	5.80
90 DAS (15.07.14)	3.25	0.00	2.50	6.70
120 DAS (30.07.14)	25.70	2.35	4.25	20.80
Location : Nagroor (Chittaura); DOS: 10.04.14 Var: JRC-517				
30 DAS (15.05.14)	0.00	0.00	0.00	0.00
45 DAS (30.05.14)	7.05	0.00	0.00	4.10
60 DAS (15.06.14)	30.70	2.75	2.75	7.30
75 DAS (30.06.14)	0.00	0.00	2.10	0.00
90 DAS (15.07.14)	1.50	0.00	0.00	3.60
120 DAS (30.07.14)	50.60	7.60	4.35	60.70
Location : Pipra (Mihinpurwa); DOS: 15.04.14 Var: NDC-2008				
30 DAS (15.05.14)	0.00	0.00	0.00	2.90
45 DAS (30.05.14)	2.10	0.00	0.00	6.30
60 DAS (15.06.14)	25.00	2.90	4.20	48.90
75 DAS (30.06.14)	0.00	0.00	0.00	1.40
90 DAS (15.07.14)	5.15	0.00	0.00	9.50
120 DAS (30.07.14)	28.20	2.40	1.45	50.10

Nagaon: Major pests and diseases of jute in different crop growth stages was studied in three locations of Nagaon district at 10 days interval, starting from 25 days after sowing (DAS). Jute crop was sown by the farmers mostly in the first fortnight of April. In each location approximately 2 acre area of the crop was surveyed and 5 samples of 2m x 2m size were considered in each acre of land for recording pest incidence. Jute fields of RARS, Shillongani, Nagaon was considered as the fixed location. Cultivation of *capsularis* jute was not observed except the trials at RARS, Shillongani. JRO 524 and Tarun are the varieties grown by the farmers. Jute is grown in areas where soil is of clay loam nature. Jute – Rice is the main cropping sequence in medium low land situation and Jute – *Toria* are the main cropping sequence in the medium and medium high land situation. The report on insect pest infestation and disease records are given in (table 3.3)**.** Severe infestation of Bihar hairy caterpillar was noticed in the later stage of the crop which was to the extent of 34.60%, 52.62% and 54.52% at RARS, Shillongini, Sologuri and

Dhupaguri respectively in first week of August at 105 DAS. Semilooper infestation started after 50 DAS, maximum 24.80% at Shillongini. Yellow mite was moderately prevalent with maximum 6.86 mites/cm^2 at 45 DAS during the first week of June in Dhupaguri area. Indigo caterpillar infestation was noticed at RARS, Shillongani and Sologuri in the early stage till 35 DAS for a short period with maximum 8.68% plant damage. Infestation of *Helicoverpa armigera* was noticed in Sologuri in two numbers of plants. Stem weevil infestation was low. Maximum damage (5.08%) was recorded at Shillongini. Disease scenario was moderate in the places surveyed. Major diseases were root rot, anthracnose and stem rot. Stem rot and root rot started from about 55 day old crop and incidence was highest before harvest of the crop. Anthracnose incidence was maximum (>20%) at 105 DAS.

Kendrapara: The surveillance study indicated that semilooper, stem weevil and yellow mite were prevalent in different stages of crop growth (table 3.4). The peak period of occurrence and intensity of damage varied from pest to pest. Yellow mite occurrence was found only after 25 DAS. Maximum yellow mite population (10.38/cm^2 leaf) was noticed at 45 DAS at JRS, Kendrapara. Semilooper infestation commenced 25 DAS and the highest infestation recorded at 95 DAS (13.26%) at Bhuria location. The stem weevil infestation commenced from 25 DAS and persisted during the entire cropping season. Stem weevil infestation was maximum (10.66%) at JRS, Kendrapara during the third week of May at 45 DAS.

Katihar: Survey was conducted in four locations *viz*; JRS Research Farm and three villages i.e. Pranpur, Dandkhora and Kadawa to assess the extent of infestation and incidence of insect pests and diseases in jute. Yellow mite, stem weevil, semilooper and BHC were the major insect pests in all the locations (table 3.5). BHC infestation was negligible with maximum of 12.6% plant damage at Dandkhora at 85 DAS during third week of July. The mite infestation persisited throughout crop growth period, peak infestation was recorded in the 2^{nd} and 3^{rd} week of June with 62.56, 48.67 89.33 and 49.67 mites/cm^2 leaf area in different locations at JRS Research Farm, Pranpur, Dandkhora and Kadawa respectively. The infestation of semilooper was recorded at peak infestation of 24.33%, 41.00% and 30.33% at JRS Research Farm, Dandkhora and Kadawa respectively at 85 DAS. The infestation of stem weevil was recorded at 75 DAS in all the locations with peak infestation of 14.33% plant damage at Dandkhora at 75 DAS. The major diseases viz; stem rot, root rot, mosaic and anthracnose were recorded in all the three locations. At Pranpur, maximum disease incidence of stem rot and root rot was recorded (9.82% and 8.42%) respectively during last week of July. Anthracnose incidence was very low however in varied from 2.09 to 3.34%. The incidence of mosaic was 5.79%, 9.06%, 6.75% and 5.79% at JRS Research Farm, Pranpur, Dandkhora and Kadawa respectively during 95 DAS.

Coochbehar: The survey was carried out in three locations *viz.* Research Farm of UBKV and other two villages those are very near to Coochbehar namely Dharmobarakutti and Chandanchura. The yellow mite infestation (no. of mite/cm^2 area of second unfold leaf) were maximum at 55 DAS with 25.62 mite/cm^2 and 24.89 mite/cm^2 at UBKV Research plot and at village Dharmobarakutti respectively (table 3.6). In case of village Chandanchura, the highest infestation of yellow mite at early stage of the crop growth i.e 42 DAS was 25.25 mites/cm^2 on second unfolded leaf. Highest infestation of semilooper was noticed at village Chandanchura with more than 20% infestation at 55 DAS and minimum infestation was observed at village Dharmobarakutti, with 7.69 % at 55 DAS.

Stem rot infestation was noticeable at 50 days of crop age but the rate of disease progress during this year was quite low in comparison to earlier years. At harvesting stage, maximum severity was recorded in Chandanchoura (PDI 6.18%) and minimum in UBKV Research Farm (PDI 5.51%). Root rot incidence was recorded 65 days onwards and the incidence was maximum in village Chandanchoura at the time of harvesting (2.39%) followed by village Dharmobarakutti (2.06%). In UBKV Research Farm the incidence was comparatively low (1.68%).

Table 3.3: Survey of insect pests and diseases of jute at Nagaon during 2014

DAS/Date	Yellow mite (no./ sq.cm)	Insect Pest Infestation (%)				Disease Incidence (%)			
		Indigo caterpillar	Semilooper	BHC	Stem weevil	Root rot	Stem rot (PDI)	Anthracnose	Seedling blight
Location: RARS, Shillongani, DOS: 12.04.14, Var: JRO 524									
25 DAS (13.05.14)	3.30	6.62	0.00	0.00	1.72	0.00	0.00	0.00	0.24
35 DAS (23.05.14)	4.80	5.56	0.00	0.00	1.56	0.00	0.00	0.00	0.60
45 DAS (5.06.14)	8.62	0.00	0.00	4.60	4.76	0.00	0.00	0.00	0.50
55 DAS (16.06.14)	2.60	0.00	0.00	2.80	5.08	0.00	0.00	8.80	0.00
65 DAS (25.06.14)	2.80	0.00	8.60	0.00	3.38	4.80	0.10	10.60	0.00
75 DAS (8.07.14)	0.00	0.00	12.20	0.00	3.57	6.20	0.10	14.80	0.00
85 DAS (18.07.14)	0.00	0.00	21.60	12.80	0.00	6.80	0.15	16.60	0.00
95 DAS (28.07.14)	0.00	0.00	24.80	28.60	1.72	8.80	0.20	20.80	0.00
105 DAS (4.08.14)	0.00	0.00	4.80	34.60	0.00	10.20	0.22	20.60	0.00
Location: Sologuri, Dhing, DOS: 09.04.14, Var: JRO 524									
25 DAS (11.05.14)	0.00	8.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (20.05.14)	4.24	8.68	0.00	0.00	1.55	0.00	0.00	0.00	2.58
45 DAS (3.06.14)	1.84	2.60	0.00	0.00	0.00	0.00	0.00	0.00	2.86
55 DAS (12.06.14)	2.76	0.00	6.64	0.00	1.63	0.00	0.00	2.00	0.00
65 DAS (23.06.14)	0.00	0.00	14.62	0.00	3.44	0.00	0.00	2.20	0.00
75 DAS (5.07.14)	0.00	0.00	16.36	7.24	1.69	8.80	0.00	8.60	0.00
85 DAS (15.07.14)	0.00	0.00	10.42	12.46	4.61	12.64	0.10	14.82	0.00
95 DAS (26.07.14)	0.00	0.00	6.20	38.34	0.00	14.2	0.22	19.62	0.00
105 DAS (6.08.14)	0.00	0.00	0.00	52.62	0.00	18.86	0.30	22.68	0.00
Location: Dhupaguri, DOS: 09.04.14, Var: Tarun									
25 DAS (11.05.14)	0.00	0.00	0.00	0.00	1.54	0.00	0.00	0.00	1.24
35 DAS (20.05.14)	3.26	0.00	0.00	0.00	3.17	0.00	0.00	0.00	2.68
45 DAS (3.06.14)	6.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55 DAS (12.06.14)	4.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65 DAS (23.06.14)	2.32	0.00	6.48	2.76	1.72	6.64	0.10	6.80	0.00
75 DAS (5.07.14)	0.00	0.00	11.62	10.66	0.00	8.24	0.12	11.48	0.00
85 DAS (15.07.14)	0.00	0.00	8.44	18.68	1.63	11.64	0.34	14.62	0.00
95 DAS (26.07.14)	0.00	0.00	3.62	32.44	0.00	11.34	0.86	18.8	0.00
105 DAS (6.08.14)	0.00	0.00	1.68	54.52	0.00	12.82	1.00	20.66	0.00

Table 3.4: Survey of insect pests and diseases of jute at Kendrapara during 2014

DAS/ Dates	Yellow mite (no./sq. cm)	Insect Pest Infestation (%)		Disease Incidence (%)		
		Semilooper	Stem weevil	Stem rot (PDI)	Root rot	Mosaic
Location: Hindulia DOS : 27.4.14, Var: Shreshtha (KJC-7)						
25 DAS (11. 05.14)	8.62	2.66	5.36	0.00	0.00	0.00
35 DAS (21. 05. 14)	9.38	3.42	4.42	0.00	0.00	0.00
45 DAS (12. 06. 14)	6.45	6.35	2.58	1.27	0.00	5.71
60 DAS (29.06.14)	6.16	6.92	1.82	1.91	0.00	9.27
75 DAS (14.07.14)	2.33	7.84	0.00	3.24	1.41	13.33
90 DAS (25.07.14)	0.78	8.46	0.00	9.65	5.91	21.66
Location: Darbal; DOS: 15.05.14, Var: Shreshtha (KJC-7)						
25 DAS (08.06.14)	2.25	4.85	2.36	0.00	0.00	0.00
35 DAS (18.06.14)	1.55	5.75	1.56	0.00	0.00	0.00
45 DAS (28. 06. 14)	0.65	7.35	1.46	0.00	0.00	3.37
60 DAS (15.07.14)	0.00	8.55	0.78	2.31	2.76	9.28
75 DAS (29. 07.14)	0.00	10.34	0.00	3.87	9.11	14.31
90 DAS (14.08.14)	0.00	11.92	0.00	5.94	10.41	21.51
Location: Bhauria; DOS: (22.05.14), Var: Shreshtha (KJC-7)						
25 DAS (11. 06.14)	6.54	5.35	2.85	0.00	0.00	0.00
35 DAS (21.06.14)	5.32	6.86	1.78	0.00	0.00	0.00
45 DAS (08.07.14)	2.63	8.64	1.15	0.00	0.00	0.00
60 DAS (22.07.14)	1.16	9.56	0.65	0.00	0.00	3.21
75 DAS (09.08.14)	0.00	12.35	0.00	1.94	1.71	5.29
90 DAS (25-8-14)	0.00	13.26	0.00	3.51	2.79	15.46
Location: JRS Kendrapara; DOS: (04.04.14), Var: Shreshtha (KJC-7)						
25 DAS (28.04.14)	6.33	1.56	6.34	0.00	0.00	0.00
35 DAS (08.05.14)	8.45	1.84	6.89	0.00	0.00	0.00
45 DAS (18.05.14)	10.38	2.13	10.66	0.00	0.00	0.00
60 DAS (28.05.14)	9.26	6.35	8.20	0.00	0.00	0.00
75 DAS (07.06.14)	9.68	6.90	6.36	0.00	0.00	0.00
90 DAS (17.06.14)	10.34	7.35	5.38	0.00	0.00	0.00

Table 3.5: Survey of insect pests and diseases of jute at Katihar during 2014

DAS/Date	Yellow mite (no. /sq. cm)	Insect Pest Infestation (%)			Disease incidence (%)			
		Stem weevil	Semilooper	BHC	Stem rot	Root rot	Mosaic	Anthracnose
Location-Katihar center, DOS. 21.4.14, Var: JRO 204								
10 DAS (01.05.14)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 DAS (16.05.14)	0.00	2.67	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (26.05.14)	0.00	6.22	1.11	0.00	0.00	0.00	0.00	0.00
45 DAS (06.06.14)	13.11	10.78	12.33	0.00	0.00	0.00	0.83	0.00
55 DAS (16.06.14)	35.78	9.44	9.44	0.33	0.00	0.00	0.00	0.00
65 DAS (26.06.14)	62.56	7.56	10.44	1.56	0.69	1.22	4.39	0.37
75 DAS (06.07.14)	54.56	10.78	16.67	3.33	0.00	0.00	0.00	0.00
85 DAS (16.07.14)	37.56	6.00	24.33	7.00	0.00	0.00	0.00	0.00
95 DAS (26.07.14)	0.00	0.00	0.00	0.00	7.37	6.29	5.79	2.09
Location: Kewat Toli-Pranpur DOS. 21.4.14; Var: JRO 204								
10 DAS (01.05.14)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 DAS (16.05.14)	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (26.05.14)	0.00	4.00	0.67	0.00	0.00	0.00	0.00	0.00
45 DAS (06.06.14)	6.67	8.33	5.33	0.00	0	0.00	4.69	0.00
55 DAS (16.06.14)	36.67	6.00	7.33	0.33	0.00	0.00	0.00	0.00
65 DAS (26.06.14)	48.67	7.33	7.33	2.33	2.06	1.11	7.67	1.57
75 DAS (06.07.14)	33.67	4.33	3.67	3.33	0.00	0.00	0.00	0.00
85 DAS (16.07.14)	21.00	2.67	1.67	4.67	0.00	0.00	0.00	0.00
95 DAS (26.07.14)	0.00	0.00	0.00	0.00	9.82	8.42	9.06	2.15
Location: Baura-Dandkhora; DOS. 21.4.14; Var: JRO 204								
10 DAS (01.05.14)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 DAS (16.05.14)	0.00	4.67	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (26.05.14)	0.00	7.00	1.67	0.00	0.00	0.00	0.00	0.00
45 DAS (06.06.14)	13.33	11.67	18.00	0.00	0.00	0.00	3.22	0.00
55 DAS (16.06.14)	29.00	11.33	11.00	0.00	0.00	0.00	0.00	0.00
65 DAS (26.06.14)	89.33	6.67	7.67	1.67	1.03	0.55	5.23	2.10
75 DAS (06.07.14)	83.00	14.33	19.33	2.33	0.00	0.00	0.00	0.00
85 DAS (16.07.14)	36.67	9.33	41.00	12.67	0.00	0.00	0.00	0.00
95 DAS (26.07.14)	0.00	0.00	0.00	0.00	6.76	7.91	6.75	3.34

DAS/Date	Yellow mite (no. /sq. cm)	Insect Pest Infestation (%)			Disease incidence (%)			
		Stem weevil	Semilooper	BHC	Stem rot	Root rot	Mosaic	Anthracnose
Location: Bajharia-Kadawa; DOS. 21.4.14; Var: JRO 204								
10 DAS (01.05.14)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25 DAS (16.05.14)	0.00	2.67	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (26.05.14)	0.00	7.67	1.00	0.00	0.00	0.00	0.00	0.00
45 DAS (06.06.14)	19.33	12.33	13.67	0.00	0.00	0.00	0.83	0.00
55 DAS (16.06.14)	41.67	11.00	10.00	0.67	0.00	0.00	0.00	0.00
65 DAS (26.06.14)	49.67	8.67	16.33	0.67	0.69	1.22	4.39	1.29
75 DAS (06.07.14)	47.00	13.67	27.00	4.33	0.00	0.00	0.00	0.00
85 DAS (16.07.14)	55.00	6.00	30.33	3.67	0.00	0.00	0.00	0.00
95 DAS (26.07.14)	0.00	0.00	0.00	0.00	7.37	6.29	5.79	2.23

Table 3.6: Survey of insect pests and diseases of jute at Coochbehar during 2014

DAS/Date	Yellow mite (no./sq.cm)	Insect pest infestation (%)	Disease incidence (%)	
		Semilooper	Root rot	Stem rot (PDI)
Location: UBKV, Pundibari; DOS: 13.03.14; Var: JRO 524				
28 DAS (09.04.14)	0.00	0.00	0.00	0.00
42 DAS (23.04.14)	15.86	14.90	0.00	0.00
55 DAS (06.05.14)	25.62	16.93	0.00	0.98
70 DAS (21.05.14)	11.67	0.00	0.10	2.28
83 DAS (03.06.14)	0.00	0.00	0.66	3.93
103 DAS (25.06.14)	0.00	0.00	1.68	5.51
Location: Dharmobarakutti G.P. Dhandinguri; DOS: 13.03.14; Var: JRO 524				
28 DAS (09.04.14)	0.00	0.00	0.00	0.00
42 DAS (23.04.14)	18.86	0.00	0.00	0.00
55 DAS (06.05.14)	24.89	7.69	0.00	1.28
70 DAS (21.05.14)	19.32	0.00	0.20	2.72
83 DAS (03.06.14)	0.00	0.00	0.86	3.81
103 DAS (25.06.14)	0	0.00	2.06	6.10
Location: Chandanchura G.P. Madhupur; DOS: 13.03.14; Var: JRO 524				
28 DAS (09.04.14)	0.00	0.00	0.00	0.00
42 DAS (23.04.14)	25.25	11.98	0.00	0.00
55 DAS (06.05.14)	18.00	20.68	0.00	1.26
70 DAS (21.05.14)	15.36	0.00	0.22	2.89
83 DAS (03.06.14)	0.00	0.00	0.88	4.46
103 DAS (25.06.14)	0.00	0.00	2.69	6.18

NP (JB) 1.0a. Screening of jute germplasm against insect pests and diseases

Centres allotted: Nagaon, Bahraich, Kendrapara, Katihar and Coochbehar

Nagaon: Seventy seven *capsularis* germplasm were evaluated against insect pests (table 3.7). The semilooper infestation ranged from 2.22-15.18 % leaf infestation. The germplasm CEX-10 with 2.22% of infestation was least susceptible while CIN-523 (15.18%) was recorded to be most susceptible. None of the entries was free from semilooper infestation. The JRC-698 (C) was recorded most susceptible with 80.40% damage. Maximum infestation of yellow mite was seen on CIN-02, CIN-13,CIN-20 and CIN-26 with 17.78,18.33, 16.67, 18.89 and 16.67 mites/ cm^2 of leaf, whereas the least susceptibility of germplasm was observed in CIN-48, CIN-50, CIN-58, CIN-59, CIN-64, CIN-123, CIN-130 and CIN-139 with mite population of 3.70, 2.78, 3.70, 2.22, 4.17, 2.49, 3.47 and 3.33 mites/cm^2 leaf area. None of the lines showed resistance with absolutely free from infestation. Maximum infestation of June beetle was seen on CIN-13, CIN-116, CEX-14 and CEX-69 with the infestation of 10.67, 10.94, 10.00 and 10.33% of leaf damage. The germplasm lines, CIN-26, CIN-64, CIN-80, CIN-85, CIN-364, CIN-367 and CIN-505 were noted to be most susceptible to stem weevil with >20.00% plant damage. The line, CIN-99 was immune to stem weevil infestation with no damage. Other promising lines with <5% weevil infestation were CIN-48, CIN-65, CIN-138, CIN-142, CEX-10 and CEX-14. As in case of weevil the line CIN-99 was free from BHC infestation whereas in rest of the germplasm lines the plant damage caused by BHC varied from 1.85% in CIN-43 to 29.40% in CIN-210.

Table 3.7: Evaluation of *white* jute germplasm against insect pests at Nagaon during 2014

Germplasm	Semilooper (%)	Yellow mite (no./ cm^2 leaf)	June beetle (%)	Stem weevil (%)	BHC (%)
CIN -02	3.25	17.78	8.27	17.78	4.76
CIN -06	7.78	15.56	9.33	6.80	9.59
CIN -09	6.11	14.44	7.00	7.27	5.09
CIN -10	8.89	8.89	7.33	11.11	4.84
CIN -11	8.33	14.45	6.00	11.32	8.16
CIN -13	6.11	18.33	10.67	9.12	11.11
CIN -15	5.00	13.33	8.00	9.54	3.74
CIN -17	7.22	16.67	8.67	14.04	11.70
CIN -20	7.22	18.89	7.00	8.79	6.46
CIN -26	12.78	16.67	9.33	21.03	12.79
CIN -40	7.22	7.78	8.67	14.78	16.37
CIN - 43	4.72	14.91	7.04	12.96	1.85
CIN - 45	6.67	15.56	7.67	11.97	19.79
CIN - 47	7.78	13.33	6.85	16.25	11.44
CIN - 48	6.11	3.70	4.67	4.24	17.79
CIN - 50	4.44	2.78	7.00	7.87	7.41
CIN - 53	7.22	4.17	6.67	9.03	7.84

Germplasm	Semilooper (%)	Yellow mite (no./ cm² leaf)	June beetle (%)	Stem weevil (%)	BHC (%)
CIN - 58	8.70	3.70	6.33	16.67	3.70
CIN - 59	5.00	2.22	8.67	9.72	2.08
CIN - 64	6.67	4.17	4.67	20.91	3.51
CIN - 65	5.00	7.22	4.67	3.03	5.00
CIN - 67	7.78	15.00	6.33	5.56	12.57
CIN - 68	10.83	8.33	8.67	8.33	5.56
CIN - 80	8.75	11.11	7.92	21.66	13.33
CIN - 81	5.55	10.56	5.00	8.41	19.30
CIN - 84	7.22	10.00	6.67	11.19	15.16
CIN - 85	6.11	13.33	6.33	26.67	18.02
CIN - 86	5.56	8.33	6.78	17.10	11.95
CIN - 91	5.56	12.22	7.43	9.83	11.38
CIN - 93	5.56	10.00	9.33	11.44	6.70
CIN - 94	4.63	13.42	7.22	13.89	8.33
CIN - 99	10.56	8.89	2.83	0.00	0.00
CIN - 101	5.56	14.45	7.00	7.49	6.67
CIN - 103	4.36	10.63	3.57	7.93	9.52
CIN - 105	3.89	9.03	4.68	13.65	14.81
CIN - 107	7.90	4.58	5.26	5.13	5.13
CIN - 108	12.57	8.49	5.90	6.67	11.67
CIN - 116	8.52	11.67	10.94	7.14	7.14
CIN - 117	8.41	5.48	5.71	15.56	3.70
CIN - 120	11.29	4.63	2.22	10.25	18.46
CIN - 123	8.57	2.49	4.17	14.65	7.33
CIN - 125	4.63	10.00	3.89	5.88	9.80
CIN -126	12.96	8.89	5.00	7.14	5.56
CIN -130	7.36	3.47	3.11	8.71	5.56
CIN -138	7.31	8.19	9.44	2.78	9.72
CIN -139	4.45	3.33	9.00	10.18	5.56
CIN -142	11.94	6.25	5.92	3.03	9.09
CIN -147	10.19	16.11	4.00	11.18	6.25
CIN -166	4.44	6.67	4.00	10.17	18.51

Germplasm	Semilooper (%)	Yellow mite (no./ cm^2 leaf)	June beetle (%)	Stem weevil (%)	BHC (%)
CIN -179	7.70	9.03	4.40	13.06	6.67
CIN -210	6.99	9.19	5.00	11.81	29.40
CIN -259	4.45	11.39	3.00	11.54	15.14
CIN -299	6.67	8.89	6.00	19.21	10.94
CIN -364	8.89	8.25	5.24	21.43	11.90
CIN -367	9.45	9.44	6.67	21.24	16.19
CIN -447	11.67	4.44	6.67	15.06	10.68
CIN -462	7.78	4.44	7.00	13.69	7.85
CIN -498	8.34	11.67	5.67	12.40	9.26
CIN -505	7.78	11.67	7.67	23.38	14.31
CIN -523	15.18	7.59	2.00	10.15	19.50
CIN -532	12.78	7.22	7.00	14.03	12.31
CIN -551	9.44	8.33	4.67	11.11	3.70
CEX-03	8.33	15.00	8.33	12.28	5.75
CEX-05	7.92	4.72	7.08	6.06	10.51
CEX-10	2.22	9.45	3.00	4.54	6.06
CEX-14	13.89	11.67	10.00	4.76	9.52
CEX-15	7.38	9.44	2.38	9.47	4.35
CEX-22	6.67	10.00	4.67	14.22	18.88
CEX-25	5.56	6.11	2.22	14.82	10.18
CEX-28	9.59	7.64	8.08	10.23	3.03
CEX-33	13.89	3.33	8.67	8.61	10.23
CEX-38	9.45	4.44	6.33	14.25	19.80
CEX-46	7.22	7.22	4.67	8.66	14.01
CEX-51	12.78	12.22	7.33	13.45	3.03
CEX-69	9.44	6.67	10.33	24.68	13.25
JRC 517 (C)	11.67	11.67	6.33	10.28	15.22
JRC 698 (C)	80.40	7.22	9.52	6.11	27.86

Bahraich: Among the insect pests only yellow mite and stem weevil were found to infest the crop. The yellow mite infestation among the germplasm lines varied from 0.50-3.22%. The lines, CIN-11, CIN-45, CIN-64, CIN-116, CIN-462, CEX-10, CEX-15 and CEX-38 were found to be more resistant with <1.00% of plant damage. The infestation of stem weevil was also low (table 3.8). None of the lines showed infestation >3.00%. The lines CIN-13, CIN-48, CIN-101,

CIN-139, CIN-498 and CEX-15 were found to be more resistant with least infestation of 0.65, 0.98, 0.35, 0.94, 0.75 and 0.89% respectively. None of the lines showed resistance against root rot and stem rot incidence. Root rot incidence was maximum on CIN-45 (8.72%), CIN-26 (7.20%), CIN-43(7.72%) and CEX-10(7.70%). The lines showing resistance against root rot were CIN-15 and CIN-505 with 0.95% and 0.90% incidence of stem rot respectively. Similarly none of the lines showed immune to stem rot incidence. The lines which were found to be more susceptible were CIN-10(4.65%), CIN-85(4.26%), CIN-86 (4.34%), CIN-93 (4.56%), CIN-107 (4.65%) and CIN-117 (4.35%), whereas the least incidence of stem rot was found on the lines were CIN-11, CIN-15, CIN-26, CIN-59, CIN-84, with 1.02% incidence. The check line JRC 698 was least susceptible to stem weevil (0.94%).

Table 3.8: Relative infestation of insect pests and diseases in *capsularis* germplasm at Bahraich during 2014

Germplasm	Yellow mite (no./cm² leaf area)	Infestation/ incidence (%)			Germplasm	Yellow mite (no./cm² leaf area)	Infestation/ incidence (%)		
		Stem weevil	Root rot	Stem rot			Stem weevil	Root rot	Stem rot
CIN-02	1.25	1.00	2.25	3.25	CIN-120	1.20	2.10	1.15	1.25
CIN-06	2.00	1.25	3.25	2.05	CIN-123	2.85	1.35	1.46	1.26
CIN-09	1.25	1.38	4.25	1.85	CIN-125	3.10	1.48	1.20	1.24
CIN-10	1.02	1.25	2.50	4.65	CIN-126	1.45	1.98	2.02	1.04
CIN-11	0.75	1.15	4.55	1.02	CIN-130	1.15	1.48	1.02	1.18
CIN-13	1.20	0.65	4.25	2.95	CIN-138	1.95	1.25	2.15	1.26
CIN-15	2.15	2.00	0.95	1.02	CIN-139	2.16	0.94	4.26	2.21
CIN-17	1.32	1.95	2.75	2.15	CIN-142	3.22	1.20	5.24	4.25
CIN-20	2.35	2.12	1.58	1.95	CIN-47	2.10	1.15	2.24	2.36
CIN-26	1.75	1.55	7.20	1.02	CIN-166	2.95	1.25	2.96	2.14
CIN-40	2.16	1.25	2.04	3.65	CIN-179	1.20	1.02	2.83	2.00
CIN-43	3.26	1.15	7.72	1.28	CIN-210	1.25	1.13	4.72	3.72
CIN-45	0.65	1.28	8.72	3.45	CIN-259	1.10	1.98	3.65	1.85
CIN-47	1.35	1.15	1.98	2.14	CIN-299	1.20	1.10	2.10	3.1
CIN-48	0.75	0.98	3.35	1.20	CIN-364	1..90	1.15	2.75	2.25
CIN-50	1.20	2.10	6.65	3.42	CIN-367	1.28	1.48	3.55	2.05
CIN-53	2.65	2.12	3.72	2.48	CIN-447	1.00	1.16	2.65	3.45
CIN-58	1.44	1.28	2.36	1.26	CIN-462	0.65	1.25	3.75	1.12
CIN-59	1.10	1.15	4.30	1.02	CIN-498	1.15	0.75	3.95	2.75
CIN-64	0.55	1.45	1.46	2.06	CIN-505	2.00	2.00	0.90	1.10
CIN-65	2.24	1.32	1.25	1.15	CIN-523	1.31	1.65	2.85	2.05
CIN-67	2.36	1.25	4.00	1.32	CIN-532	2.20	1.82	1.64	1.85

Germplasm	Yellow mite (no./cm² leaf area)	Infestation/ incidence (%)			Germplasm	Yellow mite (no./cm² leaf area)	Infestation/ incidence (%)		
		Stem weevil	Root rot	Stem rot			Stem weevil	Root rot	Stem rot
CIN-68	2.18	2.24	2.14	2.95	CIN-551	1.65	1.50	5.80	1.12
CIN-80	1.98	2.10	4.26	3.34	CEX-03	1.95	1.15	2.00	3.75
CIN-81	1.88	2.18	3.34	1.24	CEX-05	2.14	1.20	6.80	2.10
CIN-84	2.16	1.98	3.25	1.02	CEX-10	0.75	1.22	7.70	3.25
CIN-85	1.26	2.10	3.66	4.26	CEX-14	1.25	1.10	2.05	2.24
CIN-86	1.02	1.28	3.83	4.34	CEX-15	0.72	0.89	3.25	1.25
CIN-91	2.10	1.22	4.24	3.37	CEX-22	1.10	2.05	6.75	3.44
CIN-93	2.12	1.98	5.10	4.56	CEX-25	1.55	2.10	3.82	2.28
CIN-94	2.24	2.18	6.75	2.15	CEX-28	1.41	1.30	2.25	1.28
CIN-99	2.25	1.23	3.80	2.4	CEX-33	1.10	1.20	2.25	1.2
CIN-101	2.14	0.35	2.65	1.25	CEX-38	0.50	1.55	1.56	1.88
CIN-103	2.12	1.35	2.95	2.22	CEX-46	2.20	1.40	1.35	1.25
CIN-105	2.16	1.25	4.42	3.92	CEX-51	2.13	1.28	3.92	1.44
CIN-107	1.10	1.25	7.18	4.65	CEX-69	2.19	2.12	2.18	3.15
CIN-108	1.15	1.20	3.54	3.25	JRC 517+	2.00	1.95	3.77	3.46
CIN-116	0.75	1.98	3.32	2.24	JRC 698+	1.68	2.05	3.30	0.94
CIN-117	2.26	2.16	3.35	4.35	--	--	--	--	--

Katihar: Out of 77 lines of *tossa* jute (*C. olitorius*) evaluated against root rot and stem rot diseases, the incidence of root rot was maximum on OIN-06 (7.24%), OIN-1123 (7.90%) and OIN-508 (7.08%) (table 3.9). The check variety, JRO 524 recorded maximum stem rot incidence (10.54%). The lines showing resistance reaction with least incidence of <2% were OIN-32, OIN-63, OIN-76, OIN-84, OIN-111, OIN-112, OIN-113, OIN-130, OIN-136 and OIN-142. Similarly, none of the lines were found to be immune against stem rot incidence. The most susceptible lines with highest incidence of stem rot were OIN-147, OIN-156, OIN-559, OIN-1123 and OEX-29 with 5.65, 5.62, 6.64, 5.85 and 6.24% respectively as compared to check varieties, JRO 524 (6.25%) and JRO 204 (7.44%).

