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ANNUAL REPORT

अखिल भारतीय पटसन एवं समवर्गीय रेशा नेटवर्क परियोजना
All India Network Project on Jute and Allied Fibres

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

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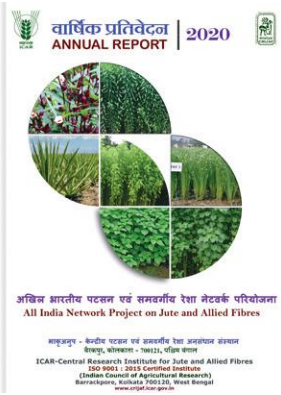

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Contents

PREFACE

Jute and allied fibre crops are versatile natural bast fibre yielding crops with considerable commercial, environmental and socio-economic importance having multifarious end users, mostly grown in the tropical and South East Asian countries. India is the single largest producer of jute goods in the world, contributing about 60% of the global production which has made impressive strides on the front of jute productivity. Limited availability of additional arable land and water resources, nutrient mining by exhaustive cropping systems will certainly throw a challenge to sustain the availability of natural fibres.

The All India Network Project on Jute and Allied Fibres (AINPJAF) 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. Considering the rising demand of high value jute diversified products, both in domestic and global markets, improvement in fibre quality should be our priority and we need to strengthen our breeding programme particularly in the direction of genetic manipulation of lignin biosynthesis for achieving improved fibre fineness in jute. Some of the recent measures of Government of India like compulsory Packaging Act, policy to ban 'single use plastics' and announcement of revised minimum support price of jute every year will definitely give a fillip to the development of jute sector. Multidisciplinary scientific teams under AINPJAF are dedicatedly working to develop technologies to improve raw jute and allied fibres productivity and their quality. Most of the viable technologies are being successfully demonstrated in farmers' fields through extension programme/electronic media, training of trainers and farmers under various schemes.

I express my sincere gratitude and thanks to Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR, New Delhi; Dr. T. R. Sharma, Deputy Director General (Crop Science) and Dr. R. K. Singh, Assistant Director General (Commercial Crops), ICAR, New Delhi for their constant encouragement and support. I also thank Dr. S. Mitra, Pr. Scientist & In-Charge, AINPJAF and his team for their support and contribution in successful compilation of this report. I acknowledge the efforts of the scientists of ICAR-CRIJAF, AINPJAF centres and other contributors for their commendable job to accomplish during this period reported upon.

Place: Barrackpore
Date: 8th February, 2021

(Gouranga Kar)
Director
ICAR-CRIJAF

Executive Summary

All India Network Project on Jute and Allied Fibres functions through 9 regular co-operating centres (8 SAU based centres and 1 ICAR Institute based centre, i.e. ICAR-NINFET) across 7 JAF growing states with its headquarter at ICAR-CRIJAF, Barrackpore, Kolkata. A total of 65 projects comprising of 252 trials were conducted on jute, mesta, sunnhemp, ramie, flax and sisal during 2020 under crop improvement, crop production and crop protection programme.

Crop Improvement

Under crop improvement programme, thirty-four projects comprising of 152 trials were conducted on jute and allied fibre crops in different centres.

Release and notification of JAF varieties

One variety each of *olitorius* jute i.e. JROMU 1 and kenaf variety JRHC 3 was recommended for release by the Central Sub-Committee on Crop Standard, Notification and Release of Varieties and has been notified vide Gazette notification no. S.O. 99(E) dated 6th January, 2020.

Three varieties of jute and allied fibre crops namely, JROB 2 of tossa jute, JRCJ 11 of white jute and AMV 10 of roselle identified in 31st Annual Workshop of AINPJAF held at OUAT, Bhubaneshwar, Odisha during 14-15th February, 2020 had also been recommended for central release by the Central Sub-Committee on Crop Standard, Notification and Release of Varieties in its 85th meeting held on 09th of November, 2020 and notified vide Gazette notification no. S.O. 500(E) dated 29th January, 2021.

Besides, one more variety of tossa jute i.e. NJ-7005 (Rani) has also been recommended for release and notification by the Central Sub-Committee on Crop Standard, Notification and Release of Varieties vide its minutes of 84th meeting held on 29.07.2020.

Evaluation of jute germplasm

Fifty accessions of *C. capsularis* jute were screened along with two check varieties for fibre yield and yield components in five locations. An overall mean of 14.3±2.6 g/plant was recorded for fibre yield over three locations with a range of 9.2 g/plant (CIN-142) to 20.7 g/plant (CIN-173). Four genotypes outperformed better check JRC 517 (17.5 g/plant) for fibre yield. Among the three locations, Coochbehar centre recorded highest mean performance for fibre yield (18.7±4.5 g/plant) and the entry CIN-172 recorded highest fibre yield (25.9 g/plant).

Fifty accessions of *C. olitorius* jute were screened along with two check varieties for fibre yield and yield components in six locations. Average fibre yield over the locations was recorded to be 16.3±1.6 g/plant with a range of 13.3 g/plant (OIN-176) to 16.5 g/plant (OIN-19.6). Five accessions outperformed better check JRO 524 (18.6 g/plant) for fibre yield. Among the six centres, Nagaon centre recorded highest mean fibre yield (23.9±3.9 g/plant) and accession OIN-177 recorded highest fibre yield (34.6 g/plant).