Similarly in *C. capsularis* germplasm the incidence of diseases viz., root rot, stem rot and mosaic were found moderate to high. There were a total of 13 lines which were found to be completely immune to root rot disease incidence. The highest root rot incidence of 5.68% was recorded on CIN-45 followed by 5.11% in CEX-05 as compared 5.84% in the check variety, JRC 517 (table 3.10). Similarly the incidence of stem rot disease was moderate across the germplasm and none of the lines showed the incidence >5.00% including check variety. Total of 9 lines showed immune reaction to stem rot disease. The incidence of mosaic was more, where none of the lines showed <15.00% of disease. The variety CIN-11 was most susceptible with highest of 55.60% incidence.

Table 3.9: Evaluation of *tossa* jute germplasm against diseases at Katihar during 2014

Germplasm	Incidence (%)		Germplasm	Incidence (%)	
	Root rot	Stem rot (PDI)		Root rot	Stem rot (PDI)
OIN-01	3.86	1.56	OIN-113	1.36	2.24
OIN-03	2.45	1.11	OIN-116	3.48	1.78
OIN-06	7.24	3.46	OIN-128	6.28	4.86
OIN-09	5.66	3.18	OIN-130	1.48	2.10
OIN-15	3.74	2.87	OIN-133	2.68	4.82
OIN-17	5.23	3.48	OIN-134	3.44	1.45
OIN-18	4.54	2.34	OIN-136	1.12	2.86
OIN-22	3.58	1.12	OIN-138	7.34	4.12
OIN-25	4.64	3.82	OIN-141	3.79	1.96
OIN-30	3.45	3.21	OIN-142	1.22	1.90
OIN-32	1.89	1.22	OIN-145	6.38	2.48
OIN-38	6.36	3.86	OIN-147	2.26	5.65
OIN-40	3.36	1.74	OIN-148	4.26	3.24
OIN-41	2.84	2.95	OIN-156	2.56	5.62
OIN-48	6.45	4.64	OIN-421	5.50	2.35
OIN-49	3.78	1.86	OIN-471	4.76	3.12
OIN-52	4.75	3.48	OIN-490	5.21	2.48
OIN-59	3.42	2.28	OIN-508	7.08	5.44
OIN-60	5.64	1.74	OIN-559	2.88	6.64
OIN-62	4.38	2.83	OIN-617	4.77	2.12
OIN-63	1.48	3.79	OIN-647	2.69	1.70
OIN-65	5.94	2.64	OIN-656	4.88	1.94
OIN-68	3.84	1.65	OIN-1041	3.65	2.62
OIN-69	5.96	3.92	OIN-1123	7.90	5.85
OIN-71	5.12	3.22	OIJ-63	2.22	2.12
OIN-72	6.34	4.12	OIJ-88	3.96	1.98
OIN-73	4.85	1.35	OIJ-211	3.67	2.42
OIN-74	3.26	1.73	OIJ-226	5.45	2.62
OIN-76	1.34	3.21	OIJ-241	6.84	3.08
OIN-77	6.45	2.44	OIJ-276	5.69	2.45

Germplasm	Incidence (%)		Germplasm	Incidence (%)	
	Root rot	Stem rot (PDI)		Root rot	Stem rot (PDI)
OIN-83	5.55	3.22	OIJ-278	4.36	3.22
OIN-84	1.86	2.38	OIJ-296	5.27	2.85
OIN-86	4.89	1.88	OEX-05	3.78	1.74
OIN-93	5.85	2.67	OEX-09	4.74	2.64
OIN-94	4.29	1.84	OEX-13	2.68	1.11
OIN-104	2.48	3.28	OEX-29	5.33	6.24
OIN-108	4.52	2.96	JRO 524+	10.54	6.25
OIN-111	1.74	3.12	JRO 204+	8.72	7.44
OIN-112	1.86	1.74	KTC-1	4.55	3.68

Table 3.10: Screening of *white jute* germplasm against diseases at Katihar during 2014

Germplasm	Incidence (%)			Germplasm	Incidence (%)		
	Root rot	Stem rot (PDI)	Mosaic		Root rot	Stem rot (PDI)	Mosaic
CIN- 02	1.45	1.68	22.00	CIN -116	1.82	2.76	35.86
CIN-06	0.00	0.00	28.50	CIN -117	2.56	2.22	34.86
CIN- 09	0.00	0.00	18.85	CIN -120	0.00	1.26	18.48
CIN -10	1.65	1.22	35.24	CIN -123	1.28	0.00	25.80
CIN -11	2.26	1.32	55.60	CIN -130	0.00	1.82	20.58
CIN -13	0.00	2.45	42.45	CIN- 138	2.05	1.21	24.48
CIN -15	0.00	0.90	25.84	CIN -139	0.00	1.60	27.50
CIN -17	1.88	1.24	30.68	CIN -142	1.43	2.64	32.54
CIN -20	0.00	1.78	26.50	CIN -147	1.90	1.18	30.40
CIN- 26	3.67	2.86	15.84	CIN- 166	2.22	2.12	25.80
CIN -40	1.14	0.00	23.50	CIN- 179	2.58	1.30	34.65
CIN -43	4.68	3.67	36.40	CIN -210	4.48	2.82	28.45
CIN -45	5.68	3.98	34.20	CIN -259	3.29	2.58	26.90
CIN -47	0.00	0.00	30.00	CIN- 299	2.68	1.12	31.25
CIN -48	2.35	2.68	21.58	CIN- 364	0.00	2.45	18.36
CIN -50	4.47	3.85	28.45	CIN -367	2.25	1.72	16.46
CIN- 53	1.63	2.12	14.68	CIN -447	3.38	3.78	24.34

Germplasm	Incidence (%)			Germplasm	Incidence (%)		
	Root rot	Stem rot (PDI)	Mosaic		Root rot	Stem rot (PDI)	Mosaic
CIN -58	1.06	0.00	18.24	CIN- 462	3.72	1.75	38.24
CIN -59	2.88	1.56	32.28	CIN- 498	4.10	4.88	21.50
CIN -64	0.00	0.00	26.48	CIN- 505	2.21	3.12	20.84
CIN -65	0.00	0.86	16.86	CIN -523	2.84	1.49	30.40
CIN -67	3.84	2.45	42.00	CIN -532	3.12	2.76	22.50
CIN- 68	2.66	1.28	38.40	CIN- 551	4.33	2.62	25.48
CIN -80	1.21	1.63	29.58	CEX -03	4.86	4.12	32.60
CIN- 81	4.85	2.40	22.58	CEX- 05	5.11	3.38	25.62
CIN -84	3.78	1.11	20.50	CEX- 10	2.84	2.70	35.50
CIN -85	2.25	0.00	28.42	CEX- 14	4.34	4.28	23.65
CIN- 86	1.86	1.48	31.42	CEX- 22	4.22	2.47	28.40
CIN -91	3.28	1.28	24.34	CEX- 25	3.82	3.12	30.00
CIN- 93	2.08	2.48	21.48	CEX -28	2.54	1.68	24.80
CIN -94	4.79	1.64	27.46	CEX -33	4.16	2.48	17.50
CIN -99	3.85	1.96	30.00	CEX -38	2.75	3.89	25.68
CIN- 101	0.00	0.00	19.35	CEX -46	1.38	3.86	15.40
CIN -103	1.94	3.48	20.68	CEX -51	4.52	3.21	24.50
CIN -105	3.70	1.42	25.66	CEX -69	4.32	2.84	28.30
CIN- 107	2.96	2.12	21.48	JRC 517+	5.84	3.40	32.58
CIN- 108	2.48	1.15	30.44	JRC 698+	4.38	3.86	28.40

Kendrapara: Out of the 77 *olitorius* germplasm entries, stem weevil, yellow mite and semilooper infestation was found in all the entries. The stem weevil infestation varied from 1.14% (OIN-471 and OIN-112) to 6.85 % (OIN-40, OIN-72 and OIN-147) (table 3.11). The yellow mite population varied from 2.35 mite/leaf (OIN-22,OIN-72,OIN-74 and OIN-111) to 8.78 mite/ leaf (OIN-59,OIN-68 and OIN-156) and the semilooper varied from 2.36% (OIN-15, OIN-84, OIN-112 and OIN-1041) to11.2% (OIN-48 and OIN-141) infestation.

Out of the 77 *Capsularis* germplasm entries, stem weevil, yellow mite and semilooper infestation were found in all the entries (table 3.12). The stem weevil infestation varied from 0.9% (CIN-47 and CIN-93) to 5.98% (CIN-94,CIN-103 and CIN-126),yellow mite population varied from 1.86 mite/leaf (CIN-06,CIN-58,CIN-81aand CEX-15) to 8.87 mite/leaf (CIN-40,CIN-108 and CIN-505) and the semilooper infestation varied from 2.12% (CIN-20,CIN-116 and CEX-15) to 10.52% (CIN-65 and CIN-85).

Table 3.11: Relative infestation of insect pests in tossa jute at Kendrapara during 2014

Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)	Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)
OIN-01	2.56	2.58	6.59	OIN-112	1.14	3.65	2.36
OIN-03	2.89	3.56	6.54	OIN-113	5.48	7.58	6.56
OIN-06	3.15	2.89	5.58	OIN-116	4.59	8.62	6.48
OIN-09	1.58	2.65	4.26	OIN-128	3.58	6.35	6.89
OIN-15	4.67	4.89	2.36	OIN-130	2.35	2.65	5.24
OIN-17	1.50	5.78	2.89	OIN-133	2.36	3.56	4.36
OIN-18	1.78	6.24	9.48	OIN-134	1.29	4.78	2.37
OIN-22	1.87	2.35	10.25	OIN-136	5.46	8.48	2.89
OIN-25	3.00	2.89	7.65	OIN-138	3.54	3.58	3.59
OIN-30	2.14	2.65	2.38	OIN-141	2.63	6.54	11.2
OIN-32	2.89	2.48	4.36	OIN-142	5.37	2.38	10.32
OIN-38	4.68	3.25	3.78	OIN-145	6.12	3.49	9.56
OIN-40	6.85	3.58	2.98	OIN-147	6.85	3.57	2.38
OIN-41	5.26	3.98	3.48	OIN-148	2.54	6.57	4.65
OIN-48	6.45	4.59	11.2	OIN-156	3.53	8.78	8.56
OIN-49	2.59	5.98	7.00	OIN-421	2.75	2.78	5.65
OIN-52	6.25	5.64	7.56	OIN-471	1.14	3.49	7.65
OIN-59	2.65	8.78	4.56	OIN-490	3.56	3.13	8.25
OIN-60	2.58	4.65	4.58	OIN-508	6.58	6.45	2.39
OIN-62	3.26	3.65	5.64	OIN-559	5.47	5.15	9.65
OIN-63	2.65	4.98	6.58	OIN-617	4.26	5.45	8.59
OIN-65	5.34	7.65	6.89	OIN-647	2.38	3.45	6.54
OIN-68	3.26	8.78	5.68	OIN-656	3.26	3.45	3.65
OIN-69	2.38	2.59	5.65	OIN-1041	4.65	8.1	2.36
OIN-71	4.68	2.65	11.15	OIN-1123	5.17	7.89	2.68
OIN-72	6.85	2.35	6.58	OIJ-63	1.86	2.36	2.78
OIN-73	5.68	6.59	4.69	OIJ-88	2.67	4.59	7.56
OIN-74	3.56	2.35	5.64	OIJ-211	2.68	3.82	4.58
OIN-76	4.70	6.87	4.78	OIJ-226	2.35	3.45	8.58
OIN-77	4.58	3.45	7.68	OIJ-241	6.14	6.54	9.56

Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)	Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)
OIN-83	2.56	7.56	3.25	OIJ-276	6.58	6.12	3.65
OIN-84	6.45	2.38	2.36	OIJ-278	2.35	6.1	6.59
OIN-86	2.14	6.78	2.48	OIJ-296	1.56	3.48	3.45
OIN-93	1.35	8.78	2.99	OEX-05	5.36	7.56	2.39
OIN-94	2.48	8.12	10.58	OEX-29	2.36	3.45	4.58
OIN-104	3.24	7.48	4.69	JRO 524+	6.50	6.89	9.56
OIN-108	2.65	4.59	8.49	JRO 204+	6.45	7.15	10.57
OIN-111	1.24	2.35	7.63	--	--	--	--

Table 3.12: Relative infestation of insect pests in white jute at Kendrapara during 2014

Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)	Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)
CIN-02	1.45	2.58	8.78	CIN-116	2.48	2.65	2.12
CIN-06	2.45	1.86	9.56	CIN-117	2.49	2.90	2.78
CIN-09	3.21	6.48	4.59	CIN-120	1.48	3.58	3.12
CIN-10	1.48	5.98	2.56	CIN-125	3.42	3.69	4.48
CIN-11	4.58	4.57	2.87	CIN-126	5.98	3.51	6.28
CIN-13	1.58	4.93	6.48	CIN-130	2.58	2.59	3.68
CIN-15	0.98	4.21	7.56	CIN-138	2.48	7.65	4.39
CIN-17	0.90	5.64	6.45	CIN-139	3.58	6.59	7.59
CIN-20	2.35	2.65	2.12	CIN-147	1.78	6.59	4.58
CIN-26	5.24	8.20	9.58	CIN-166	3.58	5.87	4.78
CIN-40	4.65	8.78	3.25	CIN-179	4.58	5.46	6.95
CIN-43	5.78	7.89	7.59	CIN-210	4.79	2.52	3.58
CIN-45	1.78	6.45	5.65	CIN-259	3.58	1.98	4.65
CIN-47	0.90	6.48	7.58	CIN-299	3.54	5.98	3.65
CIN-48	4.25	2.38	5.65	CIN-364	3.16	5.79	9.87
CIN-50	3.68	5.64	5.64	CIN-367	2.48	2.56	6.45
CIN-53	2.89	2.48	3.54	CIN-447	1.14	3.94	10.52
CIN-58	1.45	1.86	2.89	CIN-462	1.48	4.78	5.61
CIN-59	1.89	1.90	3.48	CIN-498	5.64	4.52	3.46

Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)	Germplasm	Stem Weevil (%)	Yellow Mite (no./cm² leaf)	Semilooper (%)
CIN-65	4.59	2.98	10.52	CIN-505	5.58	8.78	7.58
CIN-67	3.87	2.45	9.58	CIN-523	3.48	3.58	3.87
CIN-68	2.56	3.45	4.58	CIN-551	1.45	2.59	2.98
CIN-80	6.45	5.68	6.58	CEX-05	4.78	4.78	3.58
CIN-81	6.12	1.86	3.45	CEX-10	3.59	5.46	7.65
CIN-84	2.38	7.65	5.23	CEX-14	5.64	2.58	4.59
CIN-85	4.59	7.45	10.52	CEX-15	2.73	1.86	2.12
CIN-86	1.25	3.48	5.45	CEX-22	2.49	4.58	3.58
CIN-91	1.48	3.47	6.58	CEX-25	1.48	5.61	5.48
CIN-93	0.90	2.48	3.48	CEX-28	4.61	3.47	4.89
CIN-94	5.98	2.59	6.45	CEX-33	3.45	3.47	6.58
CIN-99	5.00	2.75	4.52	CEX-38	1.18	2.59	6.58
CIN-101	4.72	3.43	3.26	CEX-46	3.59	7.65	10.52
CIN-103	5.98	8.21	7.59	CEX-69	4.58	2.38	4.89
CIN-105	3.48	8.64	6.48	JRC 517+	5.48	6.87	8.56
CIN-107	5.41	7.36	4.59	JRC 698+	5.14	7.98	9.87
CIN-108	3.57	8.78	4.57	--	--	--	--

*6 germplasm lines did not germinate

Coochbehar: Among the *olitorius* germplasm accessions, maximum yellow mite incidence (no./sq. cm of 2nd unfold leaf) was noticed in OIN-01 (28.45), OIN-03 (28.08) OIN-22 (31.84), OIN-49 (24.80) , OIN-74 (30.09) and OIJ-88 (25.61) (table 3.13). The semilooper infestation among the *tossa* jute germplasms varied from 10.12% in OIJ-296 to 29.99% in OIN-128. None of the *capsularis* germplasm showed yellow mite infestation of <10.00 mites/cm² of leaf.

Comparatively less yellow mite population was recorded in CIN-06 (10.42), CIN-09 (10.34), CIN-84 (10.67), and CIN-166 (10.68). Semilooper damage was low in CIN-26 (9.74), CIN-43 (8.01), CIN-48 (8.46), CIN-120 (9.154%) and CIN-123 (9.43%) (table 3.14). Significantly more stem rot severity was recorded in CIN-17, CIN-43, CIN-94, CIN-99, CIN-107, CIN-108, CIN-123, CIN-125, CIN-126, CIN-130, CIN-210, CEX-14, CEX-46, CEX-51 and CEX-69 with stem rot codex of 44.02, 45.03, 48.81, 55.76, 64.73, 44.50, 67.52, 66.82, 56.74, 45.45, 44.14, 107.95, 54.26, 84.61 and 59.80 respectively. The root rot infection was very low and the lines CIN-06, CIN-10, CIN-53, CIN-68, CIN-85, CIN-117, CIN-130, CIN-139, CIN-147, CIN-166 and CIN-259 were free from disease incidence.

Table 3.13: Screening of *olitorius* germplasm against insect pests and diseases at Coochbehar during 2014

Germplasm	Yellow mite (no./cm² leaf)	Semilooper (%)	Stem rot (CODEX)	Root rot (%)	Germplasm	Yellow mite (no./cm² leaf)	Semilooper (%)	Stem rot (CODEX)	Root rot (%)
OIN-01	28.45	17.32	25.73	1.84	OIN-93	6.23	13.15	186.29	2.04
OIN-03	28.08	15.08	24.51	2.59	OIN-94	6.95	13.98	27.58	7.79
OIN-06	7.12	12.69	28.62	5.39	OIN-104	7.87	15.83	40.74	4.65
OIN-09	6.79	15.83	48.45	6.94	OIN-108	7.38	17.78	315.62	7.96
OIN-15	8.07	13.98	25.51	1.17	OIN-111	8.08	14.76	18.00	3.95
OIN-17	8.41	15.56	12.88	3.63	OIN-112	11.71	19.40	28.44	7.36
OIN-18	8.76	14.06	35.91	4.75	OIN-113	8.71	15.32	18.95	4.17
OIN-22	31.84	18.62	117.45	3.28	OIN-116	9.02	13.76	151.00	5.71
OIN-25	10.61	12.53	47.57	3.43	OIN-128	7.08	29.99	105.44	5.76
OIN-30	6.83	17.73	121.56	3.74	OIN-130	8.61	19.69	89.32	6.57
OIN-32	5.79	19.41	183.74	6.13	OIN-133	6.32	22.40	107.71	6.11
OIN-38	9.18	13.77	68.63	7.42	OIN-134	9.66	15.04	115.58	7.70
OIN-40	7.16	17.64	17.09	3.87	OIN-136	8.99	12.40	100.23	7.34
OIN-41	10.01	14.48	142.15	4.32	OIN-138	7.61	27.40	29.09	6.65
OIN-48	8.09	12.93	116.14	8.81	OIN-141	8.68	17.51	58.59	6.35
OIN-49	24.80	15.27	70.78	8.24	OIN-142	9.59	17.73	87.51	7.34
OIN-52	7.36	13.63	192.66	5.93	OIN-145	7.61	19.30	70.74	6.46
OIN-59	10.65	14.09	43.03	6.75	OIN-147	9.32	16.81	86.70	9.52
OIN-60	32.25	13.86	20.32	1.03	OIN-148	6.17	15.17	45.32	8.11
OIN-62	8.68	15.18	40.08	1.43	OIJ-88	25.61	14.67	94.28	8.73
OIN-63	8.46	24.56	132.86	3.44	OIJ-211	9.28	16.99	158.91	7.72
OIN-65	8.99	16.12	111.39	2.47	OIJ-226	9.08	21.10	105.42	6.06
OIN-68	10.88	21.72	28.86	5.21	OIJ-241	8.68	23.03	87.09	9.30
OIN-69	10.09	14.43	9.41	2.21	OIJ-276	10.04	17.73	76.70	9.46
OIN-71	7.47	19.42	13.92	3.54	OIJ-278	9.13	14.58	171.85	4.11
OIN-72	8.48	17.99	67.78	9.31	OIJ-296	10.12	10.20	132.49	8.77
OIN-73	8.38	13.64	153.11	6.94	OEX-05	7.65	21.01	21.97	5.46
OIN-74	30.09	16.32	69.25	5.34	OEX-09	8.63	16.31	54.06	8.61
OIN-76	8.17	16.40	104.41	8.25	OEX-13	8.45	12.94	126.45	6.73
OIN-77	5.67	12.34	44.88	6.48	OEX-29	8.98	13.72	108.49	6.38
OIN-83	9.13	11.83	137.51	6.68	JRO 524+	7.35	18.61	316.85	13.76
OIN-84	11.47	14.31	189.13	4.11	JRO 204 +	10.37	17.26	45.33	7.90
OIN-86	7.09	16.84	97.29	2.34	--	--	--	--	--

YM=Yellow mite (no/cm² area from second unfold leaf); SL=Semilooper (% damage)

Table 3.14: Screening of *capsularis* germplasm against insect pests and diseases at Coochbehar

Germplasm	Yellow mite (no./ cm² leaf)	Semilooper (%)	Stem rot (CODEX)	Root rot (%)	Germplasm	Yellow mite (no./ cm² leaf	Semilooper (%)	Stem rot (CODEX)	Root rot (%)
CIN-02	13.49	15.96	13.63	0.64	CIN-103	12.39	11.63	60.13	2.31
CIN-06	10.42	12.67	15.41	0.00	CIN-105	14.35	15.09	24.11	0.67
CIN-09	10.34	16.91	17.72	0.56	CIN-107	15.38	17.23	64.73	0.58
CIN-10	12.42	13.42	10.80	0.00	CIN-108	16.01	14.71	44.50	1.67
CIN-11	11.13	14.05	19.45	3.57	CIN-116	14.94	11.35	22.92	1.31
CIN-13	13.11	10.97	7.69	0.57	CIN-117	15.79	12.60	23.41	0.00
CIN-15	11.65	14.34	16.50	2.36	CIN-120	14.98	9.15	25.61	2.17
CIN-17	12.06	15.62	44.02	3.08	CIN-123	15.03	9.43	67.52	2.01
CIN-20	12.12	13.35	14.97	0.51	CIN-125	14.71	12.75	66.82	2.51
CIN-26	13.68	9.74	11.22	1.63	CIN-126	15.66	13.11	56.74	1.47
CIN-40	16.04	11.75	32.01	6.23	CIN-130	16.80	15.39	45.45	0.00
CIN-43	14.28	8.01	45.03	4.69	CIN-138	16.35	14.40	13.50	3.74
CIN-45	14.89	12.31	33.57	5.27	CIN-139	14.51	10.38	33.81	0.00
CIN-47	15.00	11.07	19.49	4.04	CIN-142	14.31	13.35	29.88	1.33
CIN-48	12.75	8.46	12.02	3.66	CIN-147	13.34	12.71	28.96	0.00
CIN-50	13.29	12.22	27.25	2.04	CIN-166	10.68	16.07	31.98	0.00
CIN-53	13.12	12.95	26.24	0.00	CIN-179	14.39	12.09	19.23	1.19
CIN-58	11.70	12.04	18.13	2.64	CIN-210	13.74	16.27	44.14	1.58
CIN-59	11.10	13.63	25.57	2.04	CIN-259	14.24	13.41	31.86	0.00
CIN-64	14.78	10.17	3.15	0.98	CEX-10	14.99	16.64	30.96	2.38
CIN-65	13.16	10.07	24.24	2.73	CEX-14	15.01	16.98	107.95	4.77
CIN-67	13.08	12.05	89.80	3.16	CEX-15	16.09	14.34	89.88	2.18
CIN-68	13.28	12.81	22.95	0.00	CEX-22	17.89	15.36	92.85	3.78
CIN-80	12.85	12.49	15.01	2.20	CEX-25	16.72	15.98	82.50	3.19
CIN-81	11.95	10.02	28.75	2.92	CEX-28	11.39	20.69	43.73	1.74
CIN-84	10.67	12.76	39.47	1.33	CEX-33	13.71	13.42	49.69	4.11
CIN-85	12.80	12.31	12.55	0.00	CEX-38	14.10	16.62	27.68	3.12
CIN-86	14.68	18.39	29.43	2.63	CEX-46	13.35	17.00	54.26	2.94
CIN-91	15.83	11.65	20.74	3.97	CEX-51	15.38	13.64	84.61	2.12
CIN-93	13.48	15.10	9.86	4.96	CEX-69	13.01	17.37	59.80	4.18
CIN-94	14.06	15.15	48.81	0.51	JRC 517+	11.34	15.13	178.45	8.89
CIN-99	14.62	16.12	55.76	0.78	JRC 698+	13.73	14.20	84.90	8.51
CIN-101	15.90	15.44	16.26	1.39	--	--	--	--	--

YM=Yellow mite (no/cm² area from second unfold leaf); SL=Semilooper (% damage)

NP (ME) 4.5: Evaluation of mesta germplasm against pests and diseases

Centre Allotted: Amadalavalasa, Coochbehar and Barrackpore

Amadalavalasa: Forty two mesta germplasm were screened against foot and stem rot disease incidence. On the basis of the disease incidence at 60, 90 and 120 DAS, the germplasm line AS 80-19 was least infected (1.8%, 5.5% and 7.3%) with moderately susceptible reaction (table 3.15). The germplasm line, R-48 and AS-80-9 also suffered less disease incidence <8% during all the stages with moderately susceptible reaction compared to 52% in the highly susceptible control AMV 5. On the basis of disease reactions, most of the germplasm (29) showed higher susceptibility towards foot and stem rot at the later crop growth stage (120 DAS). Germplasm AS-80-23 was more susceptible to foot and stem rot than AMV 5 (check) at 90 DAS.

Table 3.15: Incidence of foot and stem rot (%) on different germplasm of *Hibiscus sabdariffa* L. at Amadalvalsa during 2014

Germplasm	Foot and stem rot (%)				Germplasm	Foot and stem rot (%)			
	60 DAS	90 DAS	120 DAS	Disease reaction		60 DAS	90 DAS	120 DAS	Disease reaction
AR-16	8.8	14.1	22.0	HS	ER-14	14.3	15.6	20.6	MS
AR-20	13.2	15.0	18.8	MS	ER-27	7.6	20.9	18.9	MS
AR-40	11.8	17.0	31.6	HS	ER-38	5.5	12.1	16.4	MS
AR-46	5.6	21.8	29.2	HS	ER-43	6.4	9.7	10.6	MS
AR-53	18.0	22.6	25.8	HS	ER-47	6.2	14.6	12.1	HS
AR-66	10.2	19.7	34.7	HS	ER-56	10.0	19.3	16.3	HS
AR-79	8.5	22.4	26.7	HS	ER-67	8.2	12.3	10.0	MS
AR-80	5.8	14.1	14.7	HS	R-16	8.6	16.7	23.5	HS
AR-104	7.0	24.1	29.4	HS	R-48	3.7	6.2	7.8	MS
AR-128	4.6	6.2	10.7	HS	R-77	3.3	10.0	10.2	MS
AS-80-7	8.6	8.9	11.9	HS	R-79	6.9	8.6	12.5	HS
AS-80-9	1.8	7.5	8.1	MS	R-88	8.7	9.9	10.6	HS
AS-80-12	4.6	19.6	25.0	HS	R-96	4.6	6.4	9.2	HS
AS-80-19	1.8	5.5	7.3	MS	R-128	9.3	14.8	18.0	HS
AS-80-23	9.6	33.1	45.2	HS	R-191	16.9	24.1	17.3	MS
AS-80-26	11.3	17.7	23.0	MS	R-225	14.9	14.2	23.9	HS
AS-80-31	6.5	11.8	10.3	HS	R-271	8.1	21.8	24.4	HS
AS-81-5	9.1	15.2	18.8	HS	R-321	9.6	12.6	15.2	HS
AS-81-12	12.8	22.7	24.4	HS	R-347	6.8	13.1	14.3	HS
REX-6	9.7	9.7	10.9	HS	R-127	17.6	28.6	34.3	HS
ER-7	6.2	14.4	13.2	MS	R-129	12.2	15.2	18.8	MS
AMV 5(check)	24.1	32.1	52.0	HS	AMV 5(check)	24.1	32.1	52.0	HS

*DAS-days after sowing, HS-highly susceptible, MS-moderately susceptible

NP (JP) 2.0: Management of stem rot of jute under integrated crop management system

Centre allocated: Kendrapara and Katihar

Kendrapara: Irrespective of other factors the incidence of stem rot was more (331.99) in 15th March sown crop (D_1), compared to less (206.06) in 30th March sown crop (D_2) (table 3.16). The effect of fertilizers was also significant on stem rot incidence, being significantly higher (296.16) in F_1 (60:30:30 NPK) than the higher dosage. Significantly less disease (241.88) was observed in F_2 with 80:40:40 NPK. The effect of the disease management treatment and the interaction was non-significant on stem rot incidence. The main and interaction effect of all the treatments was non-significant on the control of root rot. The main effect of sowing time, fertilizer application and disease management on fibre yield was significant. Interaction D_1F_2 P_2 resulted in maximum fibre yield (29.45 q/ha). All the pest management module had significant effect on fibre yield.

Table 3.16: Effect of various integrated treatments on the incidence of stem rot and root rot of jute and its fibre yield at Kendrapara during 2014

Treatments	Stem rot (codex)			Root rot (%)			Fibre yield(q/ha)		
	P_1	P_2	P_3	P_1	P_2	P_3	P_1	P_2	P_3
D_1F_1*	359.00	477.50	354.97	12.59	9.62	9.62	20.43	18.84	19.29
D_1F_2	515.50	174.62	110.37	8.88	6.66	13.32	17.72	29.45	18.51
D_2F_1	214.92	119.62	251.00	11.10	6.66	8.88	24.98	19.50	24.25
D_2F_2	267.29	283.50	100.04	8.14	5.92	11.84	18.98	26.43	19.88
Mean	D_1= 331.99	F_1=296.16	P_1=339.10	D_1=10.11	F_1=9.74	P_1=10.17	D_1= 20.70	F_1=21.21	P_1=20.53
	D_2= 206.06	F_2=241.88	P_2=263.80	D_2= 8.75	F_2=9.12	P_2=7.21	D_2= 22.33	F_2=21.82	P_2=23.56
	-	-	P_3=204.09	-	-	P_3=10.91	-	-	P_3=20.48
CD(P=0.05)	D=65.92 (S)			D= 2.69 (NS)			D=1.84 (S)		
	F=65.92 (S)			F= 2.69 (NS)			F=1.84 (S)		
	P=80.74 (NS)			P= 3.3 (NS)			P=2.25 (S)		
	DXPXF=161.48 (NS)			DXPXF= 6.6 (NS)			DXPXF=4.51 (S)		

*D_1=15 March, D_2=30 March, F_1=NPK- 60:30:30 , F_2= N:P:K-80:40:40, P_1= seed treatment with *T. viride* @10g/kg seed + Butachlor 50 EC 2kg a.i. /ha as pre-emergence + spraying of neem oil, P_2= seed treatment with *T. viride* @10g/kg + Butachlor 2kg a.i. /ha as pre-emergence + spraying of carbendazim 50 WP @ 0.1% + spraying of endosulfan 35 EC @ 0.15% at 15 days interval with onset of pests and disease , P3= control

Katihar: The disease incidence was too less to draw any conclusion on the efficacy of the treatments.

NP (JE) 6.3. Effect of date of sowing and insecticides against insect pests of jute

Centres allotted: Barrackpore, Nagaon, Coochbehar, Kendrapara and Katihar

Barrackpore: The effect of treatments (dates of sowing and insecticides) and their interaction was significant on mite population recorded at different intervals (table 3.17). In the early stage of the crop i.e. 45 DAS the effect of date of sowing (DoS) on mite infestation was non-significant. However, in subsequent crop growth stages the early sown crop harboured significantly less mite

i.e. 6.23,38.36,4.94, 42.04 and 3.75 per cm^2 leaf area at 52, 60, 67, 75 and 82 DAS respectively compared to late sown crop. The post treatment observations after 52 DAS indicated significantly less number of mite (7.03 per cm^2 leaf area) in abamectin 1.8 EC (0.0015%) followed by dicofol 18.5 EC (0.045%) compared to control and fenazaquin treated crop. The superiority of abamectin 1.8 EC on suppressing the mite population was also prominent at 60 DAS with significantly least population of 10.06 mites/cm^2 leaf area at 7 DAT (67 DAS) compared to 33.83 mites/ cm^2 leaf area in control. Significant mite population reduction in abamectin and dicofol treatments persisted till 82 DAS. The early sown crop also suffered less from semilooper damage except at 77 DAS, prior to which the 15th March sown crop was less infested (table 3.18). During both the post treatment observations, lambda cyhalothrin 5EC (0.003%) and quinalphos 25 EC (0.04%) were more effective than the control and profenophos treatment. The effect of the treatments on fibre yield indicated that application of abamectin 1.8 EC was the best treatment with highest yield (27.83 q/ha). The main effect of date of sowing indicated more yield (26.31 q/ ha) in 15th March sown crop. The fibre yield of earlier sown (15th March) crop with foliar spray of abamectin 1.8 EC (0.0015%) and profenophos 50 EC (0.1%) resulted in significantly higher fibre yield (30.34 q/ ha) (Table 3.18).

Nagaon: First date of sowing (20.4.14) showed higher plant infestation and yellow mite population except at 90 DAS. The treatment T_2 (fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS) showed best control of yellow mite population and plant infestation after both 3 and 7 DAT (table 3.19). Semilooper infestation was higher in second date of sowing (20.5.14) during 70 days of crop stage (table 3.21). Treatment (I_2) with profenophos 50 EC (0.1%) gave significantly higher control of semilooper followed by I_1. Interaction of date of sowing and insecticide was not sifnificant. Date of sowing had significant effect on plant damage by Bihar hairy caterpillar. During 70 days of crop stage, first sown crop (20.4.14) showed higher plant infestation by Bihar hairy caterpillar (25.11%) and during 80 day old crop, second date of sowing (20.5.14) was more infested by Bihar hairy caterpillar (28.99%) (table 3.22). Treatment (I_2) showed highest reduction in plant damage caused by BHC followed by I_1 during both at 70 and 80 DAS spraying. Crop sown on D_1 (20.4.14) resulted in significantly higher yield (26.83 q/ha) and plant height (237.77 cm) while date of sowing and insecticide had no significant effect on basal diameter of the crop (table 3.23). Significantly higher yield and plant height were also resulted from use of insecticides. The treatment T_2 was best both in terms of pest control and yield. Under Nagaon condition sowing of jute in the third week of March protected with fenazaquin 5EC (0.015%) at 45 and 60DAS and profenophos 50 EC (0.1%) at 70 and 80 DAS is most ideal for reducing the pet infestation and fetching the yield to the maximum extent.

Coochbehar: All the pesticide treatments were superior over control for suppression of mite population and for fiber yield. At 45 DAS significant difference of mite population was noticed among the crops sown on different dates (table 3.24). The early sown crop was less infested with yellow mite. At 3 day post treatment of 1st application of pesticides, significant differences were found among insecticidal treatments and significantly least mite infestation was recorded in I_1 and I_2. At 3 day after 2nd spray significant difference was among the insecticidal treatments with least population in I_1 and I_2. On 3 day after of 3rd application of pesticides, significant difference was noticed among the treatment and time of sowning also. In considering the yield parameter, significant difference was noticed in between treatment and sowing time. The early sown crop sprayed with fenazaquin and profenophos recorded maximum plant height 276.73 cm and yield (31.60 q/ha) (table 3.25).

Kendrapara: The results revealed that the mite population was least in 2nd date of sowing as compared to 1st date of sowing. At 48 DAS (3 DAT), I_2 (Fenazaquin 10 EC @ 0.015%) reduced the mite population (2.02 mite/cm^2) over control and it was significantly different than all other treatments which were followed by I_1 (2.73 mite/cm^2) and I_3 (3.30 mite/cm^2). Relative efficacy

of the treatments was same at 63 DAS (table 3.26). In case of semilooper, the foliar spray of lamda cyahalothrin 5 EC @ 0.0030% reduced plant damage significantly (3.45%) at 77 DAS and also same trend was observed (2.83%) at 87 DAS (table 3.27). Highest fibre yield of 26.81 q/ha in I_2 followed by 25.32 q/ha in I_1 was recorded (table 3.28). However from the interaction of date of sowing and insecticide treatments it was revealed all the insecticide treatments recorded were significantly higher yield over control.

Katihar: All the acaricides recorded significant effect on reducing the mite population during peak period of 48 and 63 DAS. During both the post treatment observations (48 and 63 DAS) significantly least mite population was recorded in I_3 being at par with I_1 (table 3.29). The performance of abamectin 1.8 EC was better than other acaricides. Sowing time and its interaction with acaricides had significant impact on mite infestation. The plant damage caused by semilooper and Bihar hairy caterpillar was significantly low in lamda cyhalothrin treatment which recorded 1.83 and 0.83% plant damage at 77 and 91 DAS to 3.50 and 4.00% damage respectively in control (table 3.30 & 3.31).

Table 3.17: Effect of insecticides and sowing time on mite population (no./sq cm in second unfolded leaf) at different DAS at Barrackpore during 2014

Treatment	45 DAS (Pre)			52 DAS (Post)			60 DAS (Pre)			67 DAS (Post)			75 DAS (Pre)			82 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	53.40	63.10	58.25	6.26	7.83	7.05	47.27	39.00	43.13	4.60	4.03	4.31	48.36	42.40	45.88	4.93	5.56	5.25
I_2	52.33	61.50	56.91	6.33	83.21	44.77	19.60	89.00	54.30	2.46	93.56	48.01	31.16	86.23	58.70	2.33	102.50	52.41
I_3	46.46	52.36	49.41	8.26	5.80	7.03	49.76	38.80	44.28	7.30	12.83	10.06	49.93	30.73	40.33	5.80	5.10	5.45
I_4	39.86	48.10	43.98	4.06	48.66	26.36	36.83	54.30	45.56	5.40	62.26	33.83	38.70	56.86	47.78	1.96	85.30	43.63
Mean	48.01	56.26	--	6.23	36.37	--	38.36	55.27	--	4.94	43.17	--	42.04	54.05	--	3.75	49.61	--
CD (P=0.05)	D=NS, I=3.43, DxI=3.69			D=8.85, I=3.90, DxI=3.67			D=9.56, I=5.06, DxI=3.99			D=9.36, I=4.33, DxI=3.89			D=8.96, I=4.17, DxI=3.73			D=5.30, I=1.97, DxI=2.20		

D1= DoS: 15th March, D2= DoS: 15th April, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.18: Effect of insecticides and sowing time on semilooper infestation (%) and fibre yield at Barrackpore during 2014

Treatment	60 DAS (Pre)			67 DAS (Post)			70 DAS (Pre)			77 DAS (Post)			Yield		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	6.43	12.36	9.40	6.83	9.86	8.35	10.93	10.46	10.77	9.56	8.33	8.95	27.87	26.89	27.38
I_2	9.56	7.08	13.32	6.96	18.03	12.50	15.26	25.66	20.46	8.50	27.13	17.81	30.34	25.33	24.34
I_3	7.53	10.16	8.85	6.29	7.86	7.08	14.26	10.10	12.18	9.33	8.60	8.96	24.69	23.99	27.83
I_4	7.81	15.80	11.80	4.70	17.40	11.05	17.40	17.76	17.58	11.80	22.23	17.01	22.34	22.90	22.62
Mean	7.83	13.85	--	6.20	13.29	--	14.46	16.00	--	9.80	16.57	--	26.31	24.78	--
CD (P=0.05)	D=4.46, I=2.32, DxI=1.86			D=5.18, I=2.52, DxI=2.15			D=5.67, I=2.48, DxI=2.36			D=4.80, I=2.12, DxI=2.00			D=4.20, I=2.50, DxI=1.74		

D1= DoS: 15th March, D2= DoS: 15th April, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.19 : Effect of insecticides and sowing time on mite infestation (%) at different DAS at Nagaon during 2014

Treatment	45 DAS (Pre)			48 DAS (Post)			60 DAS (Pre)			63 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	18.68	12.48	15.58	9.32	7.46	8.39	6.48	4.66	5.57	1.61	1.62	1.62
I_2	23.49	16.96	20.23	4.66	2.46	3.56	2.63	5.00	3.82	1.23	1.21	1.22
I_3	16.72	10.62	13.67	10.42	8.28	9.35	7.42	6.28	6.85	4.16	5.16	4.66
I_4	16.94	13.44	15.19	18.72	16.4	17.56	11.26	10.38	10.82	11.76	11.73	11.73
Mean	18.96	13.38	--	10.78	8.65	--	6.95	6.58	--	4.38	4.63	--
CD (P=0.05)	D=1.78, I=2.52, DxI=NS			D=2.16, I=3.05, DxI=NS			D=NS, I=3.61, DxI=NS			D=NS, I=2.75, DxI=NS		

D1= DoS: 20th April, D2= DoS: 20th May, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.20: Effect of insecticides and sowing time on mite population (no./sq cm in second unfolded leaf) at different DAS at Nagaon during 2014

Treatment	75 DAS (Pre)			78 DAS (Post)			90 DAS (Pre)			93 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	14.46	10.68	12.57	6.30	8.46	7.38	10.68	15.29	12.99	5.00	7.48	6.24
I_2	17.30	13.64	15.47	5.26	2.84	4.05	13.46	14.92	14.19	4.26	3.26	3.76
I_3	18.76	11.84	15.30	10.32	7.68	9.00	11.43	20.48	15.96	8.48	11.26	9.87
I_4	18.62	14.62	16.62	17.48	19.46	18.47	10.73	18.42	14.58	11.64	16.28	13.96
Mean	17.29	12.70	--	9.84	9.61	--	11.58	17.28	--	7.35	9.57	--
CD (P=0.05)	D=2.7, I=NS, DxI=NS			D=NS, I=3.09, DxI=NS			D=2.5, I=NS, DxI=NS			D=1.63, I=2.31, DxI=NS		

D_1= DoS: 20th April, D_2= DoS: 20th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.21: Effect of insecticides and sowing time on semilooper infestation (%) at different DAS at Nagaon during 2014

Treatment	70 DAS (Pre)			77 DAS (Post)			80 DAS (Pre)			87 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	21.42	29.03	25.22	9.68	12.64	11.16	13.92	16.88	15.40	7.82	5.29	6.56
I_2	28.78	36.42	32.63	6.48	9.76	8.12	11.47	10.42	10.95	5.26	6.48	5.87
I_3	30.46	36.92	33.69	11.43	18.78	15.11	12.46	14.42	13.44	9.40	10.22	9.81
I_4	25.88	33.43	29.66	30.46	37.66	34.06	33.86	38.36	36.11	34.28	30.20	32.24
Mean	26.64	33.96	--	14.51	19.71	--	17.93	20.02	--	14.19	13.05	--
CD (P=0.05)	D=2.09, I=NS, DxI=NS			D=1.59, I=2.26, DxI=NS			D=NS, I=2.43, DxI=NS			D=NS, I=2.78, DxI=NS		

D1= DoS: 20th April, D2= DoS: 20th May, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.22: Effect of insecticides and sowing time on Bihar hairy caterpillar infestation (%) at different DAS at Nagaon during 2014

Treatment	70 DAS (Pre)			77 DAS (Post)			80 DAS (Pre)			87 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	21.48	17.42	19.45	9.28	11.44	10.36	12.48	22.36	17.42	6.78	10.58	8.68
I_2	29.69	19.28	24.48	4.32	8.42	6.37	11.80	8.34	10.06	1.72	4.68	3.21
I_3	22.48	19.26	20.87	15.26	10.94	13.11	18.53	20.72	19.63	13.42	8.78	11.13
I_4	26.78	17.96	22.37	32.64	21.99	27.31	52.76	64.56	58.66	62.76	68.48	65.62
Mean	25.11	18.48	--	15.37	13.19	--	23.89	28.99	--	21.17	23.13	--
CD (P=0.05)	D=1.83, I=NS, DxI=NS			D=NS, I=5.61, DxI=NS			D=1.50, I=2.13, DxI=NS			D=1.54, I=2.18, DxI=3.09		

D1= DoS: 20th April, D2= DoS: 20th May, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.23: Effect of insecticides and sowing time on jute fibre yield (q/ha), plant height (cm) and basal diameter (cm) at different DAS at Nagaon during 2014

Treatment	Fibre yield (q/ha)			Plant height (cm)			Basal diameter (cm)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	28.80	27.47	28.13	219.27	210.13	214.70	1.51	1.63	1.57
I_2	31.60	29.51	30.55	276.73	233.43	255.08	1.62	1.63	1.63
I_3	27.46	23.30	25.38	257.33	218.33	237.83	1.57	1.60	1.59
I_4	19.43	17.80	18.62	197.73	170.47	184.12	1.56	1.54	1.55
Mean	26.83	24.52	--	237.77	208.09	--	1.57	1.60	--
CD (P=0.05)	D=1.48, I=2.09, DxI=NS			D=18.87, I=26.69, DxI=NS			D=NS, I=NS, DxI=NS		

D_1= DoS: 20th April, D_2= DoS: 20th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.24: Effect of insecticides and sowing time on mite population (no. /sq cm in second unfolded leaf) at different DAS at Coochbehar during 2014

Treatment	45 DAS (Pre)			48 DAS (Post)			60 DAS (Pre)			63 DAS (Post)			75 DAS (Pre)			78 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	12.10	23.57	17.83	3.10	4.23	3.66	30.97	31.27	31.11	6.63	7.50	7.06	10.40	11.57	10.98	3.20	4.37	3.78
I_2	11.53	18.70	15.11	3.83	5.33	4.58	30.03	32.80	31.41	8.63	7.47	8.05	8.23	10.67	9.45	2.57	3.03	2.80
I_3	13.50	21.87	17.68	6.30	8.87	7.58	32.30	30.50	31.40	12.40	10.97	11.68	10.00	13.13	11.56	3.77	4.43	4.10
I_4	13.33	18.87	16.10	19.70	26.27	22.98	31.03	29.27	30.15	30.43	36.13	33.28	8.83	11.73	10.38	12.23	15.10	13.67
Mean	12.61	20.75	--	8.23	11.17	--	31.08	30.95	--	14.52	15.51	--	9.36	11.82	--	5.44	6.73	--
CD (P=0.05)	D=2.24, I=NS,DxI=NS			D=1.74, I=2.4DxI=NS			D=NS, I=NS, DxI=NS			D=NS, I=3.97, DxI=NS			D=1.15, I=NS, DxI=NS			D=0.91, I=1.29, DxI=NS		

D_1= DoS: 11th April, D_2= DoS: 12th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.25: Effect of insecticides and sowing time on fibre yield (q/ha) at different DAS at Coochbehar during 2014

Treatment	Plant height (cm)			Basal diameter (cm)			Fibre yield (q/ha)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	238.55	172.62	205.58	11.177	10.427	10.80	34.72	30.47	32.59
I_2	243.98	181.85	212.91	11.109	10.157	10.63	36.18	31.76	33.96
I_3	239.97	176.18	208.07	11.110	10.386	10.74	32.20	30.61	31.40
I_4	222.18	153.58	187.88	10.725	10.262	10.49	30.17	27.24	28.70
Mean	236.17	171.06	--	11.03	10.30	--	33.31	30.01	--
CD (P=0.05)	D=8.45, I=11.95, DXI=NS			D=0.23 I=NS, DXI=NS			D=1.15 , I= 1.62 DXI=NS		

D_1= DoS: 11th April, D_2= DoS: 12th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 =fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.26: Effect of insecticides and sowing time on mite population (no. /sq cm in second unfolded leaf) at different DAS at Kendrapara during 2014

Treatment	45 DAS (Pre)			48 DAS (Post)			60 DAS (Pre)			63 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	9.43	3.93	6.68	3.73	1.73	2.73	2.93	1.10	2.02	1.27	0	0.63
I_2	8.73	3.70	6.22	2.67	1.37	2.02	2.27	0.53	1.40	1.03	0	0.52
I_3	8.83	3.50	6.17	4.27	2.33	3.30	4.10	1.80	2.95	1.73	0.4	1.07
I_4	8.97	4.10	6.53	11.27	5.27	8.27	11.83	3.20	7.52	3.6	1.23	2.42
Mean	8.99	3.81	--	5.48	2.68	--	5.28	1.66	--	1.91	0.41	--
CD (P=0.05)	D=0.65, I=0.91, DxI=1.29			D=0.36, I=0.51, DxI=0.72			D=0.30, I=0.43, DxI=0.61			D=0.13, I=0.18, DxI=0.25		

D_1= DoS: 3rd April, D_2= DoS: 7th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 =fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.27: Effect of insecticides and sowing time on semilooper infestation (%) at different DAS at Kendrapara during 2014

Treatment	70 DAS (Pre)			77 DAS (Post)			80 DAS (Pre)			87 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	9.43	12.63	11.03	4.13	6.63	5.38	6.47	7.67	7.07	4.37	6.60	5.48
I_2	8.60	11.97	10.28	3.53	4.80	4.17	5.07	5.27	5.17	3.50	4.10	3.80
I_3	8.00	11.37	9.68	2.93	3.97	3.45	4.57	4.43	4.50	2.70	2.97	2.83
I_4	8.33	9.93	9.13	13.77	15.43	14.60	16.43	18.47	17.45	18.47	21.33	19.90
Mean	8.59	11.48	--	6.09	7.71	--	8.13	8.96	--	7.26	8.75	--
CD (P=0.05)	D=1.02, I=1.44, DxI=2.04			D=0.65, I=0.92, DxI=1.31			D=0.91, I=1.28, DxI=1.82			D=0.79, I=1.11, DxI=1.57		

D_1= DoS: 3rd April, D_2= DoS: 7th May, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 =fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

Table 3.28: Effect of insecticides and sowing time on fibre yield (q/ha), plant height (cm) and basal diameter (cm) at different DAS at Kendrapara during 2014

Treatment	Plant height (cm)			Basal diameter (cm)			Fibre yield (q/ha)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	366.67	296.67	331.67	1.53	1.52	1.53	26.57	24.07	25.32
I_2	416.67	340.00	378.33	1.92	1.77	1.84	28.15	25.46	26.81
I_3	335.00	256.67	295.83	1.38	1.39	1.39	24.35	23.15	23.75
I_4	286.67	236.67	261.67	1.26	1.22	1.24	21.67	19.35	20.51
Mean	351.25	282.50	--	1.52	1.47	--	25.19	23.01	--
CD (P=0.05)	D=30.49, I=43.12, DxI=60.98			D=0.17, I=0.23, DxI=0.33			D=2.67, I=3.78 DxI=5.34		

D1= DoS: 3rd April, D2= DoS: 7th May, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 =fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.29: Effect of insecticides and sowing time on mite population (no. /sq. cm in second unfolded leaf) at different DAS at Katihar during 2014

Treatment	45 DAS (Pre)			48 DAS (Post)			60 DAS (Pre)			63 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	67.63	53.90	60.76	16.93	14.16	15.55	54.43	44.30	49.36	7.43	9.10	8.26
I_2	59.10	62.80	60.95	4.06	75.13	39.60	29.06	95.73	62.40	0.90	102.43	51.67
I_3	62.63	58.76	60.70	13.96	13.53	13.75	50.76	44.50	47.63	7.20	6.73	6.97
I_4	58.16	57.70	57.93	3.70	72.40	38.05	30.20	92.50	61.38	0.00	102.36	51.18
Mean	61.88	58.29	--	9.66	43.80	--	41.11	69.27	--	3.88	55.15	--
CD (P=0.05)	D=6.70, I=2.25, DxI=2.78			D=4.82, I=2.27, DxI=2.02			D=4.43, I=8.59, DxI=3.57			D=8.92, I=3.61, DxI=3.71		

D1= DoS: 11th May, D2= DoS: 9th June, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.30: Effect of insecticides and sowing time on semilooper infestation (%) at different DAS at Katihar during 2014

Treatment	70 DAS (Pre)			77 DAS (Post)			84 DAS (Pre)			91 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	2.66	2.33	2.50	1.00	1.00	1.0	2.33	2.00	2.16	0.33	0.33	0.33
I_2	3.00	3.00	3.00	0.00	3.33	1.66	1.00	3.66	2.33	0.00	4.00	2.00
I_3	2.00	2.00	2.00	0.66	0.00	0.33	1.66	1.66	1.66	0.33	0.66	0.50
I_4	2.00	2.00	2.00	0.00	3.00	1.55	1.00	3.33	2.16	0.00	4.00	2.00
Mean	2.41	2.33	--	0.41	1.83	--	1.5	2.66	--	0.16	2.25	--
CD (P=0.05)	D=1.09, I=0.70, DxI=0.49			D=1.41, I=0.62, DxI=0.60			D=1.90, I=0.87, DxI=0.78			D=2.19, I=0.76, DxI=0.91		

D1= DoS: 11th May, D2= DoS: 9th June, I1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I4= control.

Table 3.31: Effect of insecticides and sowing time on Bihar hairy caterpillar infestation (%) at different DAS at Katihar during 2014

Treatment	70 DAS (Pre)			77 DAS (Post)			84 DAS (Pre)			91 DAS (Post)		
	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean	D_1	D_2	Mean
I_1	7.66	8.00	7.83	2.66	2.00	2.33	3.66	3.66	3.66	1.00	0.66	0.83
I_2	7.66	8.00	7.83	1.00	7.33	4.16	2.00	7.33	4.66	0.00	8.00	4.00
I_3	7.33	7.00	7.16	2.00	1.66	1.83	3.66	3.33	3.50	0.67	1.00	0.83
I_4	8.00	7.33	7.66	0.66	6.33	3.50	1.66	8.00	4.83	0.00	8.00	4.00
Mean	7.66	7.58	--	1.58	4.33	--	2.75	5.58	--	0.41	4.41	--
CD (P=0.05)	D=2.19, I=1.26, DxI=0.91			D=2.37, I=1.07, DxI=0.98			D=2.53, I=1.05, DxI=0.30			D=3.41, I=1.32, DxI=1.41		

D_1= DoS: 11th May, D_2= DoS: 9th June, I_1 =dicofol 18.5 EC @ 0.045% at 45 and 60 DAS and quinalphos 25 EC @ 0.04% at 70 and 80 DAS, I_2 = fenazaquin 10 EC @ 0.015% at 45 and 60 DAS and profenophos 50 EC @ 0.10% at 70 and 80 DAS, I_3 = abamectin 1.8 EC @ 0.0015% at 45 and 60 DAS and lamda cyahalothrin 5EC @ 0.0030% at 70 and 80 DAS, I_4= control.

NP (JP) 2.10: Evaluation of elite *olitorius* jute lines against stem rot under challenged inoculations

Centres allotted: Coochbehar and Barrackpore

Coochbehar: Eight elite *olitorius* jute entries were evaluated against stem rot under challenged inoculation. During the early stage, significantly less disease incidence was recorded in OIN-270, OEX-15, OIN-853 and OIN-154 with mean PDI of 2.25, 2.29, 3.26 and 3.80 respectively till 60 DAS (table 3.32). At 90 DAS there was increase in the incidence which indicated OEX-15 and OIN-270 to be relatively most resistant among the lot with significantly less (4.16 and 4.36 PDI respectively) disease.

Table 3.32: Evaluation of elite *olitorius* jute lines against stem rot under challenged inoculations at Coochbehar during 2014

Germplasm	Stem rot (PDI)			
	45 DAS	60 DAS	75 DAS	90 DAS
OIN- 853	1.72	3.26	5.76	8.31
OIN- 932	2.23	4.66	7.62	10.14
OIJ- 150	2.18	4.78	7.48	9.91
OIN- 467	3.27	5.02	6.87	9.43
OEX- 15	1.25	2.29	3.24	4.16
OIN -154	1.73	3.80	5.86	7.21
OIN- 651	3.16	5.41	7.69	11.22
OIN- 270	1.08	2.25	3.16	4.36
CD (P=0.05)	1.4	1.54	1.83	2.11

Barrackpore: Out of total 28 lines evaluated, JRC-412 showed highest PDI of 39.7 which was most susceptible. Only four lines showed PDI less than 5.0, they were OIN-125, OIN-651, OIN-853 and OIN-154 with PDI of 2.75, 4.18, 2.73 and 4.23 respectively (table 3.33). These lines may be regarded as resistant to stem rot of jute. Lines exhibiting PDI between 5.1 to 10.0 were CIN-362, JRC-80, CIN-358, CIN-360, OIN-467, CIM-10, CIN-371, JRC-4444, CIN-439 and OIN-110. Their PDI values were 6.77, 7.60, 6.28, 7.81, 5.66, 5.80, 7.60, 9.55, 6.28 and 7.81, respectively. Remaining 14 lines were susceptible to jute stem rot as they showed PDI higher than 10. In term of percentage, only 14.28 % of lines were resistant to stem rot. The PDI values were between 5–10 in 35.71 % of the lines tested. Most of the entries, (53.57 %) were susceptible to stem rot showing PDI of more than 10.

Table 3.33: Evaluation of elite *olitorius* jute lines against stem rot under challenged inoculations at Barrackpore locations during 2014

Germplasm	Stem rot (PDI)	Germplasm	Stem rot (PDI)
JRC-412	39.70	OEX - 015	20.42
OIN - 125	2.75	OIN - 932	11.84
OIN - 651	4.18	CIN - 212	27.60
OEX - 027	26.04	OIN - 467	5.66
OIN - 853	2.73	CIM - 036	16.53
JRC - 321	16.53	CIM -10	5.80
CIN - 362	6.77	CIM - 386	14.19
OIN - 154	4.23	CIM - 64	14.21
OIN - 270	12.25	CIN - 371	7.60
JRC- 80	7.60	JRC - 4444	9.55
OIN - 932	24.36	OIJ - 52	24.36
CIN - 358	6.28	CIN - 439	6.28
OIN - 439	67.31	OIJ - 150	18.56
CIN - 360	7.81	OIN - 110	7.81

NP (JPE) 2.20: Eco-friendly management of major insect pests and diseases in jute

Centres allotted: Barrackpore, Coochbehar, Nagaon, Katihar and Kendrapara

Barrackpore: Experimentation at CRIJAF farm revealed that the effects of the crop management modules on plant height, infestation of stem weevil, semilooper and fibre yield was non-significant. The treatments made significant reduction of stem rot only. The lowest incidence of stem rot was recorded in T_3 (3.87%) and T_5 (4.12%) (table 3.34). The stem rot incidence in the check (untreated) was 12.45% consisting of 50% N: P: K, *Azotobacter* and PSB@ 5g/kg seed along with application of *Pseudomonas fluorescens,* neem oil and IAA. The highest fibre yield (33.50q/h) and plant height (382.33cm) were recorded in T_6 followed by T_5 (fibre yield 32.40 q/h and plant height 380.67 cm) wherein FYM was applied. The treatments did not affect stem weevil infestation, however, semilooper infestation was lower in treatments (T_1 and T_2) wherein chemical pesticides were applied.