Evaluation of mesta germplasm

Fifty accessions of *Hibiscus sabdariffa* were evaluated for fibre yield and yield related traits at four locations with two check varieties. An overall mean of 8.9±0.9 g/plant was recorded for fibre yield with a range of 6.4 g/plant (RIN-64) to 10.6 g/plant (RIN-100). Five accessions outperformed better check AMV 5 (10.0 g/plant) for fibre yield. Among the three locations, Amadalavalasa centre recorded highest mean performance for fibre yield (10.8±0.7 g/plant) and the accession RIN-79 recorded highest fibre yield (12.1 g/plant) in this location.

Fifty accessions of *Hibiscus cannabinus* were also evaluated for fibre yield and yield related traits at three locations namely, Amadalavalasa, Aduthurai and Barrackpore with their two check varieties. An overall mean of 10.1±2.3 g/plant was recorded for fibre yield with a range of 6.4 g/plant (KIN-225) to 16.4 g/plant (KIN-224). Twenty-six genotypes outperformed better check AMC 108 (9.7 g/plant) for fibre yield. Among the two locations, Amadalavalasa centre recorded highest mean performance for fibre yield (12.5±4.4 g/plant) and the accession KIN-224 recorded highest fibre yield of 26.5 g/plant in this location.

National Hybridization Programme (NHP)

In tossa jute, F_7, F_6, F_5, F_4, F_3, and F_1 progenies of different cross combinations were evaluated at Kalyani, Kendrapara, Katihar, Coochbehar, Rahuri and Nagaon centre and promising lines have been identified and selected for further evaluation.

In white jute, F_5, F_4 and F_1 progenies of different cross combinations were evaluated at Kalyani, Coochbehar, Katihar, Nagaon and Kendrapara. Promising cross combinations at different centres have been identified for further evaluation.

A total of 6 F_1 hybrids of roselle were evaluated at Amadalavalasa centres. New crossing in roselle has also been attempted at Amadalavalasa and Barrackpore centres using promising roselle germplasm. In kenaf, a total 38 F_4 progenies were evaluated with two check varieties at Barrackpore and Aduthurai centres.

Yield evaluation trials

Tossa jute (*C. olitorius*)

IET: Test entry BROJ-2 recorded significantly high fibre yield (31.70 q/ha) over the best check JRO 204 (29.72 q/ha) followed by NJ-7068 (31.51 q/ha), UBOJ-1 (30.64 q/ha) and JROBA- 6 (30.29 q/ha).

AVT-I: Test entry JROP-4 (29.94 q/ha) recorded significantly high fibre yield than check variety JRO 204 (27.22 q/ha) followed by JROBA-5 (29.83 q/ha), NOJ-15-1 (27.10 q/ha), BCCO-20 (26.84 q/ha) and JRO-524 (26.27 q/ha).

AVT-II: Analysis of mean over locations and years suggested that test entry JROBA-4 recorded significantly high fibre yield (31.25 q/ha) over the best check JRO 204 (29.71 q/ha) followed by JROBA-3 (30.43 q/ha) and NOJ-7082 (29.97 q/ha).

White jute (*C. capsularis*)

IET: Eight test entries with 2 check varieties were evaluated at 5 locations. Test entry JRCP-9 (33.99 q/ha) recorded highest fibre yield followed by JRCP-8 (32.04 q/ha), NCJ-16-53-1 (31.76 q/ha) and check variety JRC 517 (30.79 q/ha).

AVT-I: Test entry JRCP-7 was found to be the high fibre yielder with 30.40 q/ha followed by best check JRC 517 (29.89 q/ha), BRCJ-5 (29.63 q/ha), JRCP-6 (29.56 q/ha), JRC 698 (29.29 q/ha) and BCCC-14 (27.05 q/ha).

AVT-II: Analysis of mean over locations and years recorded highly significant difference among entries. Test entry JRCP-5 recorded highest fibre yield (29.23 q/ha) followed by check variety JRC 517 (29.06 q/ha), BRCJ-1 (28.50 q/ha) and these entries were on par with best check.

Kenaf (*H. cannabinus*)

IET: Seven test entries with two check varieties were evaluated at 4 locations and test entry JRK-2019-3 (35.85 q/ha) significantly out yielded the best check variety AMC 108 (31.32 q/ha) for fibre yield.

AVT-I: Eight test entries with two checks were evaluated at 5 locations. Test entries JRK-2017-2 (29.09 q/ha) and JRK-2017-1 (28.87 q/ha) significantly out yielded the best check variety HC 583 (26.13 q/ha) for fibre yield.

AVT-II: Based on pooled analysis of data over locations and years, highly significant differences among entries were recorded. Check variety AMC 108 (27.26 q/ha) recorded highest fibre yield followed by test entries JRK-2016-5 (27.06 q/ha) and JRK-2016-2 (26.76 q/ha).