Table 3.34: Effect of the bio-pesticides and organic manure treatments on insect pest and disease incidence and fibre yield of jute at Barrackpore during 2014

Treatments	Infestation/incidence (%)			Yield (q/h)	Plant height (cm)
	Stem weevil	Semilooper	Stem rot		
T_1	3.89	6.78	5.23	31.72	378.33
T_2	5.66	5.66	9.79	29.51	375.00
T_3	7.89	9.83	3.87	28.33	372.67
T_4	6.33	10.58	11.35	30.26	376.00
T_5	10.55	12.60	4.12	32.40	380.67
T_6	12.56	11.36	10.37	33.50	382.33
T_7	9.38	15.37	12.45	24.05	363.67
CD (P=0.05)	NS	NS	1.1	NS	NS

T_1 : NPK @ 60:30:30 +seed treatment with carbendazim 50 % WP @ 2g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_2: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/Kg + PSB 5g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_3:50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% @ 45 DAS + neem oil @0.03%; T_4: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_5: FYM @ 5t/ha + seed treatment with *Azotobactor* 5g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% @ 45 DAS + neem oil @ 0.03%; T_6: FYM @ 5 t/ha + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_7: control.

Coochbehar: Among the different treatments, crop protection module (T_1) with inorganic fertilizers, fungicides and insecticides was found most effective against yellow mite and reduced infestation (2.53%) in second unfolded leaf as well as enhancing fibre yield (26.65 q/ha) in comparison to untreated control (table 3.35). Likewise, treatment (T_5) comprising organic manure, seed treatment with microbial inoculants and bioagents, foliar spray with *Pseudomonas fluorescens* and neem oil was superior to rest of the treatments in reducing stem rot incidence (5.22%) and at par with T_3 and T_6. However, treatment (T_3) with combination of inorganic fertilizer, microbial inoculants and bio agents was found effective against root rot incidence (0.95%). Although, T_1 recorded comparatively high disease incidence, it demonstrated significant reduction in mite infestation and maximum yield (26.65 q/ha) followed by T_3 (25.35 q/ha) and T_6 (24.68 q/ha).

Nagaon: Treatment (T_2) consisting of inorganic fertilizer, seed treatment with bio inoculants, fungicides and insecticides was most effective to minimize infestation of yellow mite and semilooper (3.73 mites/ cm^2 of leaf and 7.63%, respectively) (table 3.36). However, bioinoculants protection module with FYM, *Azotobactor*, PSB, *Trichoderma* and *P. fluorescens* and neem oil significantly reduced the stem rot (0.36%) and root rot (1.39%) incidence and enhanced the yield (30.06 q/ha).

Kendrapara: Treatment (T_2) including inorganic fertilizer, bio inoculants, fungicides and insecticides showed least infestation of yellow mite and semilooper (1.93 mites/cm^2 of leaf and 2.73%, respectively) (table 3.37). Whereas, bio inoculants protection module (T_5) combined organic manure, bio inoculants and bio agents was found most effective in reducing the incidence of root rot (14.64%) with enhanced fibre yield (29.31 q/ha).

Table 3.35: Effect of the bio-pesticides and organic manure treatments on insect pest and disease incidence and fibre yield of jute at Coochbehar during 2014

Treatments	Yellow mite (no./cm²)		Incidence (%) of disease		Yield (q/ha)
	Pre-count	3 DAT	Stem rot	Root rot	
T_1	14.86	2.53	12.19	1.35	26.65
T_2	15.66	3.03	7.33	1.51	21.21
T_3	20.28	4.04	5.65	0.95	25.35
T_4	15.25	10.32	9.45	2.26	22.58
T_5	17.09	4.19	5.22	1.19	23.71
T_6	16.00	8.96	5.35	1.84	24.68
T_7	18.43	23.19	22.15	3.34	19.43
CD(P= 0.05)	1.58	1.31	2.21	0.58	0.80

T_1 : NPK @ 60:30:30 +seed treatment with carbendazim 50 % WP @ 2g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_2: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/Kg + PSB 5g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_3:50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% @ 45 DAS + neem oil @0.03%; T_4: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_5: FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% @ 45 DAS + neem oil @ 0.03%; T_6: FYM @ 5 t/ha + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_7: control.

Table 3.36: Effect of the bio-pesticides and organic manure treatments on insect pest and disease incidence and fibre yield of jute at Nagaon during 2014

Treatments	Yellow mite (no./cm²)		Infestation/ incidence(%) of insect/disease				Yield (q/h)
			Semilooper		Stem rot	Root rot	
	Pre-count (45 DAS)	Post count (3 DAT)	Pre count (65 DAS)	Post count (7 DAT)			
T_1	12.56	4.53	17.43	9.66	1.60	3.62	28.30
T_2	11.93	3.73	16.00	7.63	3.18	5.98	24.86
T_3	15.73	12.43	16.40	12.33	0.76	2.69	29.73
T_4	18.93	17.70	16.00	18.73	2.14	6.72	25.43
T_5	11.23	9.73	17.93	26.13	0.36	1.39	30.06
T_6	17.40	18.10	14.03	23.86	1.82	4.22	24.76
T_7	13.86	17.13	18.10	21.43	6.18	13.84	18.50
CD (P= 0.05)	1.94	1.52	1.95	1.54	0.28	0.51	1.37

T_1 : NPK @ 60:30:30 +seed treatment with carbendazim 50 % WP @ 2g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_2: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/Kg + PSB 5g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_3:50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% @ 45 DAS + neem oil @0.03%; T_4: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_5: FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% @ 45 DAS + neem oil @ 0.03%; T_6: FYM @ 5t/ha + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_7: control.

Table 3.37: Effect of the bio-pesticides and organic manure treatments on insect pest and disease incidence and fibre yield of jute at Kendrapara during 2014

Treatments	Yellow mite (no./cm²)		Infestation/ incidence(%) of insect/disease			
			Semilooper			
	Pre-count (45 DAS)	Post –count (3 DAT)	Pre-count (65 DAS)	Post-count (7 DAT)	Root rot	Yield (q/h)
T_1	5.10	2.16	6.76	3.13	23.62	25.08
T_2	4.96	1.93	6.43	2.73	22.33	25.70
T_3	7.83	3.20	5.20	4.76	20.25	28.06
T_4	8.30	7.20	6.16	7.03	22.72	25.66
T_5	7.90	2.93	4.83	4.46	14.66	29.31
T_6	8.50	7.50	5.60	6.63	22.15	26.73
T_7	11.26	13.46	10.06	14.10	32.66	19.80
CD (P= 0.05)	1.04	0.90	1.04	0.97	2.51	1.81

T_1 : NPK @ 60:30:30 +seed treatment with carbendazim 50 % WP @ 2g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_2: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/Kg + PSB 5g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_3:50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% @ 45 DAS + neem oil @0.03%; T_4: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_5: FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% @ 45 DAS + neem oil @ 0.03%; T_6: FYM @ 5 t/ha + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_7: control.

Katihar: Treatment (T_6) consisting of organic manure, antagonists and growth regulators showed least infestation of yellow mite (4.33 mites /cm² of leaf) and semilooper (2.33%) (table 3.38). Treatment (T_3) with combination of reduced inorganic fertilizer, bio inoculants, bioagents and botanicals was most effective against stem rot and root rot incidence (2.51% and 1.98% respectively) as well as higher fibre yield (22.63 q/ha).

Table 3.38: Effect of the bio-pesticides and organic manure treatments on insect pest and disease incidence and fibre yield of jute at Katihar during 2014

Treatments	Yellow mite (no./cm²)		Infestation/ incidence (%) of insect/disease				Yield (q/h)
			Semilooper		Stem rot	Root rot	
	Pre count (45 DAS)	Post count (3 DAT)	Pre count (65 DAS)	Post count (7 DAT)			
T_1	71.66	6.66	24.00	3.33	2.72	2.62	22.33
T_2	66.66	8.66	22.33	3.66	3.48	2.90	19.56
T_3	68.00	12.66	21.33	7.66	2.51	1.98	22.63
T_5	59.33	8.66	19.00	7.33	4.03	4.10	19.63
T_6	60.66	4.33	21.00	2.33	4.15	4.24	20.03
T_7	70.33	85.33	24.33	28.00	6.64	7.38	15.60
CD(P= 0.05)	1.39	1.32	1.14	1.05	0.90	0.77	1.12

T_1 : NPK @ 60:30:30 +seed treatment with carbendazim 50 % WP @ 2g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and profenofos 50 EC @ 0.1% at 65 DAS; T_2: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/Kg + PSB 5g/kg seed + dicofol 18.5 EC @ 0.45% at 45 DAS and

profenofos 50 EC @ 0.1% at 65 DAS; T_3:50% NPK (30:15:15) + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + *T. viride* 5g/kg seed and soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray@ 0.2% @ 45 DAS + neem oil @0.03%; T_4: 50% NPK (30:15:15) + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_5: FYM @ 5t/ha + seed treatment with *Azotobactor* 5 g/kg + PSB 5g/kg seed + *T. viride* 5g/kg seed+ soil application 2 kg/ha at 21 DAS + *P. fluorescens* spray @ 0.2% @ 45 DAS + neem oil @ 0.03%; T_6: FYM @ 5 t/ha + seed treatment with *Azotobactor* 5g/ kg + PSB 5g/kg seed + spraying of IAA @ 0.01% at 45 DAS; T_7: control.

NP (MP) 2.3: Evaluation of new fungicides against *Phytophthora parasitica* var. *sabdariffae* in mesta

Centere allotted: Amadalavalsa, Barrackpore and Budbud

Amadalavalsa: All the treatments *i.e.* cymoxanil 8% WP, azoxystrobin 23% SC, trifloxystrobin 25% WG, metalaxyl MZ 8% WP and copper oxychloride 50% WP tested as seed dressing and prophylactic foliar spray at 30 DAS and 45 DAS against foot and stem rot in mesta were superior over control in reducing the disease incidence. In general, the disease incidence was very low which was maximum 13.42 % in control at 120 DAS. Treatment (T_1) was found most effective against *P. parasitica* var. *sabdariffae* in reducing disease incidence with 3.66% at 120 DAS at par with T_2 (4.47%), T_4 (4.49%) T_3 (4.57%) and T_5 (4.72%) (table 3.39). However, highest fibre yield (34.36 q/ha) was recorded in seed treatment with metalaxyl MZ 8% WP @ 3g/kg seed treatment followed by 0.3% foliar spray at 30 and 45 DAS.

Tabl 3.39: Efficacy of new fungicides against *Phytophthora* parasitica var. *sabdariffae* in mesta at Amadalavalsa during 2014

Treatments	Disease incidence (%)					Fibre Yield (q/ha)
	30 DAS	60 DAS	75 DAS	90 DAS	120 DAS	
T_1- Cymoxanil 8% WP	0.63 (4.53)	0.83 (5.10)	0.95 (5.42)	1.56 (7.00)	3.66 (10.98)	28.22
T_2- Azoxystrobin 23% SC	0.50 (3.95)	0.59 (4.27)	0.53 (4.05)	0.80 (4.90)	4.47 (11.64)	27.36
T_3- Trifloxystrobin 25% WG	0.56 (4.21)	0.56 (4.21)	0.68 (4.53)	1.25 (5.79)	4.57 (11.96)	26.97
T_4- Metalaxyl MZ 8% WP	0.80 (5.11)	0.88 (5.33)	0.72 (4.63)	0.90 (5.13)	4.49 (11.46)	34.36
T_5- Copper oxychloride 50% WP	0.51 (4.01)	0.51 (4.01)	0.58 (4.37)	2.22 (8.53)	4.72 (12.47)	26.83
T_6- Control	0.69 (4.61)	0.91 (4.83)	2.11 (8.24)	5.61 (13.68)	13.42 (21.46)	18.00
CD (P= 0.05)	1.30	1.90	1.80	2.20	2.40	1.55

Figure in parentheses are arc sine transformed values, T_1: Seed treatment with cymoxanil 8% WP @ 3g/kg and 0.3% foliar spray*; T_2: Seed treatment with azoxystrobin 23% SC @ 1 ml/kg seed treatment and 0.1% foliar spray ; T_3: seed treatment with trifloxystrobin 25% WG @ 0.5 g/kg seed treatment and 0.05% foliar spray; T_4: Seed treatment with metalaxyl MZ 8% WP @ 2g/kg seed treatment and 0.2% foliar spray; T_5: Seed treatment with copper oxychloride 50% WP @3 g/kg seed treatment and 0.3% foliar spray; T_6: Control.

NP (JE) 6.4: Biorational management of yellow mite in jute

Centres Allotted: Barrackpore, Katihar, Nagaon, Coochbehar and Kendrapara

Barrackpore: The effect of treatments on mite population was significant at different days after treatment (DAT) (table 3.40). The post treatment observations at 4 and 7 DAT indicated significantly less number of mite in treatment T_6 (9.63 mites/cm^2 leaf) and 0.67 mites/cm^2 leaf), respectively followed by T_3. During 2nd spray at 50 DAS, the effect of treatment was significant with least mite population of 5.43 and 0.27 mites/cm^2 leaf, respectively at 4 and 7 DAT in treatment T_6 followed by T_3. The highest plant height (384.00 cm) was observed in treatment T_6 followed by T_3 (379.00 cm). The effect of treatments on fibre yield indicated that the application

of spiromesifen 240 SC @ 0.7 ml/lit. at 35 DAS + neem (azadirachtin 10,000 ppm) @ 3 ml/lit. at 50 DAS was the best treatment with highest yield (35.57 q/ha).

Table 3.40: Biorational management of yellow mite in jute and their effect on fiber yield of jute crop at Barrackpore during 2014

Treatment	Mite population(no./sq cm) at 35 DAS			Mite population(no./sq cm) at 50 DAS			Plant height (cm)	Yield (q/ ha)
	Pre-count	4 DAT	7 DAT	Pre-count	4 DAT	7 DAT		
T_1	89.03	53.07	10.33	72.97	15.80	6.50	367.67	23.91
T_2	93.10	44.77	4.47	66.70	10.90	5.00	371.33	25.52
T_3	89.93	28.03	1.73	61.77	6.80	0.63	379.00	33.46
T_4	89.40	41.30	3.10	64.53	23.40	4.10	360.00	23.43
T_5	91.90	25.07	2.00	75.07	12.67	2.13	368.00	30.48
T_6	83.37	9.63	0.67	72.87	5.43	0.27	384.00	35.57
T_7	88.13	85.83	91.50	65.47	74.03	82.37	341.00	21.98
CD (P=0.05)	NS	7.02	4.02	NS	4.56	1.80	8.89	1.37

T_1: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS and 50 DAS, T_2: *Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS and 50 DAS, T_3: Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS, T_4: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS + *Lecanicillium lecanii* (2 x 10^8 cfu/gm) @ 3 gm/lit at 50 DAS, T_5 :*Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS + Spiromesifen 240 SC @ 0.7 ml/lit at 50 DAS, T_6 :Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS, T_7: Control

Katihar: Yellow mite population among the treatments varied significantly at 4 DAT and 7 DAT during first spray at 35 DAS and second spray at 50 DAS (table 3.41). During first spray, the least number of mite population viz., 7.63 was recorded in T_6 treatment at 4 DAT. At 7 DAT, T_3 was noted to be most effective with significantly least mites population (1.40 mites/cm^2 leaf) compared to 71.50 mites/cm^2 leaf in the control. During 2nd spray, the treatment T_6 had maximum effect on suppression of mite infestation which was 7.10 and at par with T_3 (7.46 at 4 DAT). 0.23 mites/cm^2 leaf in T_3 in superior efficacy of these two treatments was also noted at 7 DAT with 1.03 mites/cm^2 in T_6. The effect of treatments was significant on plant height and fibre yield. There was a significant difference in plant height among the treatments and was significantly high (187.66 cm) in treatment T_3. The maximum yield of (28.12q/ha) was also noticed in the same treatment T_3 treatment consisting of spiromesifen 240 SC @ 0.7ml/lit at 35 and 50 DAS.

Nagaon: The effect of treatments on mite population was significant at different DAT (table 3.42). The post treatment observations at 4 and 7 DAT indicated significantly less number of mite in treatment T_3 (3.17 mites/cm^2 leaf) and 2.20 mites/cm^2 leaf), respectively followed by T_6. During 2nd spray at 50 DAS, the effect of treatment was significant with least mite population of 2.57 and 1.07 mites/cm^2 leaf, respectively at 4 and 7 DAT in treatment T_3 followed by T_5. The highest plant height (297.20 cm) was observed in treatment T_3 followed by T_6 (288.33 cm). The effect of treatments on fibre yield indicated that the application of spiromesifen 240 SC@ 0.7 ml/ lit. at 35 DAS + neem (azadirachtin 10,000 ppm) @ 3 ml/lit. at 50 DAS was the best treatment with highest yield (29.60 q/ha).

Table 3.41: Biorational management of yellow mite in jute and their effect on fiber yield of jute crop at Katihar during 2014

Treatment	Mite population(no./sq cm) at 35 DAS			Mite population(no./sq cm) at 50 DAS			Plant height (cm)	Yield (q/ ha)
	Pre-count	4DAT	7 DAT	Pre-count	4DAT	7 DAT		
T_1	37.70	18.10	11.00	36.30	16.13	6.50	167.66	25.52
T_2	38.10	16.40	6.13	33.36	12.56	5.36	171.33	26.57
T_3	39.93	11.70	1.40	25.10	7.46	0.23	187.66	28.12
T_4	39.40	14.63	5.10	31.20	10.06	3.10	175.66	26.76
T_5	38.56	15.06	2.83	28.40	9.33	2.46	178.00	27.14
T_6	36.70	7.63	1.96	32.86	7.10	1.03	180.66	27.56
T_7	38.13	58.16	71.50	82.13	97.36	133.03	154.66	22.31
CD (P=0.05)	NS	1.92	2.20	NS	1.89	2.09	1.86	0.70

T_1: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS and 50 DAS, T_2: *Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS and 50 DAS, T_3: Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS, T_4: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS + *Lecanicillium lecanii* (2 x 10^8 cfu/gm) @ 3 gm/lit at 50 DAS, T_5 :*Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS + Spiromesifen 240 SC @ 0.7 ml/lit at 50 DAS, T_6 :Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS, T_7: Control

Table 3.42: Effect of treatments on yellow mite population, plant height and fiber yield of jute crop at Nagaon during 2014

Treatment	Mite population(no./sq cm) at 35 DAS			Mite population (no./sq cm) at 50 DAS			Plant height (cm)	Fibre Yield (q/ ha)	B:C
	Pre count	4 DAT	7 DAT	Pre count	4 DAT	7 DAT			
T_1	10.96	7.73	7.43	10.60	8.83	9.43	249.33	25.07	1.62
T_2	11.33	9.60	11.13	10.20	8.90	10.20	241.30	24.63	1.62
T_3	14.60	3.17	2.20	7.20	2.57	1.07	297.20	29.60	1.84
T_4	8.83	6.30	4.93	8.60	7.50	7.67	224.57	24.67	1.61
T_5	11.73	8.03	8.87	8.93	3.20	1.86	246.43	27.16	1.73
T_6	13.06	4.97	2.40	10.80	9.40	7.50	288.33	28.50	1.80
T_7	14.27	14.07	16.57	12.2	15.10	15.93	183.33	17.40	-
CD (P=0.05%)	NS	4.07	6.00	NS	3.62	3.80	42.5	2.87	

T_1: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS and 50 DAS, T_2: *Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS and 50 DAS, T_3: Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS, T_4: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS + *Lecanicillium lecanii* (2 x 10^8 cfu/gm) @ 3 gm/lit at 50 DAS, T_5 :*Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS + Spiromesifen 240 SC @ 0.7 ml/lit at 50 DAS, T_6 :Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS, T_7: Control

Coochbehar: The effect of treatments was significant on post treatment mite population recorded at different intervals *i.e.* 4 and 7 DAT at 35 and 50 DAS. The post treatment observation at 35 DAS after 4 and 7 DAT indicated significantly less number of mite i.e. 3.57 and 8.70 mites/ cm^2

leaf in treatment T_4 and T_1 respectively (table 3.43). Similarly, after second spray (50 DAS), significantly least population of 6.63 and 5.73 mites/ cm^2 leaf was recorded at 4 and 7 DAT in the treatments of T1 and T3 respectively. Among the treatments, maximum plant height of 215.90 cm was on T_3 treatment being at par with T_6 (214 cm), T_5 (212 cm) and T_2 (205.68 cm). There was significant difference among the treatments on jute fibre yield. Significantly maximum fibre yield (35.43 q/ha) was recorded in T6 being at par with T5 (34.28 q/ha) and T3 (33.27 q/ha). On the basis of overall reduction in mite population, plant height and yield, application of spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS followed by neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS was most effective.

Table 3.43: Effect of treatments on yellow mite population, plant height and fiber yield of jute crop at Coochbehar during 2014

Treatment	Mite population(no./sq cm) at 35 DAS			Mite population(no./sq cm) at 50 DAS			Plant height (cm)	Yield (q/ha)
	Pre-count	4DAT	7 DAT	Pre-count	4DAT	7 DAT		
T_1	15.83	5.00	8.70	26.07	6.63	10.77	202.80	30.99
T_2	18.17	6.63	9.23	31.07	8.70	15.97	205.68	30.33
T_3	15.17	9.73	14.43	29.03	15.63	5.73	215.90	33.27
T_4	15.73	3.57	9.13	30.17	9.23	8.40	204.25	30.37
T_5	14.73	8.03	11.40	28.37	16.33	5.80	212.00	34.28
T_6	17.30	7.93	13.10	27.00	12.37	6.03	214.00	35.43
T_7	16.00	15.20	22.77	25.20	26.90	31.37	194.38	29.04
CD (P=0.05)	NS	0.58	4.85	NS	0.91	0.62	9.28	3.96

T_1: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS and 50 DAS, T_2: *Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS and 50 DAS, T_3: Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS, T_4: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS + *Lecanicillium lecanii* (2 x 10^8 cfu/gm) @ 3 gm/lit at 50 DAS, T_5 :*Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS + Spiromesifen 240 SC @ 0.7 ml/lit at 50 DAS, T_6 :Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS, T_7: Control

Kendrapara: During first treatment observation at 35 DAS, the effect of treatments was significant on mite population (table 3.44). The post treatment observation at 4 and 7 DAT indicated that all the treatments recorded significantly less mite (0.87-4.06 mites/ cm^2) than control (14.23) with lowest in T_3 treatment at 7 DAT. Similarly during second spray at 50 DAS, there was significant reduction in mite population (0.40 mites/ cm^2) in treatment T_3 over control (9.81 mites/ cm^2) at 7 DAT. There was significant effect of treatments on plant height and it ranged from 158.36 to 179.56 cm compared to 146.48 cm in control. Significantly maximum fibre yield was (28.50 q/ha) was recorded in T_3 (28.50 q/ha) i.e. application of spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS.

Table 3.44: Effect of treatments on yellow mite population, plant height and fiber yield of jute crop at Kendrapara during 2014

Treatment	Mite population(no./sq cm) at 35 DAS			Mite population(no./sq cm) at 50 DAS			Plant height (cm)	Yield (q/ha)
	Pre-count	4DAT	7 DAT	Pre-count	4DAT	7 DAT		
T_1	10.43	5.76	2.32	12.54	4.74	3.05	163.77	25.05
T_2	11.31	7.06	4.06	13.72	7.01	6.70	158.36	23.33
T_3	11.11	3.24	0.87	9.83	1.68	0.40	179.56	28.50
T_4	9.35	6.06	2.44	12.93	5.14	4.08	161.39	24.11
T_5	10.30	5.36	1.71	11.59	1.88	0.56	178.15	27.74
T_6	10.63	5.01	1.20	10.86	3.76	2.04	176.90	26.00
T_7	10.84	13.12	14.23	17.62	11.60	9.81	146.48	19.72
CD (P=0.05)	NS	1.25	0.84	NS	1.11	1.00	5.00	2.31

T_1: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS and 50 DAS, T_2: *Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS and 50 DAS, T_3: Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS and 50 DAS, T_4: Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 35 DAS + *Lecanicillium lecanii* (2 x 10^8 cfu/gm) @ 3 gm/lit at 50 DAS, T_5 :*Lecanicillium lecanii* (2 x 10^8cfu/gm) @ 3 gm/lit at 35 DAS + Spiromesifen 240 SC @ 0.7 ml/lit at 50 DAS, T_6 :Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + Neem (Azadirachtin 10,000ppm) @ 3 ml/lit at 50 DAS, T_7: Control

NP (JE-6.5) Bio-efficacy of mineral oil against yellow mite, *Polyphagotarsonemus latus* in jute crop

Centres allotted: Barrackpore and Kendrapara

Barrackpore: The effect of treatments on yellow mite population was significant at different days after treatment (DAT) (table 3.45). The post treatment observation at 4 and 7 days after first application indicated significantly less number of mites in treatment T_5 with 20.63 and 10.00 mites/cm^2 of leaf respectively. During 2nd spray at 50 DAS, the effect of treatment was significant with least mite population of 2.56 and 0.13 mites/ cm^2 leaf respectively at 4 and 7 DAT in treatment T_5. The effect of treatment on fibre yield indicated that the application of mineral oil @ 3 ml/ lit. + neem oil @ 3ml/lit at 35 and 50 DAS was the best treatment with highest yield (24.93 q/ ha).

Kendrapara: The treatment T_3 (mineral oil @ 9 ml/litre) was statistically significant over all other treatments in reducing the mite population 3.6 mite/cm^2 and 0.6 mite/cm^2 at 4 DAT and 7 DAT after first spraying over control 15.7 mite/cm^2 (table 3.46). During second spraying all the treatments were significantly different over control but maximum mite population was reduced in T_3 (1.9 mite/cm^2) over control (12.11 mite/cm^2) at 4 DAT and similar trend was observed at 7 DAT. The highest fibre yield was observed in T_3 (28.41q/ha) being at par with T_2 (28.05q/ha), T_5 (27.01q/ha), T_4 (24.83q/ha) and T_1 (25.75q/ha).

Table 3.45: Bio-efficacy of different treatments against yellow mite population and fibre yield in jute crop at Barrackpore during 2014

Treatment	Yellow mite (no. /cm² leaf area)						Fibre yield (q/ha)
	35 DAS (Pre count)	4 DAT	7 DAT	50 DAS (Pre count)	4 DAT	7DAT	
T_1	61.06	44.96	37.70	17.20	7.96	2.03	21.77
T_2	85.40	50.33	26.43	29.06	9.06	1.33	21.04
T_3	79.13	45.96	30.63	20.66	11.36	1.30	23.55
T_4	51.33	31.36	33.10	25.33	12.10	1.60	23.47
T_5	42.43	20.63	10.00	18.90	2.56	0.13	24.93
T_6	59.83	30.53	21.26	26.90	5.90	1.36	21.88
T_7	54.66	77.66	151.00	37.73	39.56	30.66	19.51
SEm±	9.01	7.54	5.55	3.24	1.52	1.59	0.58
CD(P=0.05)	4.36	3.98	3.42	2.59	1.78	1.83	1.09

T_1- mineral oil @ 3 ml/litre at 35 and 50 DAS, T_2- mineral oil @ 6 ml/litre at 35 and 50 DAS, T_3- mineral oil @ 9 ml/litre at 35 and 50 DAS,T_4-neem oil @ 3 ml/litre at 35 and 50 DAS, T_5- mineral oil @ 3 ml/litre + neem oil @ 3 ml/litre at 35 and 50 DAS, T_6-Insectcidal soap solution @ 3 ml/litre at 35 and 50 DAS, T_7-control (No spray).

Table 3.46: Bio-efficacy of different treatments against yellow mite population and fibre yield in jute crop at Kendrapara during 2014

Treatments	Yellow mite (no. /cm² leaf area)						Fibre yield (q/ha)
	35 DAS (Pre count)	4 DAT	7 DAT	50 DAS (Pre count)	4 DAT	7 DAT	
T_1	11.20	7.30	5.00	8.80	5.10	4.00	25.75
T_2	10.80	5.00	1.40	7.20	2.50	0.80	28.05
T_3	13.10	3.60	0.60	6.70	1.90	0.00	28.41
T_4	11.60	6.90	4.80	8.90	5.20	3.80	24.83
T_5	11.10	5.40	1.90	7.70	3.20	1.40	27.01
T_6	10.50	4.70	6.20	10.80	5.40	5.90	22.55
T_7	12.50	14.00	15.70	18.20	10.10	9.60	20.27
SEm±	0.94	0.52	0.39	0.62	0.33	0.25	1.47
CD (P=0.05)	2.90	1.58	1.21	1.90	1.03	0.76	4.51

T_1- mineral oil @ 3 ml/litre at 35 and 50 DAS, T_2- mineral oil @ 6 ml/litre at 35 and 50 DAS, T_3- mineral oil @ 9 ml/litre at 35 and 50 DAS,T_4-neem oil @ 3 ml/litre at 35 and 50 DAS, T_5- mineral oil @ 3 ml/litre + neem oil @ 3 ml/litre at 35 and 50 DAS, T_6-Insectcidal soap solution @ 3 ml/litre at 35 and 50 DAS, T_7-control (No spray).

NP (JP) 2.4: Evaluation of some new fungicide molecules for management of *Macrophomina phaseolina* induced disease complex in jute

Centres allotted: Kendrapara, Barrackpore, Coochbehar, Nagaon and Katihar

Kendrapara: Among all treatments, T_7 was found most effective for control of both diseases viz.

stem rot (2.08% and 4.08% at 60 and 90 DAS, respectively) and root rot (7.22%) at 90 DAS and also exhibited higher fibre yield (25.64 q/ha) (table 3.47). Seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS consistently controlled the stem and root rot till 90 DAS with maximum fibre yield compared to 42.58 stem rot codex and 21.63% root rot incidence and 11.83 q/ha yield in control T_8.

Table 3.47: Effect of the new fungicide molecules on disease incidence in jute at Kendrapara during 2014

Treatments	Stem rot (Codex)		Root rot (%)	Yield (q/ha)
	60 DAS	90 DAS	90 DAS	
T_1	22.08	134.64	7.92	20.42
T_2	24.99	148.50	4.44	19.11
T_3	15.33	42.50	9.18	19.35
T_4	3.66	32.00	2.96	24.60
T_5	51.17	74.67	10.12	18.98
T_6	4.67	30.67	2.96	24.76
T_7	2.08	4.08	2.22	25.64
T_8	23.92	42.58	21.63	11.83
CD (P= 0.05)	3.80	4.36	3.51	4.05

T_1: Seed treatment with carbendazim 50% WP @ 2g/kg seed + spraying of carbendazim @ 0.2 % at 45 DAS of crop age. T_2: Seed treatment with propineb 70% WP @ 2g/kg seed + spraying of propineb @ 0.2 % at 45 DAS of crop age. T_3: Seed treatment with tebuconazole 25% EC @ 1.5ml/kg seed + spraying of tebuconazole @ 0.15 % at 45 DAS of crop age. T_4: Seed treatment with difenoconazole 25% EC @ 1.5ml/kg seed + spraying of difenoconazole @ 0.15% at 45 DAS of crop age T_5: Seed treatment with cyproconazole @ 1.0ml/kg seed + spraying of cyproconazole @ 0.08% at 45 DAS of crop age. T_6: Seed treatment with tricyclazole + propiconazole @ 1.0ml/kg seed + spraying of tricyclazole + propiconazole @ 0.1% at 45 DAS of crop age. T_7: Seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age. T_8: control

Coochbehar: Lowest stem rot incidence 0.06% and 1.41% were recorded at 60 and 90 DAS respectively, in treatment T_7 (Seed treatment with azoxystrobin + difenoconazole @ 1.0 ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age). The stem rot codex at 90 DAS (3.71) and root rot (0.68%) was also significantly low in T_7 with maximum fibre yield (20.85 q/ha) (table 3.48). The disease incidence was significantly high in control with only 14.53 q/ha fibre yield.

Barrackpore: Among all the treatments lowest incidence of stem rot (0.07% and 1.13%) and stem rot codex (0.02 and 1.73) were recorded at 60 and 90 DAS respectively, with treatment T_7 followed by T_3. All the treatments had showed significant effect in reducing the incidence of stem rot and non-significant for fibre yield. Higher fibre yield (29.28 q/ha) was recorded in treatment (T_7).

Nagaon: Among the treatments lowest incidence of stem rot (0.53 and 0.43% at 60 and 90 DAS, respectively), root rot (0.72% at 90 DAS) and seedling blight (0.06% at 25 DAS) as well as maximum fibre yield (29.13 q/ha) was recorded in treatment T_7. The disease incidence and yield (28.60 q/ha) in treatment T_6 was at par with T_7 compared to significantly less yield (18.20 q/ha) in the untreated control.

Table 3.48: Effect of the new fungicide molecule treatments on disease incidence in jute at Coochbehar during 2014

Treatments	Stem rot (%)		Stem rot (Codex)		Root rot (%)	Yield (q/ha)
	60 DAS	90 DAS	60 DAS	90 DAS	90 DAS	
T_1	0.13	2.26	0.14	9.10	1.35	18.40
T_2	0.10	2.05	0.08	6.65	0.83	18.75
T_3	0.08	1.96	0.05	5.20	0.71	19.23
T_4	0.13	2.42	0.13	7.78	1.11	17.73
T_5	0.14	2.48	0.15	8.37	1.48	17.55
T_6	0.12	2.09	0.10	8.20	0.94	17.88
T_7	0.06	1.41	0.03	3.71	0.68	20.85
T_8	0.31	4.39	0.46	25.52	1.92	14.53
CD(P= 0.05)	0.11	0.47	0.16	1.32	0.34	0.56

T_1: Seed treatment with carbendazim 50% WP @ 2g/kg seed + spraying of carbendazim @ 0.2 % at 45 DAS of crop age. T_2: Seed treatment with propineb 70% WP @ 2g/kg seed + spraying of propineb @ 0.2 % at 45 DAS of crop age. T_3: Seed treatment with tebuconazole 25% WB @ 1.5ml/kg seed + spraying of tebuconazole @ 0.15 % at 45 DAS of crop age. T_4: Seed treatment with difenoconazole 25% EC @ 1.5ml/kg seed + spraying of difenoconazole @ 0.15% at 45 DAS of crop age T_5: Seed treatment with cyproconazole @ 1.0ml/kg seed + spraying of cyproconazole @ 0.08% at 45 DAS of crop age. T_6: Seed treatment with tricyclazole + propiconazole @ 1.0ml/kg seed + spraying of tricyclazole + propiconazole @ 0.1% at 45 DAS of crop age. T_7: Seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age. T_8: control

Table 3.49: Effect of the new fungicide molecules on disease incidence in jute at Barrcakpore during 2014

Treatments	Stem rot (%)		Stem rot (Codex)		Yield (q/ha)
	60 DAS	90 DAS	60 DAS	90 DAS	
T_1	0.13	1.67	0.12	3.89	27.50
T_2	0.15	1.67	0.14	4.00	26.66
T_3	0.09	1.72	0.07	2.78	28.88
T_4	0.13	2.13	0.17	5.03	26.55
T_5	0.11	2.10	0.10	4.82	25.86
T_6	0.11	1.87	0.06	4.88	25.47
T_7	0.07	1.13	0.02	1.73	29.28
T_8	0.21	2.97	0.32	7.77	20.00
CD (P= 0.05)	0.10	0.47	0.12	0.75	NS

T_1: Seed treatment with carbendazim 50% WP @ 2g/kg seed + spraying of carbendazim @ 0.2 % at 45 DAS of crop age. T_2: Seed treatment with propineb 70% WP @ 2g/kg seed + spraying of propineb @ 0.2 % at 45 DAS of crop age. T_3: Seed treatment with tebuconazole 25% WB @ 1.5ml/kg seed + spraying of tebuconazole @ 0.15 % at 45 DAS of crop age. T_4: Seed treatment with difenoconazole 25% EC @ 1.5ml/kg seed + spraying of difenoconazole @ 0.15% at 45 DAS of crop age T_5: Seed treatment with cyproconazole @ 1.0ml/kg seed + spraying of cyproconazole @ 0.08% at 45 DAS of crop age. T_6: Seed treatment with tricyclazole + propiconazole @ 1.0ml/kg seed + spraying of tricyclazole + propiconazole @ 0.1% at 45 DAS of crop age. T_7: Seed treatment with azoxystrobin 23% SC + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age. T_8: control

Table 3.50: Effect of the new fungicide molecules on disease incidence in jute at Nagaon during 2014

Treatments	Incidence (%) of disease				Yield (q/ha)
	Stem rot		Root rot	Seedling blight	
	60 DAS	90 DAS	90 DAS	25 DAS	
T_1	1.30	1.00	1.05	0.15	25.26
T_2	1.28	1.01	1.20	0.14	25.96
T_3	1.42	1.13	1.37	0.16	22.76
T_4	1.20	0.98	1.65	0.12	26.00
T_5	1.37	1.12	1.81	0.16	24.40
T_6	0.74	0.52	1.04	0.10	28.60
T_7	0.53	0.43	0.72	0.06	29.13
T_8	5.86	7.12	2.96	0.54	18.26
CD (P= 0.05)	0.43	0.37	0.52	0.23	0.78

T_1: Seed treatment with carbendazim 50% WP @ 2g/kg seed + spraying of carbendazim @ 0.2 % at 45 DAS of crop age. T_2: Seed treatment with propineb 70% WP @ 2g/kg seed + spraying of propineb @ 0.2 % at 45 DAS of crop age. T_3: Seed treatment with tebuconazole 25% WB @ 1.5ml/kg seed + spraying of tebuconazole @ 0.15 % at 45 DAS of crop age. T_4: Seed treatment with difenoconazole 25% EC @ 1.5ml/kg seed + spraying of difenoconazole @ 0.15% at 45 DAS of crop age T_5: Seed treatment with cyproconazole @ 1.0ml/kg seed + spraying of cyproconazole @ 0.08% at 45 DAS of crop age. T_6: Seed treatment with tricyclazole + propiconazole @ 1.0ml/kg seed + spraying of tricyclazole + propiconazole @ 0.1% at 45 DAS of crop age. T_7: Seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age. T_8: control

Katihar: Among all the treatments T_3 (seed treatment and foliar spraying with tebuconazole 25% EC) was found effective for reducing stem rot (0.19% and 0.96% at 60 and 90 DAS, respectively) and root rot (1.07 at 90 DAS) as compared to check. However, there was no seedling blight at 25 DAS in all treatments except treatment (T_2)

Table 3.51: Effect of the new fungicide molecules on disease incidence in jute at Katihar during 2014

Treatments	Incidence (%) of disease			
	Stem rot		Root rot	Seedling blight
	60 DAS	90 DAS	90 DAS	25 DAS
T_1	0.48	1.67	1.80	0.00
T_2	0.90	2.68	3.16	0.56
T_3	0.19	0.96	1.07	0.00
T_4	0.62	2.70	2.97	0.00
T_5	0.48	2.77	3.40	0.00
T_6	0.69	2.58	3.28	0.00
T_7	0.27	1.0	1.44	0.00
T_8	1.89	6.26	5.94	3.53
CD (P= 0.05)	0.26	0.43	0.50	0.50

T_1: Seed treatment with carbendazim 50% WP @ 2g/kg seed + spraying of carbendazim @ 0.2 % at 45 DAS of crop age. T_2: Seed treatment with

propineb 70% WP @ 2g/kg seed + spraying of propineb @ 0.2 % at 45 DAS of crop age. T_3: Seed treatment with tebuconazole 25% WB @ 1.5ml/kg seed + spraying of tebuconazole @ 0.15 % at 45 DAS of crop age. T_4: Seed treatment with difenoconazole 25% EC @ 1.5ml/kg seed + spraying of difenoconazole @ 0.15% at 45 DAS of crop age T_5: Seed treatment with cyproconazole @ 1.0ml/kg seed + spraying of cyproconazole @ 0.08% at 45 DAS of crop age. T_6: Seed treatment with tricyclazole + propiconazole @ 1.0ml/kg seed + spraying of tricyclazole + propiconazole @ 0.1% at 45 DAS of crop age. T_7: Seed treatment with azoxystrobin + difenoconazole @ 1.0ml/kg seed + spraying of azoxystrobin + difenoconazole @ 0.075% at 45 DAS of crop age. T_8: control

NP (JB) 5.15 Recording of insect pests and diseases in Advanced Varietal Trials - I in *C. olitorius* at Barrackpore during 2014

Barrackpore: Among the AVT-I entries of *C. olitorius*, maximum infestation of semilooper and apion was observed at 90 DAS (table 3.52). There was no significant difference in the level of insect pests and disease incidence among the entries. The entries, BCCO-8 and JROK-14 harboured maximum infestation of apion and semilooper with 5.27% and 40.93% respectively at 90 DAS. The infestation of BHC was recorded only at 90 DAS with maximum infestation of 6.40% on check variety, JRO 524+ as compared to least of 1.73% on NJ-7010. Similarly the incidence of stem rot was negligible at 90 DAS with maximum of 3.12 % and 5.22% in check varieties, JRO 524 + and JRO 8432+ respectively. With respect to insect pest and disease susceptibility, the test entries were similar to the check varieties.

Table 3.52: Relative infestation / incidence (%) of insect pest and diseases in the entries of tossa jute (AVT-I) at Barrackpore during 2014

Entries	60 DAS		75 DAS		90 DAS			
	Apion (%)	Semilooper (%)	Apion (%)	Semilooper (%)	Apion (%)	Semilooper (%)	BHC (%)	Stem rot (%)
BCCO-8	5.86	24.95	4.62	22.78	5.27	32.28	4.89	0.71
NJ-7005	4.38	17.73	4.83	16.73	3.08	38.30	1.99	1.93
NJ-7010	4.84	13.05	4.37	23.10	3.67	31.96	1.73	1.14
JROK-15	5.21	14.94	5.01	21.60	3.47	32.06	4.68	0.77
JROK-14	3.99	18.41	5.58	24.07	4.68	40.93	4.92	1.26
JRO 524 +	3.78	15.64	4.65	24.48	4.58	35.60	6.40	1.80
JRO 8432 +	4.63	32.64	5.81	27.57	4.35	31.01	2.36	3.12
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS

+ Check variety

NP (JB) 5.16 Recording of insect pests and diseases in Advanced Varietal Trials - II in *C. olitorius* at Barrackpore during 2014

Barrackpore: None of the entries showed immune reaction to insect pests and diseases. There was no significant difference in the relative susceptibility among of the tested entries and the check varieties (table 3.53).

NP (JB) 5.18 Recording of insect pests and diseases in Advanced Varietal Trials - I in *C. capsularis* at Barrackpore during 2014

Barrackpore: No significant difference was observed among the test entries and the check varieties with respect to relative pests and disease incidence. The apion infestation was more in late stage of the crop i.e. 90 DAS and it ranged from 7.70% to 13.76% on NCJ-28-1 and JRC-517 at 90 DAS as compared to least infestation of 2.39% on NDJC-2013 at 60 DAS (table 3.54). The BHC infestation was noticed only at 90 DAS and it ranged from 1.08% (NCJ-28-1-1) to 3.35% (JRCJ -5). The incidence of YVMV and stem rot was noticed at all the three stages of the crop. The disease incidence of YVMV has progressed as the crop stage advanced. The highest of 16.57% was observed on entry, NDJC-2013 as compared to 4.66% on check variety (JRC-698+).

The incidence of stem rot was maximum *i.e* 6.01% at 90 DAS on check variety, JRC 517+. The reaction towards pest and disease in the test entries was similar to the check varieties.

Table 3.53: Relative infestation/incidence (%) of insect pests and diseases in Advanced Varietal Trials - II in *C. olitorius* at Barrackpore during 2014

Entries	60 DAS		75 DAS		90 DAS		
	Semilooper (%)	Apion (%)	Semilooper (%)	Apion (%)	Semilooper (%)	BHC (%)	Stem rot (%)
JROK-10	4.92	5.75	21.50	4.47	30.45	5.57	1.02
KRO-4	4.37	4.69	23.84	5.53	34.49	6.74	1.83
KRO-5	3.91	6.19	19.80	7.50	44.48	2.10	0.88
JRO-2011-2	4.63	4.37	25.50	6.41	29.99	9.70	1.73
BCCO-6	5.82	5.94	25.69	6.59	35.58	8.78	1.55
JRO 524 +	5.51	5.33	26.20	5.43	32.14	3.72	1.04
JRO 8432 +	4.89	6.56	29.48	5.94	29.17	3.07	2.21
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS

+ Check variety

NP (JB) 5.19 Recording of insect pest and diseases in Advanced Varietal Trials -II in *C. capsularis* at Barrackpore during 2014

Barrackpore: The test entries and the check varieties did not have significant effect on relative insect pest and disease incidence. The test entries were similar in their response to pest and disease susceptibility with the check varieties (table 3.55).

NP (SB) 12.58. Recording of foot and stem rot disease in Advanced Varietal Trials - I in *H. sabdariffa* at Barrackpore during 2014

Foot and stem rot incidence on different entries of mesta were recorded (table 3.56). The level of disease incidence in the tested entries did not differ significantly from the check entries. All tested entries were found highly susceptible. Numerically least infected line was AHS 238 (8.42% incidence at 90 DAS) compared to 4.36% in the check variety HS 4288.

Stem rot

Yellow vein mosaic

Table 3.54: Relative infestation / incidence (%) of insect pest and diseases in Advanced Varietal Trails - I in *C. capsularis* at Barrackpore during 2014

Entries	60 DAS				75 DAS				90 DAS				
	Apion (%)	Semilooper (%)	Stem rot (%)	YVMV (%)	Apion (%)	Semilooper (%)	Stem rot (%)	YVMV (%)	Apion (%)	Semilooper (%)	BHC (%)	Stem rot (%)	YVMV (%)
NCJ- 28-1-1	8.17	3.92	4.27	7.33	5.90	16.20	2.86	11.51	7.70	26.58	1.08	1.72	11.19
BCCC-3	7.82	6.27	2.88	1.70	7.91	11.90	4.15	12.69	7.93	31.15	1.98	2.10	14.96
JRCJ-5	7.15	3.40	2.56	4.80	5.10	16.01	3.95	8.88	10.16	44.42	3.35	5.69	16.38
NDJC-2013	6.30	2.39	1.60	3.38	6.92	8.43	3.88	12.04	7.92	38.03	3.06	2.55	16.57
JRC 517 +	7.46	2.73	2.81	2.07	5.21	16.20	4.71	10.47	13.76	41.08	1.89	6.01	16.46
JRC 698+	7.26	3.52	2.16	1.80	8.98	12.95	3.23	11.96	11.92	34.21	2.29	4.57	4.66
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

+ Check variety

Table 3.55: Relative infestation / incidence (%) of insect pest and diseases in Advanced Varietal Trials - II in *C. capsularis* at Barrackpore during 2014

Entries	60 DAS				75 DAS				90 DAS				
	Apion (%)	Semilooper (%)	Stem rot (%)	YVMV (%)	Apion (%)	Semilooper (%)	Stem rot (%)	YVMV (%)	Apion (%)	Semilooper (%)	BHC (%)	Stem rot (%)	YVMV (%)
JRCJ-4	5.30	5.14	2.74	4.23	7.62	17.57	4.83	7.54	6.79	31.70	2.34	3.18	8.95
JRCJ-3	5.80	7.50	2.03	5.91	6.62	13.55	4.89	8.82	3.42	41.78	0.99	3.15	15.41
NCJ-28-14	5.30	8.20	1.95	3.57	8.01	14.81	5.13	8.01	5.20	36.74	3.36	3.04	22.55
BCCC-2	4.79	6.79	2.47	4.41	6.15	15.35	4.84	9.13	5.79	41.66	1.47	2.34	17.54
JRC 698+	5.65	6.89	2.39	1.29	7.48	20.41	3.84	8.17	4.89	50.32	1.01	4.95	5.46
JRC 321+	3.72	6.17	2.05	1.82	10.59	24.14	4.74	11.88	7.30	48.33	5.16	1.88	14.44
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

+ Check variety

Table 3.56: Relative incidence of foot and stem rot disease in Advanced Varietal Trials - I in *H. sabdariffa* at Barrackpore during 2014

Treatments	Disease incidence (%)		
	60 DAS	75 DAS	90 DAS
AHS-238	7.87	6.64	8.42
AHS-249	4.70	8.66	12.01
AHS-254	10.91	8.57	10.30
JRR2012-1	8.06	4.86	10.40
AMV 5+	9.33	7.54	8.65
HS 4288 +	2.22	4.00	4.36
CD (P=0.05)	NS	NS	NS

+check variety

NP (SB) 12.59 Recording of foot and stem rot disease in Advanced Varietal Trials - II in *H. sabdariffa* at Barrackpore during 2014

Foot and stem rot incidence on different entries of mesta were recorded and presented in table 3.57. Among all entries AHS 230 was found highly resistant and showed lower disease incidence across all the observations viz; 60, 75 and 90 DAS in compared to both check varieties (AMV 5 and HS 4288).

Table 3.57: Relative incidence of foot and stem rot disease in Advanced Varietal Trials - II in *H. sabdariffa* at Barrackpore during 2014

Treatments	Disease incidence (%)		
	60 DAS	75 DAS	90 DAS
AHS-233	2.73	1.79	1.25
JRR-2011-1	3.60	1.29	3.58
AHS-230	1.22	0.75	1.59
AMV 5 +	5.41	4.75	1.97
HS 4288 +	3.16	1.13	1.94
CD (P=0.05)	NS	NS	NS

+check variety

NP (JB) 12.61: Recording of insect pests and disease in Advanced Varietal Trial-I of roselle during 2014

Amadalavalasa: The data reveals that the pest incidence was low. Among the six entries tested in AVT-I, the intensity of aphid population varied from 10.94-18.50/ 10 plants in check

varieties, *i.e* AMV 5+ and HS 4288+ respectively (table 3.58). The entry, AHS 254 recorded more infestation of whiteflies compared to other entries under test. In none of the entries the infestation of leaf hopper is > 2.00/ 10 plants. The infestation of semilooper is very negligible and entry, AHS-238 was found to be immune. Infestation of mealybug was low in all the entries and it ranged from 1.89 to 5.02% in JRR-2012-1 and AHS-249 respectively. The incidence of foot and stem rot disease was highest (20.56%) in AHS-254 as compared to 17.96% in check variety, AMV 5+. The entries, AHS-249, JRR-2012-1 and AHS-238 recorded least incidence of 6.36%, 7.29% and 11.81% respectively.

Table 3.58: Relative infestation/incidence of insect pests and diseases in the entries of roselle (AVT-I) at Amadalavalasa during, 2014

Entries	Population/ 10 plants			Infestation (%)		Foot & stem rot (%)
	Aphids	Whiteflies	Leaf hopper	Semilooper	Mealybug	
AHS-238	14.75*	2.13	1.31	0.00	3.88	11.81
AHS-249	16.44	3.25	1.81	0.06	5.02	6.36
AHS-254	12.19	3.44	1.50	0.01	3.93	20.56
JRR-2012-1	20.13	2.75	1.13	0.03	1.89	7.29
AMV 5+	10.94	1.94	1.19	0.04	2.65	17.96
HS 4288 +	18.50	2.56	1.88	0.01	3.95	8.32

+ Check variety *Cumulative mean data of insect pests and disease recorded at 30, 60, 90 and 120 DAS.

NP (SB) 12.62 Recording of insect pests in and disease in Advanced Varietal Trial-II of roselle

The data was recorded on insect pests infestation and disease incidence in AVT-II under unprotected conditions. Among the five entries the infestation of aphid was more as compared to whiteflies and leafhoppers. The entries, AHS-233 and JRR-2011-1 recorded more aphid infestation i.e. 24.31 and 24.88/10 plants respectively as compared to 20.25 and 23.00/ 10 plants in check varieties i.e AMV-5+ and HS-4288+ respectively (table 3.59). The infestation of whitefly was negligible with maximum of 2.69 whiteflies/ 10 plants. The maximum infestation of 2.25 leafhoppers/10 plants was recorded on JRR-2011-1. All the entries showed < 1.00% of semilooper infestation. The mealybug infestation was highest in check varieties with 3.45% and 4.28% infestation on AMV 5+ and HS 4288 respectively. The entry, AHS-233 was found to be immune to mealybug infestation. The incidence of foot and stem rot was maximum on AHS-233 with 6.63% plant damage as compared to 5.87% in check variety, AMV 5+. The entry, AHS-230 was found to be moderately resistant with 1.73% of disease incidence.

NP (SNH-B) 1.16: Recording of disease in Advanced Varietal Trails - I in *C. juncea* at Barrackpore during 2014

Incidence of Fusarium vascular wilt on different entries of sunnhemp under this trial are presented in table 3.60. In terms of relative susceptibility to wilt there was no significant difference in the disease infection among the tested entries and the check varieties. Numerically Sanai-9 suffered least disease incidence (18.30%) compared to 35.77% and 25.60% in the check varieties.

NP (SNH-B) 1.17: Recording of disease in Advanced Varietal Trials - II in *C. juncea* at Barrackpore during 2014

Incidence of Fusarium vascular wilt in different entries of sunnhemp under this trial are presented in table 3.61. There was no significant difference in wilt incidence among the tested and check entries. The wilt incidence at 45 DAS in test entries varied from 28.22% in SUIN-2 to 39.40% in SUIN-4 compared to 28.96% and 38.76% in the check varieties.

Table 3.59: Relative infestation/incidence of insect pests and diseases in the entries of roselle (AVT-II) at Amadalavalasa during 2014

Entries	Population/ 10 plants			Infestation (%)		Foot & stem rot (%)
	Aphids	Whiteflies	Leaf hopper	Semilooper	Mealybug	
AHS-233	24.31*	1.94	1.63	0.02	0.00	6.63
JRR-2011-1	24.88	2.63	2.25	0.05	0.65	4.60
AHS-230	24.44	2.25	1.75	0.06	1.97	1.73
AMV 5 +	20.25	2.50	1.88	0.03	3.45	5.87
HS 4288 +	23.00	2.69	1.75	0.09	4.28	2.94

+ Check variety *Cumulative mean data of insect pests and disease recorded at 30, 60, 90 and 120 DAS.

Wilt of sunnhemp

Table 3.60: Relative incidence of disease in Advanced Varietal Trails - I in *C. juncea* at Barrackpore during 2014

Treatments	Wilt Incidence (%)	
	30 DAS	45 DAS
Sanai-6	20.81	24.42
Sanai-10	22.45	24.43
Sanai-9	13.70	18.30
Sanai-7	22.08	28.29
SH 4 +	26.50	35.77
SUIN 053 +	17.14	25.60
CD (P=0.05)	NS	NS

+check variety

Table 3.61 : Relative incidence of disease in Advanced Varietal Trials - II in *C. juncea* at Barrackpore during 2014

Treatments	Wilt Incidence (%)	
	30 DAS	45 DAS
SUIN-5	26.09	30.97
SUIN-2	22.77	28.22
SUIN-4	31.66	39.40
SUIN-1	25.12	32.22
SUIN-3	27.28	33.24
K 12 Yellow +	20.77	28.96
SH 4+	31.15	38.76
CD (P=0.05)	NS	NS

+check variety

Fibre Quality

Fibre Quality 2013-14

Fibre quality was evaluated for samples of different entries of AINP on Jute and Allied Fibres. The results are presented in following sections:

NP(JB) 5.09: IET with *olitorius* jute

Performance of different entries at Katihar centre in terms of fibre quality under this trial are presented in table 4.1.

Table 4.1: Fibre quality of entries under IET of *olitorius* jute

Centre / Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar							
JROK-14	15	2.0	16.9	2.1	F. Average	M. Bodied	TD-6+80%↑
NJ-7010	35	>2.0	19.2	2.6	F. Average	M. Bodied	TD-6+85%↑
BCCO-9	15	1.5	22.4	2.3	Average	M. Bodied	TD-4
BCCO-8	35	2.0	19.7	2.3	F. Average	M. Bodied	TD-5
JROCS-1	35	2.0	20.2	2.0	F. Average	M. Bodied	TD-5
JRO 524+	20	2.0	23.5	2.4	F. Average	M. Bodied	TD-5 +30%↑
JROK-16	20	1.5	18.2	2.1	F. Average	M. Bodied	TD-5 +80%↑
JROK-15	15	2.0	22.1	2.2	Average	M. Bodied	TD-5 +60%↑
JROK-13	35	2.0	16.5	2.0	F. Average	M. Bodied	TD-6 +30%↑
JRO 204+	20	2.0	23.5	2.2	F. Average	M. Bodied	TD-5+30%↑
JROCS-2	15	2.0	20.5	2.8	F. Average	M. Bodied	TD-5 +30%↑
NJ-7005	25	1.5	22.4	2.4	F. Average	M. Bodied	TD-5 +90%↑

+ Check variety

Katihar: Root content varied from 15 to 35 percent. All the samples were full of defects. Tenacity values of all the samples varied from weak to fair average. Fineness value for all the entries was very fine in nature except JROCS-2. Grade varied from TD-4 to TD-6.

NP(JB) 5.10: AVT-I with *olitorius* jute

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.2.

Table 4.2: Quality characters of fibre of entries under AVT-I with *olitorius* jute

Centre / Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar							
BCCO-6	8	1.0	26.0	2.9	F. Good	H. Bodied	TD-3+20%↑
KRO-4	20	1.5	23.2	2.0	F. Average	H. Bodied	TD-4

Centre / Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
JRO 8432+	5	1.0	23.2	2.8	F. Average	H. Bodied	TD-3
JRO-2011-2	8	0.5	26.5	2.8	F. Average	H. Bodied	TD-3 +20%↑
JRO 524+	20	1.5	22.3	2.2	F. Good	M. Bodied	TD-4
JROK-10	20	1.5	22.8	2.1	F. Average	M. Bodied	TD-4
KRO-5	20	1.5	23.5	2.0	F. Good	M. Bodied	TD-4
Rahuri							
BCCO-6	10	>2.0	14.3	2.5	Average	M. Bodied	TD-6+85%↑
KRO-4	5	>2.0	15.4	2.8	F. Average	H. Bodied	TD-5+20%↑
JRO 8432+	8	>2.0	14.6	2.4	F. Average	H. Bodied	TD-5+20%↑
JRO-2011-2	8	>2.0	13.2	2.8	F. Average	H. Bodied	TD-5
JRO 524+	5	>2.0	18.4	2.6	Average	H. Bodied	TD-4
JROK-10	10	>2.0	16.4	3.4	Average	M. Bodied	TD-6+60%↑
KRO-5	10	1.5	13.6	2.5	F. Average	M. Bodied	TD-5+75%↑
Kendrapara							
BCCO-6	10	1.0	17.2	2.2	F. Average	M. Bodied	TD-4
KRO-4	20	1.0	22.9	2.7	F. Average	H. Bodied	TD-4+30%↑
JRO 8432+	10	1.0	22.0	2.9	F. Good	H. Bodied	TD-4+80%↑
JRO-2011-2	15	1.5	22.9	2.9	F. Average	H. Bodied	TD-4+20%↑
JRO 524+	15	2.0	23.5	2.6	F. Average	H. Bodied	TD-4
JROK-10	8	1.0	22.1	2.9	F. Good	H. Bodied	TD-3
KRO-5	8	1.0	24.9	2.8	F. Good	H. Bodied	TD-3+20%↑

+ Check variety

Katihar: Root content varied from 05 to 20 percent. Defect varied from 0.5 to 1.5 percent. Tenacity values of all the samples varied from fair average to fairly good. Fineness value varied from very fine to fine in nature. Grade varied from TD-3 to TD-4.

Rahuri: Root content varied 05 to 10 percent and the samples were full of defects. Tenacity values were weak to average in nature. Fibre samples were very fine to fine in appearance. Grades varied from TD-4 to TD-5.

Kendrapara: Hard root content varied from 8 to 20 percent and defects varied from 1.0 to 2.0 percent. The tenacity values were fair average to fairly good category. Fibre fineness varied from very fine to fine in nature. The samples grade varied between TD-3 to TD-4.

NP(JB) 5.11: IET with *capsularis* jute

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.3.

Table 4.3: Quality characters of fibre of entries under IET with *capsularis* jute

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar							
JRC 698+	40	2.0	13.7	1.5	Average	H. Bodied	W-5
NCJ 28-1-1	40	2.0	19.2	1.6	Average	H. Bodied	W-5 +45%↑
BCCC-3	40	2.0	17.4	1.5	Average	H. Bodied	W-5+45%↑
NDJC-2013	40	>2.0	17.7	1.6	Average	H. Bodied	W-5
JRC 517+	40	2.0	17.0	1.6	Average	H. Bodied	W-5+40%↑
JRCJ-5	40	2.0	16.9	1.5	Average	H. Bodied	W-5 +45%↑
NCJ 07-05	40	>2.0	12.4	1.6	Average	H. Bodied	W-6 +50%↑
Bahraich							
JRC 698+	20	2.0	12.7	1.6	Good	M. Bodied	W-5+50%↑
NCJ 28-1-1	30	1.5	13.9	1.6	Good	M. Bodied	W-5 +50%↑
BCCC-3	30	1.5	11.7	1.3	F. Good	M. Bodied	W-5+40%↑
NDJC-2013	30	1.5	13.6	1.5	Good	M. Bodied	W-5+50%↑
JRC 517+	40	1.5	9.7	1.4	F. Good	M. Bodied	W-5+30%↑
JRCJ-5	30	1.0	11.6	1.4	F. Good	M. Bodied	W-5+65%↑
NCJ 07-05	30	1.0	10.7	1.5	F. Good	M. Bodied	W-5 +65%↑

+ Check variety

Katihar: All the samples were having 40 percent hard root content and full of defects. Tenacity values varied from weak to average in nature. Fineness value for all the entries was very fine in appearance. Grades of the samples were W-5 to W-6 category.

Bahraich: Hard root content varied from 20 to 40 percent and defects varied from 1.0 to 2.0 percent. Tenacity values were weak in nature. Fibre samples were very fine in appearance. Fibre grade was W-5 for all the samples.

NP(JB) 5.12: AVT-I with *capsularis* jute

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.4.

Table 4.4: Fibre quality of entries under AVT-I of *capsularis* jute

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar							
JRCJ-3	40	2.0	12.0	1.7	Average	M. Bodied	W-6+80%↑
BCCC-2	40	>2.0	12.7	1.5	Average	M. Bodied	W-6+60%↑

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
JRC 698+	40	2.0	12.7	1.6	Average	M. Bodied	W-6+80%↑
NCJ 28-14	40	2.0	14.9	1.5	F. Average	M. Bodied	W-6+85%↑
JRC 321+	40	2.0	14.4	1.4	Average	M. Bodied	W-6+80%↑
JRCJ-4	30	2.0	14.2	1.4	Average	M. Bodied	W-6+85%↑
Bahraich							
JRCJ-3	40	2.0	14.2	1.6	F. Good	M. Bodied	W-5
BCCC-2	40	2.0	10.8	1.9	F. Good	M. Bodied	W-6+60%↑
JRC 698+	40	2.0	13.7	1.8	F. Good	M. Bodied	W-5
NCJ 28-14	40	1.5	14.5	1.9	Good	M. Bodied	W-5+10%↑
JRC 321+	40	1.0	13.9	1.9	F. Good	M. Bodied	W-5+25%↑
JRCJ-4	40	1.5	13.3	1.6	F. Good	M. Bodied	W-5+35%↑
Kendrapara							
JRCJ-3	25	1.0	12.8	1.6	F.Good	M. Bodied	W-5+75%↑
BCCC-2	40	2.0	11.7	1.6	F. Average	M. Bodied	W-6+90%↑
JRC 698+	40	2.0	9.5	1.5	F. Average	M. Bodied	W-6+90%↑
NCJ 28-14	40	2.0	11.8	1.6	F. Average	M. Bodied	W-6+90%↑
JRC 321+	40	2.0	12.6	1.5	F. Average	M. Bodied	W-6+90%↑
JRC J-4	40	1.5	9.2	1.6	F. Average	M. Bodied	W-5+30%↑

+ Check variety

Katihar: Root content of all the entries were 40 percent except variety JRCJ-4. All the samples were full of defects. Tenacity values of all the samples were weak in nature. All the samples were very fine in nature. Grades were W-6.

Bahraich: Root content was 40 percent with maximum defects. Tenacity values were weak in nature. Fibre samples were very fine in appearance. Grade varied from W-5 to W-6 category.

Kendrapara: Root content was 40 percent except JRCJ-3 entry. Defects varied from 1.0 to 2.0 percent. The tenacity values were of weak category. Fibres were very fine in nature. The samples grade varied from W-5 to W-6.

NP(JB) 5.13: AVT-II with *capsularis* jute

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.5.

Table: 4.5 Fibre quality of entries under AVT-II with *capsularis* jute

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar							
JRCJ-2	40	1.5	15.0	1.6	F. Average	H. Bodied	W-5+40%↑
BCCC-1	40	2.0	10.7	1.6	Average	H. Bodied	W-5
JRC 698+	30	2.0	13.4	1.6	Average	H. Bodied	W-5
JRC 321+	30	2.0	14.7	1.6	F. Average	H. Bodied	W-5
NCJ 28-10	40	1.5	13.2	1.7	F. Average	H. Bodied	W-5+40%↑
NDJC-2011	30	1.5	12.4	1.7	F. Average	H. Bodied	W-5+45%↑
Bahraich							
JRCJ-2	30	1.5	12.3	1.4	F. Good	M. Bodied	W-5+40%↑
BCCC-1	25	1.5	11.0	1.4	F. Good	M. Bodied	W-5+45%↑
JRC 698+	30	1.5	11.9	1.6	F. Good	M. Bodied	W-5+40%↑
JRC 321+	30	1.5	12.6	1.5	F. Good	M. Bodied	W-5+40%↑
NCJ 28-10	30	1.5	11.7	1.4	F. Good	M. Bodied	W-5+40%↑
NDJC-2011	40	1.0	12.2	1.3	F. Good	M. Bodied	W-5+60%↑
Kendrapara							
JRCJ-2	40	>2.0	12.0	1.6	Average	H. Bodied	W-6+55%↑
BCCC-1	40	>2.0	11.4	1.6	Average	M. Bodied	W-6+40%↑
JRC 698+	40	>2.0	11.1	1.5	Average	M. Bodied	W-6+40%↑
JRC 321+	40	>2.0	11.7	1.6	Average	M. Bodied	W-6+40%↑
NCJ 28-10	40	>2.0	10.8	1.6	Average	M. Bodied	W-6+40%↑
NDJC-2011	40	>2.0	9.6	1.4	Average	M. Bodied	W-6+20%↑

+ Check variety

Katihar: Root content varied from 30 to 40 percent. All the samples were full of defects. Tenacity values of all the samples were weak in nature. All the samples were very fine. Fibre grade was W-5 for all the samples.

Bahraich: Root content varied from 25 to 40 percent and defect varied from 1.0 to 1.5 percent. Tenacity values were weak in nature. Fibre samples were very fine in appearance. Grades were W-5.

Kendrapara: Root content was 40 percent and all the samples were full of defects. The tenacity values were of weak category. Fibres were very fine in nature. The samples grade were W-6.

NP(SB) 12.57: IET with roselle (*H. sabdariffa*)

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.6.

Table 4.6: Fibre quality of entries under IET with roselle

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Aduthurai							
AHS-238	B	A	R	K	Y		B-4
HS 4288+	25	2.0	23.2	2.6	Average	Average	B-3 +33%↑
JRR-2012-1	B	A	R	K	Y		B-4
AHS-254	B	A	R	K	Y		B-4
AMV 5+	B	A	R	K	Y		B-4
AHS-249	B	A	R	K	Y		B-4
Rahuri							
AHS-238	10	2.0	22.5	2.8	Average	Average	B-3 +85%↑
HS 4288+	10	2.0	19.9	2.8	Good	Average	B-2
JRR-2012-1	10	2.0	21.2	2.9	Average	Average	B-3 +85%↑
AHS-254	10	2.0	22.6	3.0	Average	Heavy	B-2
AMV 5+	10	2.0	22.5	2.9	Average	Average	B-3 +85%↑
AHS-249	B	A	R	K	Y		B-4

+ Check variety

Aduthurai: All the samples were barky in nature except check variety HS 4288.

Rahuri: Root content was less except AHS-249 which was barky in nature. Maximum defects were observed for all the samples. Fibres were very fine. Tenacity varied from average to fair average. Sample grade varied from B-2 to B-4

NP(SB) 12.58: AVT-I with roselle

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.7.

Table 4.7: Fibre quality of entries under AVT-I with roselle

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
JRR-2011-1	25	2.0	15.9	2.8	Average	Average	B-3
HS 4288+	25	2.0	17.2	2.8	Average	Average	B-3
AMV 5+	18	2.0	17.0	2.8	Average	Average	B-3 +33%↑
AHS-230	25	2.0	18.5	2.8	Average	Average	B-3+36%↑
AHS-233	18	2.0	15.4	2.6	Average	Average	B-3+33%↑

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Coochbehar							
JRR-2011-1	18	2.0	19.2	2.2	Good	Heavy	B-3+55%↑
HS 4288+	18	2.0	20.3	2.4	Good	Heavy	B-3+55%↑
AMV 5+	25	2.0	23.9	2.5	Good	Heavy	B-3+60%↑
AHS-230	10	1.0	20.6	2.7	Good	Heavy	B-2+30%↑
AHS-233	10	1.5	20.8	3.0	Good	Heavy	B-2
Rahuri							
JRR-2011-1	10	2.0	20.3	2.2	Good	Average	B-2
HS 4288+	10	2.0	17.4	2.8	Average	Average	B-3+85%↑
AMV 5+	10	2.0	20.2	2.8	Average	Average	B-3+85%↑
AHS-230	10	2.0	20.5	2.9	Average	Average	B-3+85%↑
AHS-233	10	2.0	20.9	2.9	Average	Average	B-3+85%↑
Kendrapara							
JRR-2011-1	10	1.0	15.2	2.5	Good	Heavy	B-2+30%↑
HS 4288+	10	1.0	13.7	2.1	Good	Heavy	B-2+30%↑
AMV 5+	10	1.5	19.1	2.6	Average	Heavy	B-2+10%↑
AHS-230	10	1.0	21.1	2.9	Good	Heavy	B-2+60%↑
AHS-233	10	1.0	21.1	2.9	Average	Heavy	B-2+40%↑

+ Check variety

Barrackpore: Root content varied from 18 to 25 percent with maximum defects. Tenacity values were weak to average. Fineness of the samples was very fine in nature. Fibre grades were B-3 and above.

Coochbehar: Root content varied from 10 to 25 percent. Defects varied from 1.0 to 2.0 percent. All the samples were very fine in nature. Tenacity values of the samples were fairly good category. Grade varied from B-2 to B-3.

Rahuri: Hard root content was 10 percent for all the samples. Maximum defects were observed for all the samples. Fineness of the samples were very fine in nature. Tenacity value was average in nature. Fibre grades were B-2 to B-3.

Kendrapara: Hard root content was 10 percent for all the samples and defects were 1.0 to 1.5 percent. Tenacity values were weak to fairly good. Fibres were very fine. Fibre grades were B-2.

NP(SB) 12.59: AVT-II with roselle

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.8.

Table 4.8: Fibre quality of entries under AVT-II with roselle

Centre /Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
JBRR-02	25	2.0	15.6	2.6	Average	Average	B-3
HS 4288+	25	2.0	14.5	2.6	Average	Average	B-3
JBRR-01	25	2.0	17.8	2.8	Average	Average	B-3
AMV 5+	25	2.0	20.9	2.6	Average	Average	B-3+36%↑
AHS-223	25	2.0	18.6	2.6	Average	Average	B-3+36%↑
AHS-216	18	2.0	17.5	2.6	Good	Average	B-3 +45%↑
Aduthurai							
JBRR-02	B	A	R	K	Y		B-4
HS 4288+	25	2.0	20.3	2.9	Average	Average	B-3+35%↑
JBRR-01	25	2.0	20.1	2.9	Average	Average	B-3+35%↑
AMV 5+	25	2.0	24.6	3.0	Average	Average	B-3+35%↑
AHS-223	25	2.0	24.0	3.0	Average	Average	B-3+30%↑
AHS-216	25	2.0	24.8	3.1	Average	Average	B-3+30%↑
Coochbehar							
JBRR-02	10	1.5	23.3	3.3	Good	Heavy	B-2+20%↑
HS 4288+	18	1.5	22.5	3.0	Good	Heavy	B-2
JBRR-01	18	1.5	28.1	3.1	Good	Heavy	B-3+20%↑
AMV 5+	18	2.0	23.6	2.9	Good	Heavy	B-3+80%↑
AHS-223	18	2.0	19.0	2.7	Good	Heavy	B-3+50%↑
AHS-216	18	1.5	24.4	3.0	Good	Heavy	B-2
Rahuri							
JBRR-02	18	2.0	19.0	2.9	Average	Average	B-3+60%↑
HS 4288+	18	2.0	20.2	3.6	Average	Average	B-3+50%↑
JBRR-01	18	2.0	21.3	2.8	Average	Heavy	B-3+70%↑
AMV 5+	18	2.0	21.6	2.8	Average	Heavy	B-3+70%↑
AHS-223	18	2.0	17.1	2.6	Average	Average	B-3+60%↑
AHS-216	18	2.0	23.4	3.0	Average	Average	B-3+60%↑
Kendrapara							
JBRR-02	18	1.0	16.3	2.6	Average	Average	B-2
HS 4288+	10	1.0	17.8	2.9	Good	Average	B-2+45%↑
JBRR-01	10	1.0	17.8	3.2	Good	Heavy	B-2+50%↑
AMV 5+	10	1.5	22.9	3.2	Good	Heavy	B-2+20%↑
AHS-223	10	1.5	20.5	2.8	Average	Average	B-2
AHS-216	10	1.0	20.8	2.6	Good	Heavy	B-2+55%↑

+ Check variety

Barrackpore: Root content was 25 percent except the AHS-216. Maximum defects were observed for all the samples. Tenacity values were weak to average in nature. Fineness was in very fine category. Fibre grades were obtained B-3 and up

Aduthurai: Root content was 25 percent except the JBRR-02. Maximum defects were observed for all the samples. Tenacity values were average to fairly good in nature. Fineness was in very fine category. Fibre grades were B-3 and up

Coochbehar: Hard root content varied from 10 to 18 percent. Defects varied from 1.5 to 2.0 percent. Tenacity value varied from average to good in nature. Fibre fineness was very fine. Fibre grades were in B-2 to B-3 category.

Rahuri: Hard root content were 18 percent and defects were 2 percent for all the samples. Tenacity values were weak to fairly good. Fibres were very fine except variety HS 4288. Fibre grades were obtained B-3.

Kendrapara: Fibre samples were having 10 percent root content except JBRR-02. Defects varied from 1.0 to 1.5 percent. Tenacity value varied from weak to average. All the samples were very fine in appearance. Fibre grades obtained was B-2.

NP(CB) 1.30: IET with Kenaf

Centre wise performance of different entries in terms of fibre quality under this trial are presented in table 4.9.

Table 4.9: Fibre quality of entries under IET with kenaf

Centre /Entry	Rootcontent (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
JRK-2011-2	20	2.0	30.8	3.3	F. Average	Heavy	M-3 +50%↑
MT 150+	20	2.0	32.5	3.3	F. Average	Heavy	M-3+50%↑
JRK-2012-1	20	2.0	33.1	3.2	F. Average	Heavy	M-3+50%↑
AMC 108+	20	2.0	35.3	3.2	F. Average	Heavy	M-3 +50%↑
JRK-2011-3	20	2.0	33.2	3.2	F. Average	Heavy	M-3 +50%↑
JRK-2011-4	30	2.0	27.8	3.2	F. Average	Heavy	M-3 +25%↑
JRK-2011-1	30	2.0	33.0	3.2	F. Average	Heavy	M-3 +25%↑
Amadalavalasa							
JRK-2011-2	50	Nil	20.8	3.2	Good	V. Heavy	M-3 +50%↑
MT 150+	50	1.0	21.6	3.3	Good	V. Heavy	M-3+35%↑
JRK-2012-1	50	0.5	23.0	2.8	Good	V. Heavy	M-3+55%↑
AMC 108+	50	0.5	24.2	2.8	Good	V. Heavy	M-3+55%↑
JRK-2011-3	50	0.5	23.8	3.4	Good	V. Heavy	M-3+55%↑
JRK-2011-4	50	0.5	21.4	2.8	Good	V. Heavy	M-3+55%↑
JRK-2011-1	50	0.5	25.7	3.4	Good	V. Heavy	M-3+75%↑

Centre /Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Aduthurai							
JRK-2011-2	B	A	R	K	Y		M-6
MT 150+	50	2.0	24.2	3.9	Average	Heavy	M-5+25%↑
JRK-2012-1	B	A	R	K	Y		M-6
AMC 108+	B	A	R	K	Y		M-6
JRK-2011-3	B	A	R	K	Y		M-6
JRK-2011-4	B	A	R	K	Y		M-6
JRK-2011-1	B	A	R	K	Y		M-6
Coochbehar							
JRK-2011-2	20	1.5	27.7	2.8	Good	Heavy	M-3+90%↑
MT 150+	20	1.0	27.1	2.9	Good	Heavy	M-2
JRK-2012-1	30	1.5	27.7	3.5	Good	V. Heavy	M-3+60%↑
AMC 108+	40	2.0	27.2	3.6	Good	V. Heavy	M-3
JRK-2011-3	20	2.0	28.3	3.6	F. Average	V. Heavy	M-3+20%↑
JRK-2011-4	40	2.0	27.6	3.6	F. Average	V. Heavy	M-4+85%↑
JRK-2011-1	40	1.5	27.7	3.2	Good	Heavy	M-3+50%↑
Rahuri							
JRK-2011-2	12	1.5	23.4	2.8	F. Average	V. Heavy	M-3+80%↑
MT 150+	12	2.0	22.6	2.5	F. Average	V. Heavy	M-3+40%↑
JRK-2012-1	12	2.0	24.0	2.7	F. Average	Heavy	M-3+35%↑
AMC 108+	12	2.0	23.8	2.8	F. Average	V. Heavy	M-3+40%↑
JRK-2011-3	20	2.0	18.1	3.0	F. Average	Heavy	M-4+90%↑
JRK-2011-4	12	2.0	22.4	2.6	F. Average	V. Heavy	M-3+40%↑
JRK-2011-1	12	2.0	21.4	3.2	F. Average	Heavy	M-3+35%↑

+ Check variety

Barrackpore: Root content varied from 20 to 30 percent. Maximum defects *i.e.*, 2 percent was observed for all the samples. Tenacity values were very good in nature. Fineness was in very fine category. Fibre grades were M-3 and up

Amadalavalasa: Root content was 50 percent for all the samples. Minimum defects were observed for all the samples. Tenacity values were average to good in nature. Fibre fineness was in very fine category. Fibre grades obtained were M-3 and up

Aduthurai: Fibre samples were barky except variety MT 150. Fibre grades were M-5 and M-6.

Coochbehar: Hard root content varied from 20 to 40 percent. Defects varied from 1.0 to 2.0

percent. Tenacity value was good in nature for all the samples. Fibre fineness was very fine. Fibre grades obtained were M-2 to M-3 category.

Rahuri: Fibre samples were having 12 to 20 percent hard root. Defects percentage varied from 1.5 to 2.0 percent. Fibre Tenacity value was average to fairly good category. Fibre grades were M-3 and up.

NP(CB) 1.31: AVT-II with Kenaf

Centre wise performance of different kenaf entries in terms of fibre quality are presented in table 4.10.

Table 4.10: Fibre quality of entries under AVT-II with kenaf

Centre /Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Amadalavalasa							
JBMP-2	50	0.5	23.6	2.4	F. Average	V.Heavy	M-3 +35%↑
AMC 108+	50	0.5	22.9	3.0	Good	V.Heavy	M-3 +50%↑
HC 583+	50	0.5	24.3	3.3	Good	V.Heavy	M-3 +50%↑
JBMP-3	50	0.5	22.4	2.4	Good	V.Heavy	M-3 +50%↑
JBMP-1	50	Nil	24.1	2.4	Good	V.Heavy	M-3 +70%↑
Barrackpore							
JBMP-2	20	2.0	35.4	3.2	F. Average	Heavy	M-3 +50%↑
AMC 108+	30	2.0	34.4	3.6	F. Average	Heavy	M-3 +10%↑
HC 583+	12	1.5	31.6	3.4	F. Average	Heavy	M-2
JBMP-3	20	2.0	32.9	3.0	F. Average	Heavy	M-3 +50%↑
JBMP-1	30	2.0	29.6	3.0	F. Average	Medium	M-3 +20%↑
Aduthurai							
JBMP-2	B	A	R	K	Y	-	M-6
AMC 108+	B	A	R	K	Y	-	M-6
HC 583+	B	A	R	K	Y	-	M-6
JBMP-3	B	A	R	K	Y	-	M-6
JBMP-1	B	A	R	K	Y	-	M-6
Coochbehar							
JBMP-2	12	1.5	25.3	3.4	Good	Heavy	M-2
AMC 108+	12	1.0	24.0	3.8	Good	Heavy	M-2
HC 583+	12	1.0	26.8	3.8	Good	Heavy	M-2 +10%↑
JBMP-3	12	1.0	27.7	3.2	Good	Heavy	M-2 +30%↑
JBMP-1	12	1.0	26.7	2.8	Good	Heavy	M-2 +30%↑

Centre /Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Rahuri							
JBMP-2	20	2.0	23.1	2.8	Average	Heavy	M-4 +90%↑
AMC 108+	12	2.0	23.7	2.8	F. Average	Heavy	M-3 +20%↑
HC 583+	12	2.0	23.0	2.7	F. Average	Heavy	M-3 +35%↑
JBMP-3	12	2.0	20.2	2.9	F. Average	Heavy	M-3 +15%↑
JBMP-1	12	2.0	23.7	2.6	F. Average	Heavy	M-3 +35%↑
Kendrapara							
JBMP-2	12	1.0	22.8	2.9	F. Average	Heavy	M-3 +90%↑
AMC 108+	12	1.5	20.2	2.6	F. Average	Heavy	M-3 +50%↑
HC 583+	12	1.5	21.0	3.3	F. Average	Heavy	M-3 +75%↑
JBMP-3	12	1.0	22.5	3.1	F. Average	Heavy	M-3 +95%↑
JBMP-1	12	1.0	18.1	2.8	F. Average	Heavy	M-3 +75%↑

+ Check variety

Amadalavalasa: Hard root content was 50 percent for all the samples. Minimum defects was observed in all the samples. Tenacity values were fairly good in nature. Fineness was in very fine category. Fibre grades obtained were M-3 and up

Barrackpore: Hard root content varied from 12 to 30 percent. Defects varied from 1.5 to 2.0 percent. Fibre fineness was very fine except AMC 108. Tenacity value showed that fibre was very good in nature. Fibre grades were M-2 to M-3.

Aduthurai: All the fibre samples were barky. Fibre grades were M-6.

Coochbehar: Fibre samples were having 12 percent root content and 1.0 to 1.5 percent defects were observed. Tenacity value showed good in nature.Fineness varied from fine to very fine in appearance. Fibre grades obtained was M-2.

Rahuri: Fibre samples were having 12 to 20 percent root content and maximum defects were observed. Tenacity value showed fairly good in nature except the entry JBMP-3. Fibres were very fine in nature. Fibre grades were M-3.

Kendrapara: Fibre samples were having 12 percent hard root. Defects percentage varied from 1.0 to 1.5 percent. Fibre fineness was very fine in nature. Fibre tenacity was average to fairly good category. Fibre grades were M-3.

NP (SNH-B) 1.15: IET with sunnhemp

Centre wise performance of different sunnhemp entries in terms of fibre quality under this trial are presented in table 4.11.

Table 4.11 Fibre quality of entries under IET with sunnhemp

Entry	Tenacity (gm/tex)	
	Aduthurai	Pratapgarh
SUIN 053+	21.4	11.2
Sanai-6	19.5	8.7
Sanai-8	20.3	9.5
Sanai-7	22.1	9.1
Sanai-9	21.4	8.9
Sanai-10	21.7	7.8
SH 4+	18.9	8.8

+ Check variety

Aduthurai: Tenacity values varied from average to fair average category.

Pratapgarh: All the tenacity values were weak in nature

NP (SNH-B) 1.16: AVT-1 with sunnhemp

Centre wise performance of different sunnhemp entries in terms of fibre quality under this trial are presented in table 4.12.

Table 4.12: Fibre quality of entries under AVT-1 with sunnhemp

Entry	Tenacity (gm/tex)	
	Aduthurai	Pratapgarh
K 12 Yellow+	24.5	7.4
SUIN-3	23.2	9.7
SUIN-2	18.2	8.8
SUIN-1	22.5	6.4
SUIN-4	22.2	8.1
SUIN-5	19.3	8.2
SH 4+	19.3	6.3

+ Check variety

Aduthurai: Tenacity value varied from average to fairly good category.

Pratapgarh: All the tenacity values were weak in nature

NP (SNH-B) 1.17: AVT-II with sunnhemp

Centre wise performance of different sunnhempentries in terms of fibre quality under this trial are presented in table 4.13.

Table 4.13: Fibre quality of entries under AVT-II with sunnhemp

Entry	Tenacity (gm/tex)	
	Aduthurai	Pratapgarh
K 12 Yellow+	22.3	Very weak
SUIN 053+	19.6	10.4
SH 4+	19.2	10.3
SUIN-77	24.7	11.2
SUIN-63	18.6	7.4
SUIN-62	20.7	8.7
SUIN-67	19.4	5.6
SUIN-81	18.4	10.4

+ Check variety

Aduthurai: Tenacity value of samples varied from average to fair average category.

Pratapgarh: All the tenacity values were weak in nature

NP (NB) 1.5: IET with flax

Centre wise performance of different flaxentries in terms of fibre quality under this trial are presented in table 4.14.

Table 4.14: Fibre quality of entries under IET with flax

Entry	Barrackpore
	Tenacity (gm/tex)
JRF-5	15.5
JRF-6	22.3
JRF-7	21.1
JRF-8	15.0
JRF-9	15.8
JRF 2+	17.8

+ Check variety

Barrackpore: Tenacity value varied from weak to average category.

Fibre Quality 2014-15

NP (JB) 5.14: IET with *olitorius* jute

Centre wise performance of different *olitorius* jute entries in terms of fibre quality under this trial are presented in table 4.15.

Table 4.15: Fibre quality of entries under IET with *olitorius* jute

Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
NOJ-27	10	>2.0	21.4	2.6	F. Good	H. Bodied	TD-4
JROK-18	10	2.0	24.3	2.5	F. Good	H. Bodied	TD-4+30%↑
BCCO-10	20	>2.0	24.3	2.1	F. Average	H. Bodied	TD-5+40%↑
JROK-20	20	>2.0	21.7	2.7	F. Average	H. Bodied	TD-5+25%↑
JROK-17	25	>2.0	22.5	2.2	F. Average	H. Bodied	TD-5+20%↑
BCCO-11	15	>2.0	23.1	2.5	F. Good	H. Bodied	TD-5+65%↑
JROK-19	20	>2.0	24.2	2.0	F. Average	H. Bodied	TD-5+40%↑
NJ7050	08	2.0	24.6	2.0	F. Average	H. Bodied	TD-4 +45%↑
UBO-1	25	>2.0	23.3	2.4	Average	H. Bodied	TD-5+15%↑
ROJ-14	20	>2.0	23.2	2.5	F. Average	H. Bodied	TD-5+25%↑
JRO 524+	25	>2.0	23.4	2.4	F. Average	H. Bodied	TD-5+20%↑
JRO 8432+	15	>2.0	21.8	2.2	F. Average	H. Bodied	TD-5+60%↑
Coochbehar							
NOJ-27	15	1.5	18.3	2.9	F. Average	H. Bodied	TD-4
JROK-18	15	2.0	18.1	2.7	F. Average	H. Bodied	TD-5+65%↑
BCCO-10	15	2.0	18.2	2.6	F. Average	H. Bodied	TD-5+65%↑
JROK-20	15	1.0	21.2	2.7	F. Average	H. Bodied	TD-4+65%↑
JROK-17	20	2.0	21.6	2.9	F. Average	H. Bodied	TD-5+25%↑
BCCO-11	10	1.5	17.3	2.8	F. Average	H. Bodied	TD-4+40%↑
JROK-19	15	>2.0	20.3	2.5	F. Average	H. Bodied	TD-5+45%↑
NJ7050	20	>2.0	19.6	2.9	F. Average	H. Bodied	TD-5
UBO-1	20	2.0	18.1	2.5	F. Good	H. Bodied	TD-5+40%↑
ROJ-14	25	>2.0	18.5	2.7	F. Average	H. Bodied	TD-5
JRO 524+	10	2.0	18.6	2.5	F. Average	H. Bodied	TD-4
JRO 8432+	20	>2.0	17.6	2.7	F. Average	H. Bodied	TD-5+15%↑

+ Check variety

Kalyani: Root content varied from 08 to 25 percent. All the samples were full of defects. Tenacity value varied from fair average to fairly good. Fineness value for all the entries was very fine in nature. Grade varied from TD-4 to TD-5.

Coochbehar: Root content varied from 10 to 25 percent and defect varied from 1.0 to >2.0 percent. Tenacity value varied from weak to faire average. Fineness value varied from fine to very fine in nature. Grade varied from TD-4 to TD-5.

NP(JB) 5.15: AVT-I with *olitorius* jute

Centre wise performance of different *olitorius* jute entries in terms of fibre quality under this trial are presented in table 4.16.

Table 4.16: Fibre quality of entries under AVT-I with *olitorius* jute

Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
BCCO-8	35	>2.0	24.6	2.6	F. Good	H. Bodied	TD-5+30%↑
NJ7005	25	>2.0	23.4	2.6	Average	H. Bodied	TD-5+10%↑
NJ7010	20	>2.0	22.6	2.3	F. Average	H. Bodied	TD-5+20%↑
JROK-15	25	>2.0	24.4	2.6	F. Average	H. Bodied	TD-5 +30%↑
JROK-14	35	>2.0	21.2	2.7	F. Average	H. Bodied	TD-5+10%↑
JRO 524+	25	>2.0	24.0	2.6	F. Average	H. Bodied	TD-5+30%↑
JRO 8432+	25	>2.0	23.8	2.7	F. Good	H. Bodied	TD-5+40%↑
Coochbehar							
BCCO-8	15	>2.0	20.7	2.5	F. Good	H. Bodied	TD-5+65%↑
NJ7005	15	>2.0	21.6	2.9	F. Good	H. Bodied	TD-5+65%↑
NJ7010	20	>2.0	21.6	2.4	F. Average	H. Bodied	TD-5+25%↑
JROK-15	20	>2.0	26.8	2.8	F. Good	H. Bodied	TD-5+25%↑
JROK-14	15	>2.0	21.7	2.3	F. Good	H. Bodied	TD-5+65%↑
JRO 524+	20	>2.0	20.5	2.5	F. Good	H. Bodied	TD-5+33%↑
JRO 8432+	15	>2.0	20.8	2.8	F. Good	H. Bodied	TD-5+46%↑
Barrackpore							
BCCO-8	15	1.5	18.3	2.8	F. Good	M. Bodied	TD-4
NJ7005	10	2.0	21.1	3.0	F. Average	M. Bodied	TD-5+45%↑
NJ7010	10	2.0	22.1	2.9	F. Average	M. Bodied	TD-5+80%↑
JROK-15	08	2.0	18.6	2.9	F. Average	M. Bodied	TD-5+85%↑
JROK-14	10	2.0	18.2	2.7	F. Good	H. Bodied	TD-4
JRO 524+	10	1.5	20.4	2.6	F. Good	M. Bodied	TD-4+55%↑
JRO 8432+	08	>2.0	18.3	2.8	F. Average	M. Bodied	TD-5+65%↑

+ Check variety

Kalyani: Root content varied from 20 to 35 percent. All the samples are full of defects. Tenacity values of all the samples varied from fair average to fairly good. Fineness value varied from very fine to fine in nature. Grades were TD-5 and up.

Coochbehar: Root content varied from 15 to 20 percent and the samples were full of defects.

Tenacity values were average in nature. Fibre samples showed very fine to fine in appearance. Grades were TD-5 an up.

Barrackpore: Hard root content varied from 8 to 15 percent and defects varied from 1.5 to >2.0 percent. The tenacity values varied from average to fair average category. Fibres fineness varied from very fine to fine in nature. The samples grade varied from TD-4 to TD-5.

NP(JB) 5.16: AVT-II with *olitorius* jute

Centre wise performance of different *olitorius* jute entries in terms of fibre quality under this trial are presented in table 4.17.

Table 4.17: Fibre quality of entries under AVT-II with *olitorius* jute

Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
BCCO-8	15	>2.0	23.1	2.5	F. Average	H. Bodied	TD-5+60%↑
NJ7005	35	>2.0	26.2	2.5	F. Average	H. Bodied	TD-5+25%↑
NJ7010	35	>2.0	24.1	2.7	F. Average	H. Bodied	TD-5+25%↑
JROK-15	25	>2.0	22.0	2.6	F. Average	H. Bodied	TD-5 +20%↑
JROK-14	35	>2.0	26.5	2.9	F. Average	H. Bodied	TD-5
JRO 524+	20	>2.0	25.6	2.6	F. Average	H. Bodied	TD-5+40%↑
JRO 8432+	25	>2.0	22.3	2.7	F. Average	H. Bodied	TD-5+40%↑
Coochbehar							
BCCO-8	10	2.0	21.9	2.8	F. Good	H. Bodied	TD-4
NJ7005	15	2.0	23.1	2.8	F. Average	H. Bodied	TD-5+60%↑
NJ7010	15	2.0	19.9	2.6	F. Average	H. Bodied	TD-5+80%↑
JROK-15	15	1.5	18.7	2.6	F. Good	H. Bodied	TD-4+40%↑
JROK-14	10	2.0	15.4	2.5	F. Good	H. Bodied	TD-4
JRO 524+	20	2.0	18.8	2.8	F. Average	H. Bodied	TD-5+25%↑
JRO 8432+	10	2.0	19.0	2.8	F. Good	H. Bodied	TD-4
Barrackpore							
BCCO-8	10	>2.0	18.2	2.6	F. Average	M. Bodied	TD-5+65%↑
NJ7005	08	>2.0	19.0	2.8	F. Average	H. Bodied	TD-5+80%↑
NJ7010	10	>2.0	22.2	2.6	F. Average	M. Bodied	TD-5+80%↑
JROK-15	08	>2.0	21.7	2.8	F. Average	M. Bodied	TD-5+80%↑
JROK-14	10	>2.0	19.5	2.6	F. Average	M. Bodied	TD-5+65%↑
JRO 524+	15	>2.0	20.8	2.9	F. Average	H. Bodied	TD-5+40%↑
JRO 8432+	08	>2.0	22.4	2.7	F. Average	M. Bodied	TD-4

+ Check variety

Kalyani: Root content varied from 15 to 35 percent. All the samples are full of defects. Tenacity values of all the samples varied from fair average to fairly good. Fibre fineness showed very fine in nature except JROK-14. Grades were TD-5 and up.

Coochbehar: Root content varied from 10 to 20 percent and the samples were full of defects. Tenacity values were average to fairly average in nature. Fibre samples showed very fine to fine in appearance. Grades were TD-4 to TD-5.

Barrackpore: Hard root content varied from 8 to 10 percent and the samples were full of defects. The tenacity values varied from average to fair average category. Fibre fineness varied from very fine to fine in nature. The samples grade varied from TD-4 to TD-5.

NP(JB) 5.17: IET with *capsularis* jute

Centre wise performance of different *capsularis* jute entries in terms of fibre quality under this trial are presented in table 4.18.

Table 4.18: Fibre quality of entries under IET with *capsularis* jute

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
BCCC-5	40	>2.0	21.0	1.7	F. Average	H. Bodied	W-5+20%↑
JRCJ-6	40	>2.0	19.8	1.7	F. Average	H. Bodied	W-5 +10%↑
NCJ 07-22	30	>2.0	18.2	1.6	F. Average	H. Bodied	W-5+20%↑
NDJC-2014	40	>2.0	17.0	1.6	Average	H. Bodied	W-5
JRC J-7	30	>2.0	20.2	1.6	F. Average	H. Bodied	W-5+30%↑
BCCC-4	40	>2.0	16.6	1.6	F. Average	H. Bodied	W-5 +10%↑
JRC 517+	30	>2.0	15.0	1.7	F. Average	H. Bodied	W-5+20%↑
JRC 698+	30	>2.0	17.8	1.5	Average	H. Bodied	W-5+10%↑
Baharaich							
BCCC-5	15	1.5	12.7	1.6	F. Average	M. Bodied	W-4
JRCJ-6	20	1.0	12.0	1.5	F. Good	M. Bodied	W-4
NCJ 07-22	20	2.0	12.3	1.6	F. Average	H. Bodied	W-5+45%↑
NDJC-2014	15	1.5	12.3	1.5	F. Average	M. Bodied	W-4
JRC J-7	15	2.0	10.3	1.5	F. Average	M. Bodied	W-5+65%↑
BCCC-4	25	2.0	10.7	1.5	F. Average	H. Bodied	W-5+15%↑
JRC 517+	15	2.0	12.3	1.6	F. Good	H. Bodied	W-5 +55%↑
JRC 698+	20	2.0	11.9	1.5	F. Average	H. Bodied	W-5 +45%↑
Coochbehar							
BCCC-5	40	>2.0	16.2	2.0	Average	H. Bodied	W-6+75%↑

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
JRCJ-6	40	>2.0	15.8	1.6	Average	H. Bodied	W-5
NCJ 07-22	30	>2.0	19.4	1.6	F. Average	H. Bodied	W-5+35%↑
NDJC-2014	25	>2.0	15.7	1.7	F. Average	H. Bodied	W-5+25%↑
JRC J-7	40	>2.0	14.2	1.6	Average	H. Bodied	W-6+55%↑
BCCC-4	40	>2.0	14.6	1.6	Average	H. Bodied	W-6+55%↑
JRC 517+	40	>2.0	16.9	1.7	Average	H. Bodied	W-5
JRC 698+	40	>2.0	14.6	1.8	Average	H. Bodied	W-6 +55%↑
Barrackpore							
BCCC-5	25	>2.0	14.8	1.9	F. Average	M. Bodied	W-6+25%↑
JRCJ-6	30	>2.0	15.7	1.6	F. Average	M. Bodied	W-5
NCJ 07-22	25	>2.0	15.2	1.6	Average	M. Bodied	W-5
NDJC-2014	30	>2.0	16.2	1.8	Average	M. Bodied	W-5
JRC J-7	15	>2.0	15.9	1.9	Average	M. Bodied	W-5+40%↑
BCCC-4	30	>2.0	17.2	1.9	F. Average	H. Bodied	W-6+85%↑
JRC 517+	25	>2.0	17.6	1.7	F. Average	M. Bodied	W-5+15%↑
JRC 698+	25	>2.0	17.2	1.7	F. Average	M. Bodied	W-5 +15%↑

+ Check variety

Kalyani: All the samples were having 30 to 40 percent hard root content and full of defects. Tenacity values varied from weak to fair average in nature. Fineness value for all the entries were very fine in appearance. Grades of the samples were W-5.

Bahraich: Hard root content varied from 15 to 25 percent and defects from 1.0 to 2.0 percent. Tenacity values were weak in nature. Fibre samples showed very fine in appearance. Grades were W-4 to W-5 category.

Coochbehar: Samples were having 25 to 40 percent hard root content and full of defects. Tenacity values were weak in nature except NCJ-07-22. Fineness values for all the entries were very fine in appearance. Grades of the samples were W-5 to W-6 category.

Barrackpore: Samples were having 25 to 30 percent hard root content and full of defects. Tenacity values were weak in nature. Fineness value for all the entries were very fine in appearance. Grades of the samples were W-5 to W-6 category.

NP (JB) 5.18: AVT-I with *capsularis* jute

Centre wise performance of different *capsularis* jute entries in terms of fibre quality under this trial are presented in table 4.19.

Table 4.19: Fibre quality of entries under AVT-I with *capsularis* jute

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
NCJ-28-1-1	20	>2.0	19.5	1.6	F. Good	H. Bodied	W-5+80%↑
BCCC-3	25	>2.0	15.3	1.4	F. Average	H. Bodied	W-5+25%↑
JRCJ-5	40	>2.0	17.6	1.4	Average	H. Bodied	W-5
NDJC-2013	40	>2.0	21.8	1.7	Average	H. Bodied	W-5+40%↑
JRC 517+	25	>2.0	22.0	1.4	F. Average	H. Bodied	W-5+60%↑
JRC 698+	40	>2.0	20.7	1.3	F. Average	H. Bodied	W-5+25%↑
Bahraich							
NCJ-28-1-1	20	2.0	12.3	1.7	F. Average	H. Bodied	W-5+45%↑
BCCC-3	30	>2.0	11.6	1.5	Average	H. Bodied	W-6+60%↑
JRCJ-5	20	>2.0	14.9	1.7	F. Good	H. Bodied	W-5+10%↑
NDJC-2013	25	>2.0	11.5	1.6	F. Good	H. Bodied	W-6+80%↑
JRC 517+	20	>2.0	12.9	1.5	F. Good	H. Bodied	W-5+10%↑
JRC 698+	25	>2.0	12.5	1.7	F. Good	H. Bodied	W-6+80%↑
Coochbehar							
NCJ-28-1-1	25	>2.0	15.9	1.9	F. Average	H. Bodied	W-6+75%↑
BCCC-3	40	>2.0	14.3	1.7	Average	H. Bodied	W-6+55%↑
JRCJ-5	40	>2.0	20.6	1.6	F. Average	H. Bodied	W-5+15%↑
NDJC-2013	40	>2.0	13.3	1.5	F. Average	H. Bodied	W-6+60%↑
JRC 517+	40	>2.0	14.5	1.6	Average	H. Bodied	W-6+55%↑
JRC 698+	B	A	R	K	Y		W-7
Barrackpore							
NCJ-28-1-1	15	>2.0	14.8	1.8	Average	M. Bodied	W-5+20%↑
BCCC-3	25	>2.0	14.8	1.9	Average	M. Bodied	W-6+20%↑
JRCJ-5	30	>2.0	13.7	1.6	Average	M. Bodied	W-6+45%↑
NDJC-2013	30	>2.0	17.5	1.7	Average	M. Bodied	W-5
JRC 517+	25	>2.0	16.9	1.9	Average	H. Bodied	W-6+85%↑
JRC 698+	20	>2.0	17.5	1.8	F. Average	H. Bodied	W-5+60%↑

+ Check variety

Kalyani: Root content varied from 20 to 40 percent. All the samples were full of defects. Tenacity values of the samples were average to fairly good in nature. All the samples were very fine in nature. Grades were W-5.

Bahraich: Root content varied from 20 to 30 percent with maximum defects. Tenacity values were weak in nature. Fibre samples showed very fine in appearance. Grade varied from W-5 to W-6 category.

Coochbehar: Root content was 40 percent except NCJ-28-1-1 and the check variety JRC 698. All the samples are full of defects. The tenacity values were weak category except JRCJ-5. Fibres were very fine in nature. The samples grade varied from W-6 to W-7.

Barrackpore: Root content varied from 15 to 30 percent. All the samples were full of defects. Tenacity values of the samples were weak in nature. All the samples were very fine in nature. Grades were W-5 to W-6.

NP(JB) 5.19: AVT-II I with *capsularis* jute

Centre wise performance of different *capsularis* jute entries in terms of fibre quality under this trial are presented in table 4.20.

Table 4.20: Fibre quality of entries under AVT-II with *capsularis* jute

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kalyani							
JRCJ-4	40	>2.0	17.8	1.6	F. Average	H. Bodied	W-5+10%↑
JRCJ-3	40	>2.0	16.2	1.5	F. Average	H. Bodied	W-5+10%↑
NCJ-28-14	40	>2.0	20.2	1.6	F. Average	H. Bodied	W-5+25%↑
BCCC-2	40	>2.0	18.6	1.6	Average	H. Bodied	W-5
JRC 698+	40	2.0	16.4	1.5	F. Average	H. Bodied	W-5+50%↑
JRC 321+	30	>2.0	20.7	1.7	F. Good	H. Bodied	W-5+40%↑
Bahraich							
JRCJ-4	15	>2.0	13.1	1.5	F. Good	H. Bodied	W-5+45%↑
JRCJ-3	25	>2.0	13.7	1.6	F. Good	H. Bodied	W-6+80%↑
NCJ 28-14	15	>2.0	12.6	1.5	F. Good	H. Bodied	W-5+45%↑
BCCC-2	20	>2.0	13.9	1.5	F. Good	H. Bodied	W-5+10%↑
JRC 698+	25	>2.0	13.7	1.6	F. Good	H. Bodied	W-6+80%↑
JRC 321+	20	>2.0	10.3	1.7	F. Good	H. Bodied	W-5+10%↑
Coochbehar							
JRCJ-4	40	>2.0	18.5	2.0	F. Average	H. Bodied	W-5
JRCJ-3	40	>2.0	16.7	1.6	F. Average	H. Bodied	W-5
NCJ-28-14	25	>2.0	18.1	1.9	F. Average	H. Bodied	W-5
BCCC-2	25	>2.0	17.4	1.5	F. Good	H. Bodied	W-5+30%↑
JRC 698+	25	>2.0	15.8	1.6	F. Average	H. Bodied	W-5+20%↑
JRC 321+	B	A	R	K	Y		W-7
Barrackpore							
JRCJ-4	20	>2.0	13.1	1.7	Average	M. Bodied	W-6+85%↑

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
JRCJ-3	25	>2.0	16.2	1.6	F. Average	M. Bodied	W-5+10%↑
NCJ-28-14	20	>2.0	15.2	1.5	Average	H. Bodied	W-5+55%↑
BCCC-2	08	>2.0	13.9	1.7	F. Average	H. Bodied	W-5+60%↑
JRC 698+	15	>2.0	15.1	1.9	Average	H. Bodied	W-5+55%↑
JRC 321+	30	>2.0	18.4	2.8	Average	H. Bodied	W-6+75%↑

+ Check variety

Kalyani: Root content varied from 30 to 40 percent. All the samples were full of defects. Tenacity values of the samples were average in nature. All the samples were very fine in nature. Grades were W-5.

Bahraich: Root content varied from 15 to 25 percent with maximum defects. Tenacity values were weak in nature. Fibre samples showed very fine in appearance. Grade varied from W-5 to W-6 category.

Coochbehar: Root content varied from 25 to 40 percent except check variety JRC 321. Check variety JRC 321 was barky. All the samples were full of defects. The tenacity values were weak to average category except variety JRC 321. Fibres were very fine in nature. The samples grade varied from W-5 to W-7.

Barrackpore: Root content varied from 08 to 30 percent. All the samples were full of defects. Tenacity values of the samples were weak in nature. All the samples were very fine in nature. Grades were W-5 to W-6.

NP(SB) 12.60: IET with roselle

Centre wise performance of different roselle entries in terms of fibre quality under this trial are presented in table 4.21.

Table 4.21: Fibre quality of entries under IET with roselle

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
AHS-267	18	1.5	11.0	2.9	Average	Heavy	B-3 +60%↑
AHS-255	18	2.0	14.2	3.0	Average	Heavy	B-3 +45%↑
AHS-264	25	2.0	13.3	2.7	Average	Heavy	B-3 +20%↑
JRR 2013-1	25	2.0	12.9	3.0	Average	Heavy	B-3 +20%↑
JRHS-2	10	1.5	14.3	3.0	Good	Heavy	B-2
JRHS-1	25	2.0	13.6	3.1	Average	Heavy	B-3 +15%↑
AMV 5+	18	2.0	14.1	3.2	Average	Heavy	B-3 +35%↑
HS 4288+	25	2.0	12.1	3.3	Average	Heavy	B-3 +15%↑

+ Check variety

Barrackpore: Root content varied from 10 to 25 percent. Maximum defects were observed for all the samples. Fibres were very fine. Tenacity values were weak in nature. Sample grade varied from B-2 to B-3.

NP(SB) 12.61: AVT-I with roselle

Centre wise performance of different roselle entries in terms of fibre quality under this trial are presented in table 4.22.

Table 4.22: Fibre quality of entries under AVT-I with roselle

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
AHS-238	18	2.0	14.0	2.9	Average	Heavy	B-3+40%↑
AHS-249	18	2.0	15.9	3.1	Average	Heavy	B-3+60%↑
AHS-254	25	2.0	16.5	2.8	Average	Heavy	B-3 +50%↑
JRR 2012-1	18	2.0	16.2	2.7	Average	Heavy	B-3+70%↑
AMV 5+	18	2.0	17.2	2.8	Average	Heavy	B-3+70%↑
HS 4288+	18	2.0	20.8	2.7	Average	Heavy	B-3+70%↑

+ Check variety

Barrackpore: Root content varied from 18 to 25 percent with maximum defects. Tenacity values were weak to average. Fineness of the samples was very fine in nature. Fibre grades were B-3 and up.

NP(SB) 12.62: AVT-11 with roselle

Centre wise performance of different roselle entries in terms of fibre quality under this trial are presented in table 4.23.

Table 4.23: Fibre quality of entries under AVT-II with roselle

Variety	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
AHS-233	18	2.0	20.1	3.2	Average	Average	B-3 +50%↑
JRR 2011-1	18	2.0	19.1	3.1	Average	Average	B-3+50%↑
AHS-230	25	2.0	18.4	2.9	Average	Average	B-3+35%↑
AMV 5+	10	2.0	17.9	2.8	Average	Average	B-3+85%↑
HS 4288+	18	2.0	23.4	2.7	Average	Heavy	B-3+70%↑

+ Check variety

Barrackpore: Root content varied from 10 to 25 percent. Maximum defects were observed for all the samples. Tenacity values were average in nature. Fineness was in very fine category. Fibre grades were B-3 and up.

NP(CB) 1.32: IET with kenaf

Centre wise performance of different kenaf entries in terms of fibre quality under this trial are presented in table 4.24.

Table 4.24: Fibre quality of entries under IET with kenaf

Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
JRK 2013-1	50	2.0	18.1	3.1	Average	Heavy	M-4 +10%↑
JRHC-2	50	2.0	23.4	3.5	Average	Heavy	M-4+20%↑
JRK 2013-2	50	2.0	23.8	3.6	Average	Heavy	M-4+20%↑
JRHC-1	40	2.0	24.2	3.5	Average	Heavy	M-4+40%↑
HC 583+	30	2.0	25.0	3.7	Average	Heavy	M-4 +55%↑
AMC 108+	40	2.0	17.6	3.1	Average	Heavy	M-4 +30%↑

+ Check variety

Barrackpore: Root content varied from 30 to 50 percent. Maximum defects were observed for all the samples. Tenacity values were average to fairly good in nature. Fineness varied from fine to very fine category. Fibre grades were M-4 and up.

NP(CB) 1.33: AVT-I with with kenaf

Centre wise performance of different kenaf entries in terms of fibre quality under this trial are presented in table 4.25.

Table 4.25: Fibre quality of entries under AVT-I with kenaf

Entry	Root content (%)	Defects (%)	Tenacity (gm/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore							
JRK 2011-2	30	2.0	22.5	3.0	Average	Heavy	M-4 +65%↑
JRK 2012-1	30	2.0	26.2	3.1	Average	Heavy	M-4+85%↑
JRK 2011-4	30	2.0	22.8	3.2	Average	Heavy	M-4 +65%↑
JRK 2011-1	30	2.0	23.0	3.1	Average	Heavy	M-4 +65%↑
HC 583+	50	2.0	17.8	3.2	Average	Heavy	M-4 +10%↑
AMC 108+	50	2.0	18.0	3.1	Average	Heavy	M-4 +10%↑

+ Check variety

Barrackpore: Hard root content varied from 30 to 50 percent. Maximum Defects were observed for all the samples. Fibre fineness was very fine. Tenacity value varied from average to fairly good in nature. Fibre grades were M-4 and up.

NP (SNH-B) 1.18: IET sunnhemp

Centre wise performance of different sunnhemp entries in terms of fibre quality under this trial are presented in table 4.26.

Table 4.26: Fibre quality of entries under IET with sunnhemp

Entry	Tenacity (gm/tex)		
	Kalyani	Barrackpore	Pratapgarh
Sanai-11	10.3	19.8	17.4
Sanai-14	11.7	21.2	21.5
JRS 2013-1	9.3	24.9	22.7
Sanai-13	11.6	18.1	18.4
Sanai-15	12.1	25.6	20.6
Sanai-12	12.4	17.0	19.4
SH 4+	11.1	22.4	22.1
SUIN 053+	13.9	24.1	19.2

+ Check variety

Kalyani: Tenacity value of samples showed very weak in nature.

Barrackpore: Tenacity value of samples was fairly good in nature.

Pratapgarh: Tenacity values of all the samples were fairly good in nature.

NP (SNH-B) 1.19: AVT-I sunnhemp

Centre wise performance of different sunnhemp entries in terms of fibre quality under this trial are presented in table 4.27.

Table 4.27: Fibre quality of entries under AVT-I with sunnhemp

Entry	Tenacity (gm/tex)		
	Kalyani	Barrackpore	Pratapgarh
Sanai-6	12.2	22.5	18.2
Sanai-10	13.2	18.7	19.6
Sanai-9	13.7	24.6	20.6
Sanai-7	13.4	21.8	18.5
SH 4+	11.8	25.2	16.2
SUIN 053+	14.2	26.3	17.3

+ Check variety

Kalyani: Tenacity value of samples showed very weak in nature.

Barrackpore: Tenacity value of samples was fairly good in nature except check variety SH 4.

Pratapgarh: Tenacity values of all the samples were fairly good in nature.

NP (SNH-B) 1.20: AVT-II with sunnhemp

Centre wise performance of different sunnhemp entries in terms of fibre quality under this trial are presented in table 4.28.

Table 4.28: Fibre quality of entries under AVT-II with sunnhemp

Entry	Tenacity (gm/tex)		
	Kalyani	Barrackpore	Pratapgarh
SUIN-5	10.6	19.4	19.1
SUIN-2	11.2	21.7	20.8
SUIN-4	11.3	23.4	19.6
SUIN-1	11.1	21.8	18.7
SUIN-3	11.2	19.7	18.4
K 12 Yellow+	9.8	20./2	19.1
SH 4+	11.0	19.5	21.3

+ Check variety

Kalyani: Tenacity value of all samples showed very weak in nature.

Barrackpore: Tenacity values of samples were fairly good in nature.

Pratapgarh: Tenacity values of all the entries were fairly good in nature.

Tribal Sub Plan (TSP)

In 2014-15, the Tribal Sub Plan programme had been taken up by AINP units of BCKV, UBKV, JRS Kendrapara and RARS, Nagaon. The activities were carried out in Alipurduar, Coochbehar and North 24 Parganas district of West Bengal, Keonjhar district of Odisha and Morigaon and Nagaon districts of Assam. The objective of the programme was to improve the socio-economic status of the tribal farmers through introduction of improved agriculture and allied activities in the tribal populated areas. In West Bengal, the programme was conducted in 20 villages of 24 Parganas (North), Alipurduar and Coochbehar districts involving 182 tribal farmers covering 50 ha area. Similarly in Assam, the programme was conducted in 20 ha area involving 100 tribal farmers belonging to four villages of Nagaon and Morigaon districts. The TSP activities were carried out in 15 ha area involving 56 tribal farmers of three villages of Keonjhar district of Odisha. The improved production technologies of both fibre and seed crop of jute as well as the improved microbial retting technology developed by ICAR-CRIJAF had been demonstrated to the farmers.

Jute field at Sri Krishnapur, West Bengal

BCKV: The programme was taken up in Srikrishnapur and Matiagachha under Nurpur Gram Panchayat in the Block Habra II, District 24 Parganas (North). A total of 82 tribal farmers – 40 from Srikrishnapur and 42 from Matiagachha villages were involved in the programme. Demonstration was given on line sowing with seed drill and improved microbial retting consortium developed by ICAR-CRIJAF (CRIJAF Sona) in 10 ha area. Line sowing in jute with CRIJAF Multi Row Seed Drill recorded 12% increase in fibre yield over broadcasting (22.86 q/ha). Use of CRIJAF Sona improved the fibre quality of jute and the farmers got about ₹ 500/- more per quintal over traditional retting (₹ 2640/q) and the retting duration was also reduced by 6-7 days. Nine field trainings on line sowing, integrated nutrient, weed and pest management, retting, etc. were imparted to 82 farmers.

Jute field at Matiagachha, West Bengal

UBKV: The TSP programme was taken up in collaboration with two NGOs [Tufanganj Anwesha Welfare Society (TWAS), Tufanganj, Cooch Behar and Satmile Satish Club-O-Pathagar (SSCOP), Dinhata, Cooch Behar] involving 182 small and marginal tribal farmers of Kumargram Block of Alipurduar district and Tufanganj II and Cooch Behar Sadar Block of Coochbehar district. Field demonstrations on improved fibre production in jute was conducted in 11 villages covering 35 ha area while seed production programme was conducted in 7 villages covering 5 ha area. About 50 quintal of certified seed was produced under TSP programme in 2013 and was procured by the NGO, "TAWS", out of which 85% was sold as certified seed at government

rate in the local market and the rest 15% of the seed was procured by AINPJAF, UBKV and utilized in the TSP programme of 2014. Two on-site monitoring and farmers training were conducted on 8-7-2014 and 14-11-2014. Two awareness training program titled 'Jute and jute seed production in North Bengal' and 'Jute production technology' were conducted at UBKV campus on 9-9-2014 and 17-11-2014, respectively and about 200 tribal farmers attended the programme. A technical bulletin titled "Integrated jute production technology" was published in Bengali by AINP unit of UBKV.

Line showing of jute at Coochbehar, West Bengal

JRS, Kendrapara: The TSP activities were taken up in three villages of Ghasipura and Anandapur blocks of Keonjhar district of Odisha. The programme was conducted over 15 ha involving 56 small and marginal tribal farmers of the district. At Sattatira village, field demonstrations were conducted on - chemical weed control (quizalofop ethyl 5% EC @ 1.5ml/ litre at 20-25 DAS), and improved microbial retting of jute using 'CRIJAF Sona'. Similarly at Deepapala and Beusahi, demonstrations were conducted on seed treatment with carbendazim (3g/kg seed), spraying of Carbendazim (0.1%) at 15 days interval for protection from stem rot and spraying of neem oil @ 3ml/litre of water at 30 and 45 DAS to minimize pest attack in jute. The average yield under TSP programme at Sattatira village was 8.4 q/ha more over yield with farmers practice (18.2 q/ha) and the net return was more by ₹ 17790/ha (Table 5.1). Similarly at Deepapala and Beusahi villages, the demonstration fields recorded yield increase by 11.0 q/ha over farmers' practice and the increase in net return was by ₹ 17080/ha (Table 5.2)

Farmers' training at UBKV, Coochbehar

Table 5.1 Fibre yield and economics of jute cultivation in farmers fields at Sattatira, Odisha

Treatments	Maximum yield (q/ha)	Average fibre yield (q/ha)	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B:C ratio
T_1	29.2	28.6	21,300	60,060	38,760	1.81
T_2	20.5	18.2	17,250	38,220	20,970	1.21

T_1 : chemical weed control (quizalofop ethyl 5% EC @ 1.5ml/litre at 20-25 DAS) & microbial retting under TSP; T_2 : Farmers' practice

Table 5.1 Fibre yield and economics of jute cultivation in farmers fields at Deepapala and Beusahi, Odisha

Treatments	Maximum yield (q/ha)	Average fibre yield (q/ha)	Cost of cultivation (₹/ha)	Gross return (₹/ha)	Net return (₹/ha)	B:C ratio
T_1	30.2	29.5	23,270	61,950	38,680	1.66
T_2	20.2	18.5	17,250	38,850	21,600	1.25

T_1 : seed treatment with carbendazim, spraying of Carbendazim (0.1%) at 15 days interval, spraying of neem oil @ 3ml/litre of water at 30 and 45 DAS under TSP; T_2 : Farmers' practice

Jute field at Sattatira, Odisha

Three trainings were given to 150 tribal farmers during 15th to 25th October, 2014 at Sattatira Deepapala and Beusahi villages on improved production technology, integrated pest management and improved microbial retting of jute.

RARS, Nagaon: The TSP programme was conducted at Dhupaguri Kacharigaon, and Sutirpar village of Nagaon district and Aphukhunda and Patidaya village of Morigaon districts covering 20 ha area and 100 tribal farmers were involved in the programme. The *olitorius* jute variety Tarun was grown with improved package of practices and the fibre yield in the demonstration fields under TSP programme ranged from 24 q/ha to 36 q/ha and were 20-25% higher than fibre yield under farmers' practice. Improved microbial retting of jute using 'CRIJAF Sona' was also demonstrated. The fibre strength of 'CRIJAF Sona' treated fibre increased by 2.0 – 3.5 g/tex at Sutirpar and Dhupaguri, Kacharigaon villages and by 1.6-3.2 g/tex at Aphukhunda and Patidaya villages over conventional retting method and also fetched Rs. 375 to 500 higher price per quintal of fibre. Four trainings were also conducted on improved production technology and improved microbial retting of jute and the trainings were attended by 200 farmers.

Farmers' training at Beusahi, Odisha

Microbial retting with CRIJAF Sona at Nagaon, Assam

11TH ANNUAL GROUP MEETING

The inaugural programme of the 11th Annual Group Meeting of AINPJAF started with ICAR theme song, followed by the lightening of lamp by Prof. S. K. Dutta, DDG (CS), ICAR, Dr. N. Gopalakrishnan, ADG (CC), ICAR, Dr. S. Satpathy, Director, CRIJAF, Dr. D. Nag, Director, NIRJAFT, Dr. K. Manoharan, Director, DJD, Prof. Debashis Majumdar, Director Research, UBKV and Dr. S. Mitra, In-Charge, AINP-JAF, CRIJAF.

The welcome address was delivered by Prof. Debashis Majumdar, Director of Research, UBKV, where he expressed his views on the critical bottlenecks of jute cultivation in our country and possible methods to mitigate them. He also pointed out the expectation of the farming community from the scientists in framing farmer friendly research policies and their proper execution.

Dr. S. Satpathy, Director, CRIJAF highlighted the significant research achievements of AINPJAF with special reference to north Bengal and north eastern states. He mentioned that development of high yielding varieties of jute like Tarun, JBO 1, etc. along with integrated nutrient, weed and pest management technologies had significantly increased the productivity of the crop. Moreover, the microbial retting had certainly improved the quality of the fibre as a result of which farmers are getting higher price of the fibre by about Rs. 300 to 400 per quintal. He also highlighted the role of TSP in the socio-economic development of the tribal communities and the role that AINPJAF has to play into it.

Dr. D. Nag, Director, NIRJAFT, highlighted the shortage of good quality fibre in the country, a major amount of which still has to be imported for the development of value added diversified products. He pointed out that in the context of diminishing water resources of our country particularly in the jute growing tracts, our research

should aim at developing improved retting technologies which can significantly cut down the water requirement and also result in good quality fibre, thereby reducing our expenditure on import of finer fibres of jute.

The AINPJAF Annual Report for the year 2013-14 was released by the chairman of the inaugural session Prof. S. K. Dutta. Altogether, three bulletins and three leaflets on jute and allied fibres were released by the dignitaries present on the dais.

Dr. K. Manoharan, Director, DJD, informed the house regarding the present status of jute cultivation in the country and insisted on smoother transfer of newer technologies to the jute growers. He opined that fluctuating market price is one of the major reasons for the decrease in area under jute cultivation and stressed upon the urgent need for appreciation of MSP for raw jute fibre.

Dr. N. Gopalakrishnan, ADG (CC), ICAR, addressed the august gathering by highlighting the contribution of the scientists of AINPJAF in solving the problems of jute cultivation with special reference to North Bengal situation. He highlighted the low cost and eco-friendly location specific technologies developed by the network project which had certainly increased the productivity and the profitability of jute and allied fibre farming as a whole. He also urged the scientists to explore newer areas of research which will further increase the importance of jute and allied fibre crops, both in national and international level.

Prof. S. K. Dutta, Deputy Director General (Crop Science), Indian Council of Agricultural Research, New Delhi chaired the inaugural session and complemented the AINP scientists for their significant achievements that had contributed in enhancing the productivity and quality of jute and allied fibres in the country. He also highlighted the recent developments in genomic research and emphasized on the intervention of genomic based science for augmenting productivity and fibre quality of jute and allied fibre crops. He further opined that centres should be more active on promoting the location specific low-cost technologies developed by the network project to bridge the yield gap among the jute and allied fibre growing states.

Dr. S. Mitra, In-Charge, AINP on JAF, CRIJAF, presented the comprehensive results of different experiments conducted during the last year under AINP on JAF, at different centres across the country. The session was concluded with vote of thanks from Dr. Ayan Roy, Asst. Prof., UBKV.

General Recommendations:

» The performance of centres on the basis of monitoring report, monthly progress report and reporting of results should be prepared and presented in the workshop.

» Trials must be conducted as per the technical programme of work of 2014 and the specific plot size for different trials should be maintained.

» Exhaustive crossing programme should be taken up by all the AINP centres.

» The fibre samples should be properly labeled with necessary information and should be sent to NIRJAFT by the centres by mid of November.

» More emphasis should be given on collection of jute and allied fibre germplasm. Collection should be done from southern part of the country also as previous collections have shown better fibre quality.

» GBPUAT, Pantnagar should be included as voluntary centre for conducting flax trials.

» Pooled analysis should be done when experiments had been repeated for two years or more and location specific recommendations should be made.

» Detail survey on weed must be done in farmers' fields in different jute and allied fibre growing states.

» The centres should improve in terms of quality of field experiments as well as publications.

Action Taken:

» The performance of the centres based on monthly progress reports as well as monitoring reports has been prepared and will be presented in the workshop.

» The trials had been conducted as per the technical programme.

» GBPUAT, Pantnagar has been included as voluntary centre for flax programme and trials have been conducted.

» Pooled analysis has been done in experiments conducted for two years or more and recommendations have been made.

» Weed survey had been conducted in different districts of West Bengal, Assam, Bihar, Odisha and reported accordingly.

Varieties identified:

Six varieties of jute and allied fibre crops, viz. JROG 1 of *olitorius* jute, JBMG 4 of kenaf, CRIJAF R-2 and CRIJAF R-8 of roselle, JRJ 610 of sunnhemp and JRF 2 of flax had been identified and recommended to the CSCSN&RV for release.

Publications

Research articles

Barman, D., Kundu, D. K., Ghorai, A. K. and Mitra, S. 2014. Determination of evapotranspiration and crop coefficient of *tossa* jute (*Corchorus olitorius*). *Journal of Agricultural Physics* 14 (1): 67-72.

Dudhane, A. S., Kumar, Vinay, Das, Bimal and Mukherjee, Subhra. 2013. Correlation and path analysis for fibre yield and component characters in tossa jute (*Corchorus olitorius* L.). *Journal of Interacademicia* 17 (3): 406-411.

Kumar, Mukesh, Ghorai, A.K., Majumdar, B., Mitra, S. and Kundu, D. K. 2015. Integration of stale seedbed with herbicides for weed control in jute (*Corchorus olitorius)* and their impact on soil microbes. *Journal of Agrisearch* (Accepted).

Meena, P. N., Gotyal, B. S., Roy, A., Mitra, S. and Satpathy, S. 2014. Ecofriendly management of major diseases in jute (*Corchorus olitorius*). *Journal of Applied and Natural Science* 6 (2): 541-544.

Pandey, S. K., Chaudhary, B., Kumar, S., Mitra, S. and Karmakar, P. G. 2014. Fibre quality amelioration and its assessment in raw jute. *Indian Journal of Natural Fibres* 1 (1): 119-124.

Ray, D. P., Satya, Pratik, Mitra, Sabyasachi, Banerjee, Pradipta and Ghosh, Rakesh Kumar. 2014. Degumming of ramie: challenge to queen of fibres. *International Journal of Bioresource Science* 1 (1): 37-42.

Ray, D. P., Banerjee, Pradipta, Satya, Pratik, Mitra, Sabyasachi, Ghosh, Rakesh Kumar and Mondal, Subhendu Bikash. 2014. Degumming of decorticated ramie fibre through novel chemical process. *Indian Journal of Natural Fibres* 1 (1): 125-129.

Singh, M.V., Kumar, Mukesh, Mitra, S. and Naik, Ramesh M. 2015. Nutrient management for jute-rice cropping system using soil test crop response equation. *Journal of Applied and Natural Science* (Accepted).

Subramanian, V. Ravi, Mitra, S. and Satpathy, S. 2014. Identifying sowing window, optimizing plant geometry and effect of topping on yield components and yield of mesta. *Indian Journal of Agronomy* (Accepted).

Sawarkar, Ashutosh, Yumnam, Sonika, Patil, S. G. and Mukherjee, S. 2014. Correlation and path coefficient analysis of yield and its attributing traits in tossa jute (*Corchorusolitorius*L.). *The Bioscan* 9 (2): 883-887.

Sawarkar, Ashutosh, Yumnam, Sonika, Mukherjee, Subhra, and Patil, S. G. 2015. Genetic divergence within some genotypes of *tossa* jute (*Corchorus olitorius* L.). *Environment and Ecology* 33 (2): 749-752.

Yumnam, Sonika, Sawarkar, Ashutosh, Mukherjee, Subhra and Sarkar, K. K. 2015. Genetic divergence studies on white jute under rainfed condition (*Corchorus capsularis* L.). *Environment and Ecology* 33 (3A): 1327-1329.

Book Chapter

Hazarika, D, Singha, K. D. and Zaman A. S. N. Occurrence of some edible mushroom in forest land of Assam. (*In*) Livelihood promotion through non timber forest products in India with special reference to NE India, Nath, Sanjit (Ed.), Dhing College, Nagaon, Assam, pp. 105-110.

Kumar, Mukesh, Singh, S. R., Jha, S. K., Majumdar, S. P., Singh, Amarpreet, Mitra, S., Kundu, D. K. and Mahapatra, B. S. 2014. Productivity, economics and energy analysis of jute based cropping system. (*In) Jute and allied fibres : Issues and strategies*. Nag, D., Ray, D. P., Ganguly, P. K., Kundu, D. K., Ammayappan, L., Roy, A. N., Satpathy, S., Satya, P., Mitra, S., Banik, S., Bose, G. and Nayak, L. K. (Ed) The Indian Natural Fibre Society, NIRJAFT, Kolkata, pp. 128-140.

Ray, D. P., Banerjee, Pradipta, Mondal, Subhendu Bikash, Satya, Pratik and Mitra Sabyasachi,. 2014. Degumming of ramie fibre through novel chemical process. (*In) Jute and allied fibres : Issues and strategies*. Nag, D., Ray, D. P., Ganguly, P. K., Kundu, D. K., Ammayappan, L., Roy, A. N., Satpathy, S., Satya, P., Mitra, S., Banik, S., Bose, G. and Nayak, L. K. (Ed) The Indian Natural Fibre Society, NIRJAFT, Kolkata, pp. 15-20.

Zaman, A S N, Hazarika, D, Singha, K. D and Phukan, E. A study on the physical and hydraulic properties of soils of Nambor Forest. (*In*) Livelihood promotion through non timber forest products in India with special reference to NE India, Nath, Sanjit (Ed.), Dhing College, Nagaon, Assam, pp. 152 -162.

Leaflet

Sarma, K. K., Borah, B. K., Das, P. K. and Guha, B. 2014.Marapatat Bisa Pukar Akraman Aru Niyantran Beyastha (Assamese). RARS, Shillongani, Nagaon, Assam.

Popular article

Karmakar, P. G., Satpathy, S., Kundu, D. K., Mitra, S**.**, Sarkar, S., Sarkar, S. K. and Pandey, S. K. 2014. Kendriya patsan ebong sambargiya resha anusandhan sangsthan ki pramukh uplabdhiya : ek drishti me (Hindi). *Resha Kiran* **1**: 1-6.

Sarma, K. K., Borah, B. K., Pathak, S. and Phukan, E. 2014. Status Report on Insect Pests in Central Brahmaputra Valley Zone of Assam. Directorate of Research (Agriculture), Assam Agricultural University, Jorhat.

Paper Abstracted

Hari Satyanarayana, N., Visalakshmi, V., Mukherjee, S., Bhanu Priya and Sarkar, K. K. 2015. Variability and character association in some roselle (*Hibiscus sabdariffa* L.) genotypes for fibre yield and attributes. (*In*) *Compendium of Abstracts*, The Second International Conference on Bio-Resource and Stress Management, Rajendranagar, Hyderabad, India, pp. 235.

Hari Satyanarayana, N., Visalakshmi, V., Mukherjee, S., Bhanu Priya and Sarkar, K. K. 2014. Characterization of roselle (*Hibiscus sabdariffa* L.) germplasm on the basis of some important morphological traits. (In) Invited Lectures and *Book of Abstracts*, International Conference on Natural Fibres (Theme: Jute and Allied Fibres), Kolkata, pp. 193.

Mukherjee, Subhra, HariSatyanarayana, N., Bhanu Priya and Bandhopadhyay, P. 2015. Genetic diversity and variability in white jute germplasm. (*In*) *Compendium of Abstracts*, The Second International Conference on Bio-Resource and Stress Management, Rajendranagar, Hyderabad, India, pp. 112.

Sawarkar, A., Yumnam, S. and Mukherjee, S. 2014. Evaluation of quantitative traits of tossa jute (*Corchorusolitorius* L.) based on principle component analysis. (In) Proceedings International Seminar on Integrating Agriculture & Allied Research: Prioritizing Future Potentials for Secure Livelihoods (ISIAAR), Kalyani, BCKV, pp.122.

Satyanarayana, N. H., Roy, S., Mukherjee, S., Priya, B. and Sarkar, K. K. 2014. Genetic divergence studies for fibre yield traits in Roselle (*Hibiscus sabdariffa* L.) in Terai zone of West Bengal. (In) Proceedings International Seminar on Integrating Agriculture & Allied Research: Prioritizing Future Potentials for Secure Livelihoods (ISIAAR), Kalyani, BCKV, pp.124.

Yumnam, Sonika, Sawarkar Ashuthosh, Mukherjee, S., Saha, Biplab, Das, Bimal and Sarkar, K. K. 2014. Identification of diverse genotypes in white jute (*Corchorus capsularis* L.) on the basis of morphological characters. (In) Invited Lectures and *Book of Abstracts*, International Conference on Natural Fibres (Theme: Jute and Allied Fibres), Kolkata, pp. 107.

Meteorological data of All India Network Project on Jute and Allied Fibres Centres during 2014

All India Network Project on Jute and Allied Fibres, ICAR-CRIJAF, Barrackpore, West Bengal

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Number of rainy days	Bright sunshine hours (hrs)	Evapo-ration (mm)	Wind velocity (km/ hrs)	Morning soil temperature (°C)			Afternoon soil temperature (°C)		
	Max.	Min.	Mor.	Noon						5 cm	15 cm	30 cm	5 cm	15 cm	30 cm
January	23.41	11.33	98.25	57.58	0.00	-	5.86	1.61	1.77	14.64	16.27	18.09	21.97	19.63	18.19
February	27.23	14.45	98.78	47.21	22.2	2	7.15	2.62	1.88	17.85	19.66	21.61	28.01	24.73	21.79
March	32.84	19.61	90.29	40.64	14.0	2	7.27	4.36	2.20	23.80	25.36	27.20	36.85	31.69	28.45
April	37.67	25.33	86.23	36.43	0.0	-	8.51	5.99	2.61	29.72	3175	33.65	41.45	37.89	33.89
May	36.89	26.54	85.87	52.96	88.0	7	7.86	7.0	4.49	30.13	31.65	33.75	45.36	37.56	33.99
June	33.98	26.65	90.33	70.1	316.4	12	4.01	4.23	3.38	29.57	30.13	31.53	3678	34.46	3172
July	31.72	26.46	94.19	80.89	324.8	16	2.45	2.32	2.33	28.60	28.98	29.90	32.84	31.61	30.07
August	32.22	26.08	95.25	76.03	297.4	14	3.45	2.82	2.71	28.20	28.82	29.81	33.18	31.55	29.94
September	32.34	25.88	94.36	74.1	184.0	10	4.88	2.78	1.74	27.75	28.55	29.68	33.19	31.57	29.90
October	31.49	23.09	93.54	66.51	64.8	4	6.0	2.77	1.41	25.25	26.31	28.08	31.75	29.72	28.36
November	29.69	16.42	93.16	44.1	0.0	-	6.85	2.08	0.80	19.37	21.14	23.96	28.01	25.22	24.15
December	25.27	12.40	96.67	52.67	0.0	-	5.58	1.59	1.53	15.07	17.13	20.01	23.96	20.95	20.11
Total					1311.6	77									

All India Network Project on Jute and Allied Fibres, BCKV, Mohanpur, Kalyani, West Bengal

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	No. of Rainy Days	Bright sunshine hours (hrs)	Eva-poration (mm)	Wind velocity (km/hrs)	Morning soil temperature (°C)			Afternoon soil temperature (°C)		
	Max.	Min.	Mor.	Noon						5 cm	15 cm	30 cm	5 cm	15 cm	30 cm
January	24.2	10.5	86	63	0.0	0	5.7	7.3	0	14.8	16.3	18.4	24.2	20.2	19.2
February	28.0	12.8	85	53	28.5	2	7.5	12.2	0	16.8	18.3	20.3	27.4	23.2	21.4
March	33.6	18.9	86	47	26.2	2	8	22.16	0.1	22.8	24.4	26.0	35.7	31.4	28.0
April	39.5	24.9	86	38	0.0	0	8.9	33.2	0.1	29.7	31.8	32.7	42.5	38.3	34.9
May	37.1	26.5	88	59	182.7	10	7.4	32.5	0.3	29.8	31.5	32.7	39.6	36.8	34.3
June	35.4	27.2	93	75	250.3	11	4.4	18.7	0.2	28.9	29.9	30.8	35.9	33.8	32.
July	32.8	27.0	96	84	237.1	15	3.6	15.2	0.1	28.3	29.1	29.8	33.2	31.9	30.7
August	34.1	26.5	95	78	343.2	16	4.7	16.0	0.1	28.0	28.9	29.7	34.2	32.5	30.9
September	34.2	25.9	94	77	281.7	13	6.5	16.5	0	27.4	28.4	29.3	34.1	32.3	30.6
October	33.8	23.5	88	69	81.9	6	7	14.9	0	25.4	26.6	27.8	32.4	30.3	28.9
November	32.1	16.1	81	52	0.0	0	7.3	10.9	0	19.8	21.4	23.3	28.2	25.1	24.1
December	26.5	12.0	86	58	0.0	0	5.4	7.4	0	15.9	17.4	19.5	23.8	20.6	20.2
Total					1431.6	75									

All India Network Project on Jute and Allied Fibres, RARS (AAU), Nagaon , Assam

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Number of rainy days
	Max	Min	I	II		
January	24.2	11.3	90	64	1.0	1
February	24	12.4	93	61	19.5	4
March	28.5	16.7	76	54	27.9	8
April	32.6	19.6	76	52	74.2	6
May	31.6	22.8	86	67	183.9	15
June	32.7	25.8	86	71	203.6	16
July	33.5	26.4	87	72	198.9	17
August	31.1	26	86	77	259.6	17
September	31.4	25.1	88	76	349.9	14
October	31.5	23.1	84	65	22.7	2
November	-	-	-	-	-	-
December	-	-	-	-	-	-
Total					1341.2	100

All India Network Project on Jute and Allied Fibres, UBKV, Coochbehar, West Bengal

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)
	Max.	Min.	Max.	Min.	
January	24.0	10.2	94	82	0.0
February	25.1	10.6	89	68	70.0
March	30.7	15.5	66	53	60.0
April	34.8	18.8	53	46	30.0
May	32.1	22.6	78	72	101.0
June	32.5	24.9	89	82	201.0
July	33.4	26.0	84	79	96.0
August	31.6	25.4	89	86	146.0
September	31.6	24.3	90	86	127.0
October	31.7	20.8	82	84	70.0
November	29.7	16.1	87	85	0.0
December	25.7	11.0	84	89	0.0
Total					901

All India Network Project on Jute and Allied Fibres, CRS (NDUAT), Bahraich, Uttar Pradesh

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)
	Max.	Min.	Max.	Min.	
January	15.00	11.00	85.00	76.00	0.0
February	21.00	12.00	78.00	52.00	0.0
March	32.00	17.00	70.00	46.00	0.0
April	37.00	26.00	60.00	30.00	0.0
May	41.00	28.00	55.00	34.00	0.0
June	45.00	29.00	53.00	27.00	0.0
July	40.00	27.00	84.00	78.00	550.0
August	38.00	26.00	90.00	74.00	600.0
September	33.00	24.00	92.00	80.00	120.0
October	32.00	23.00	76.00	63.00	40.0
November	28.00	15.00	70.00	58.00	0.0
December	26.00	13.00	64.00	54.00	0.0
Total					1310.0

All India Network Project on Jute and Allied Fibres, TRRI, Aduthurai , Tamil Nadu

Month	Temperature (°C)		Relative humidity (%)		Sunshine hours (hrs)	Rainfall (mm)	Number of rainy days
	Max.	Min.	Max.	Min.			
January	29.3	19.7	95	63	6.1	2.0	0
February	31.8	19.3	95	52	7.9	2.8	0
March	34.1	21.7	92	46	8.2	0.0	0
April	37.0	25.0	89	47	8.9	0.0	0
May	35.3	25.7	89	62	6.9	216.4	7
June	36.3	26.8	83	54	6.3	5.4	1
July	34.6	25.7	76	50	5.8	65.4	4
August	34.1	24.6	85	57	6.1	154.4	7
September	34.9	25.0	83	53	6.5	14.0	2
October	32.0	23.9	93	71	4.9	444.0	14
November	29.2	22.3	94	78	2.9	193.6	12
December	28.4	21.4	94	77	3.8	139.2	9
Total						1237.2	56

All India Network Project on Jute and Allied Fibres, MPKV, Rahuri, Maharashtra

Month	Temperature (°C)		Relative humidity (%)		Rainfall (mm)	Sunshine hours (hrs)	Evaporation (mm)	Wind velocity (km/hrs)
	Max.	Min.	Morning	Evening				
January	29.2	13.3	61.4	36.3	0	7.8	4.1	1.9
February	29.8	12.1	55.8	35.8	0	9.7	5.7	2.1
March	36.9	18.6	38.7	20.6	0	8.9	7.8	1.6
April	37.8	19.8	46.9	20.6	0	9.2	8.4	1.9
May	38.6	22.8	60.4	23.5	3.6	8.6	9.9	3.6
June	36.2	24.1	67.1	37.6	43.8	7.1	8.6	7.4
July	31.7	23.2	73.3	57.6	51.4	3.5	5.4	6.5
August	30.5	22.2	75.7	59.9	223.1	3.7	4.6	4.5
September	31.3	21.1	71.9	53.9	19.8	6.4	5.3	3.3
October	32.7	19.7	69.7	43.4	21.8	7.1	5.8	1.5
November	30.5	15.4	64.1	41.5	96.2	8.4	5.3	1.1
December	27.5	11.1	58.3	38.6	0	7.7	4.6	1.4
Total					459.7			

All India Network Project on Jute and Allied Fibres, ARS (ANGRAU), Amadalavalasa, Andhra Pradesh

Month	Temperature (°C)		Rainfall (mm)	Number of rainy days
	Max.	Min.		
January	30.3	17.9	-	-
February	32.4	18.5	-	-
March	35.8	23.1	4.2	1
April	37.4	26.6	-	-
May	36.7	27.6	180.0	5
June	36.4	28.4	109.2	6
July	32.1	26.9	298.9	16
August	33.2	27.1	260.9	15
September	32.5	26.4	291.1	15
October	32.5	24.9	556.0	6
November	31.9	20.3	12.2	1
December	29.2	16.5	11.0	2
Total			1723.5	67

All India Network Project on Jute and Allied Fibres, JRS (BAU), Katihar, Bihar

Month	Temperature (°C)		Rainfall (mm)
	Maximum	Minimum	
January	29.9	10.2	0
February	28.9	13.2	0.0
March	34.3	17.2	0.0
April	38.80	21.30	0.0
May	38.90	25.00	232.3
June	36.76	26.56	165.6
July	33.67	26.19	205.7
August	33.45	26.12	234.7
September	33.40	25.06	154.8
October	31.67	20.83	26.3
November	28.30	14.20	00.0
December	21.64	21.64	3.1
Total			1022.5

Financial Statement

Expenditure likely to be incurred by AINP centers during 2014-15

Name of center	Budget 2014-15 (₹ in lakhs)
1. All India Network Project on Jute & Allied Fibres, ICAR-CRIJAF, Barrackpore, West Bengal	37.30
2. Agricultural Research Station (ANGRAU), Amadalavalasa, Andhra Pradesh	45.20
3. Jute Research Station (OUAT), Kendrapara , Odisha	34.40
4. Crop Research Station, (NDUAT), Bahraich, Uttar Pradesh	32.40
5. Regional Agricultural Research Station (AAU), Nagaon, Assam	78.60
6. Jute Research Station (BAU), Katihar, Bihar	32.60
7. AINP on Jute & Allied Fibres, (BCKV), Mohanpur, Kalyani West Bengal	28.30
8. AINP on Jute & Allied Fibres, (UBKV), Pundibari, Coochbehar, West Bengal	18.20
9. AINP on Jute & Allied Fibres, TRRI, (TNAU), Aduthurai , Tamil Nadu	24.00
10. AINP on Jute & Allied Fibres, (MPKV), Rahuri, Maharashtra	14.00
Total	345.00

Staff Position (Scientific)

Name of AINP (J& AF) centres	Contact No.	e-mail ID
All India Network Project on Jute & Allied Fibres, CRIJAF, Barrackpore, W.B.		
Dr. S. Mitra, Pr. Scientist (Agronomy) & In-charge	+919831380471	ainpjaf@gmail.com mitrasaby@gmail.com
Dr. S.K.Pandey, Sr.Scientist (Breeding)	+919477447533	skpandey157@gmail.com
Centres		
1. Agricultural Research Station (ANGRAU), Amadalavalasa, Andhra Pradesh		
Dr. J. Jagannadham, Sr. Scientist (Soil Science) & I/C	+918008882991 +917893869144	jagannadham_ars@yahoo.com ars_adv@rediffmail.com
Dr. P. V. Padmavati, Scientist (Breeding)	+919704074492	padmaphd05@gmail.com
Smt B. Swathi, Scientist (Pathology).	+919966655282	swathib2004@gmail.com
Dr. Y. Rajasekhar, Scientist (Entomology)	+919490223244	yrsekhar2006@gmail.com
2. Jute Research Station (OUAT), Kendrapara, Odisha		
Dr. S. Panda, Assoc. Prof. (Breeding) & I/C	+919437165066	somanathpanda@yahoo.co.in
Dr. Srabani Debnath., Asst. Pathologist	+919046974928	srabanidebnath72@gmail.com
Dr. Sarika Jena, Asstt. Agronomist	+918763753714	sarika1407@gmail.com
Mr. Susanta Das, Asstt. Entomologist	+919439494071	susanta_dasmail@rediffmail.com
3. Jute Research Station (BAU), Katihar, Bihar		
Dr. M. Rahaman, Plant Breeder & I/C	+919431610280	dr.motiur51@gmail.com
Dr. M.K. Singh, Asstt. Entomologist	+919430557567	mukeshsingh73@gmail.com
Dr. Vinod Kr. Singh, Asstt. Breeder	+919955692649	vinod546@gmail.com
Dr. Laxman K., Asstt. Agronomist	+917033057539 +919431295536	konerulaki@gmail.com
Dr. Kunal Pratap Singh, Asstt. Pathologist	+918797142234	kunalpratapsingh53@gmail.com
4. Regional Agricultural Research Station (AAU), Nagaon, Assam		
Dr. P.K. Das, Pr. Scientist (Breeding) & I/C	+919435360832	drpkdas11@gmail.com
Dr. K.K. Sarma, Pr. Scientist (Entomology)	+919435165677	sarmamuk@yahoo.co.in
Dr. A.S.N. Zaman, Sr. Scientist (Soil Science)	+919435161721	abu_hot@rediffmasil.com

5.AINP on Jute & Allied Fibres, UBKV, Coochbehar, West Bengal		
Dr. S. Pal, Asstt. Prof. (Pathology & I/C	+919434216987	palsento@gmail.com
Dr. A. Kundu, Asstt. Prof. (Breeding)	+919433678323	kundu.avijit78@yahoo.com
Dr. Syhamal Kheroar, Asstt. Prof. (Agronomy)	+919474846416	kheroarshyamal@gmail.com
6. AIN P on Jute & Allied Fibres, BCKV, Kalyani, West Bengal		
Dr. S. Mukherjee, Assoc. Prof. (Breeding) & I/C	+919434168936	subhrabckv@rediffmail.com
Dr. P. Bandopadhyay, Prof. (Agronomy)	+919433133884	pintobckv@gmail.com
7. Crop Research Station (NDUAT), Bahraich, Uttar Pradesh		
Dr. M.V. Singh Sr. Agronomist & I/C	+919452760902	mvsinghbrh2013@gmail.com
Dr. R.B. Singh, Breeder	+919721256838	
Dr. K.L. Maurya, Asstt. Agronomist	+919451927937	
8. AINP on Jute & Allied Fibres, TRRI (TNAU), Aduthurai, Tamil Nadu		
Tmt. S. Santha, Asst. Prof. (Breeding)	+918754234229	santhatnau@gmail.com
Dr. E. Subramaniam, Asstt. Prof. (Agronomy	+919003428245	subbusel@rediffmail.com
9. AINP on Jute & Allied Fibres, MPKV, Rahuri, Maharashtra		
Dr. S.R. More, Asst. Breeder	+919822034191	moresopan@gmail.com cotton_mpkv@rediffmail.com

Address of Centres of AINP on Jute & Allied Fibres

SAU Based Regular Centres		Institute Based Centres	
1.	Regional Agricultural Research Station (AAU) Shillongoni, P.B.No.33, Nagaon-782 001, Assam	1	Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata 700 120
2	Agricultural Research Station (ANGRAU) Amadalavalasa 532 185, Dist. Srikakulam, Andhra Pradesh	2	Sisal Research Station Bamra 768 221, Dist. Sambalpur, Orissa
3	AINP on Jute & Allied Fibres (BCKV) B.C.K.V, Res.Building No.2 P.O. Krishi Viswavidyalaya 741 252, Dist. Nadia West Bengal	3	Sunnhemp Research Station Dist. Pratapgarh 230001, Uttar Pradesh
4	Jute Research Station (OUAT) Jajanga, P.O. Kapaleswar 754 211, Kendrapara, Odisha	4	Ramie Research Station P.O. Sorbhog 781 317,Dist. Barpeta, Assam,
5	Jute Research Station (BAU) P.O. Tingachhia 854 105, Katihar, Bihar	5	Central Seed Research Station for Jute & Allied Fibres P.O. Bud Bud, Dist. Burdwan 713403, West Bengal
6	AINP on Jute & Allied Fibres UBKV, Pundibari 736 165, Coochbehar, West Bengal	5	National Institute for Research Jute & Allied Fibres Technology 12, RegentPark, Tollygunge, Kolkata 700 040
7	AINP on Jute & Allied Fibres (MPKV) M.P.K.V, Rahuri 413 722 Dist. Ahmednagar, Maharashtra	6	NBPGR, Pusa Campus New Delhi
			Associated Organizations
8	Crop Research Station (NDUAT) P.O. & Dist. Bahraich 271801, Uttar Pradesh	1	Directorate of Jute Development Nizam Palace, Govt. of India, Deptt. of Agriculture, 234/4, A.J.C.Bose Road, Kolkata 700 020,
9	Tamil Nadu Rice Research Institute (TNAU), Aduthurai 612101, Tamil Nadu	2	Agriculture Department of Jute & Allied Fibre growing States