Roselle (*H. sabdariffa*)

IET: Five test entries with two check varieties were evaluated at 6 locations and test entry AD(RO)-17002 (39.85 q/ha) turned out to be the best performing entry for fibre yield followed by AHS-333 (28.70 q/ha) and check variety HS 4288 (26.63 q/ha).

AVT-I: Three test entries with two checks were evaluated at 6 locations. Test entry AHS-335 was the best performer with 24.29 q/ha fibre yield which was closely followed by check variety HS 4288 (23.56 q/ha).

AVT-II: Analysis of mean over locations and years revealed highly significant differences among entries. Test entries AHS-307 (23.59 q/ha) significantly out yielded the best check variety HS 4288 (22.33 q/ha) for fibre yield followed by AHS-309 (22.59 q/ha).

Sunnhemp (*C. juncea*)

IET: Four test entries with two checks were evaluated at four locations and test entry SUNC-13 (9.06 q/ha) out yielded the best check SUIN 53 (8.66 q/ha) for fibre yield which was closely followed by SUNC-12 (8.68 q/ha).

Flax (*L. usitatissimum*)

AVT-II: For dry fibre yield test entries JRF-16 (14.35 q/ha) and JRF-17 (14.03 q/ha) performed numerically better than check variety JRF 2 (13.45 q/ha) but were statistically at par for fibre yield potential.

Special trait trials

C. olitorius for leaf yield

AVT-II: Check variety JRO 204 recorded highest leaf yield (149.6 q/ha) followed by JROV-5 (149.3 q/ha) and JRO 524 (147.2 q/ha). Analysis of mean over locations and years revealed highly significant difference among entries.

H. sabdariffa for calyx yield

AVT-II: Four test entries with two checks were evaluated at three locations. Considering pooled analysis over years, test entries HSLC-1 (59.99 q/ha), HSLC-2 (54.45 q/ha) and AHC-1 (51.19 q/ha) significantly out yielded the best check HS 4288 (31.82 q/ha) for calyx yield.

Crop Production

During 2020 crop season, a total of 19 projects comprising of 60 trials were conducted under crop protection programme of which 26 trials were under jute, 10 trials were under mesta, 04 trials were under sunnhemp, 05 trials were under ramie, 08 trials were under sisal and 06 trials were under flax crop, respectively.

The targeted yield of jute under acid soil situation (4 t/ha) could not be achieved at Coochbehar, West Bengal even by increasing the fertilizer dose from 100% to 150% NPK on ST-TY approach with or without application of FYM and lime but the targeted yield of rice (5 t/ha) was achieved. At Nagaon, Assam, application of inorganic

fertilizer alone both at 100 and 150% ST-TY levels, could not achieve the targeted yield of jute (4.0 t/ha) whereas the same yield target was achieved when lime (@ 25% LR and organic manure @ 5 t/ha were integrated with soil test based fertilizer application both at 100 and 150% levels.

In mesta, the targeted yield of roselle (variety AMV 5) (3.2 t/ha) under neutral soil condition could be achieved with (-) 5.8% yield deviation only through combined application of inorganic fertilizers (based on soil test values) along with incorporation of FYM (@ 5 t/ha). This INM treatment also recorded significantly higher uptake of nitrogen (61.67 kg/ha), phosphorus (36.62 kg/ha) and potassium (56.97 kg/ha) by the crop at Aduthurai, Tamil Nadu. At Amadalavalasa, Andhra Pradesh, the targeted yield of kenaf (variety JBMP 2) (2.8 t/ha) under acid soil condition could be achieved with ± 10% deviation where fertilizer was applied as per soil test values either alone or in combination with lime and organic manure.

At Kalyani, West Bengal, maximum value of fibre yield (31.04 q/ha) of *tossa* jute were recorded with two hand weeding / mechanical weeding (15-20 & 35-40 DAE) treatment closely followed quizalofop ethyl 5 EC 60 g + ethoxysulfuron @ 100 g/ha at 15 DAE treatment (30.23 q/ha) while maximum net return (Rs. 59141/ha) was recorded with nail weeder + quizalofop ethyl (5% EC @ 60 g/ha) treatment in 2020 crop season. The pool data (2018-20) revealed that application of quizalofop ethyl 5% EC 60 g/ha + ethoxysulfuron 15 WDG @100 g/ha at 15 DAE (31.56 q/ha) or use of Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE (30.16 q/ha) recorded significantly higher fibre yield of jute and are recommended for south Bengal region. At Coochbehar, West Bengal, maximum fibre yield of jute (26.85 q/ha), minimum weed dry matter, maximum net return (Rs. 59174/ha) and B:C ratio (2.47) was recorded with quizalofop ethyl 5 % EC 60 g/ha + ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one hand weeding (HW) at 30 DAE treatment and also when the data was pooled (30.28 q/ha) and is recommended for the region. Considering the higher fibre yield (pool data) of jute as well as higher net return (Rs. 59174/ha recorded over other other weed control treatments, application of Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW at 30 DAE is recommended for weed control in jute in north Bengal region. At Nagaon, Assam, maximum fibre yield (23.86 q/ha) was recorded with quizalofop ethyl 5% EC @ 60 g/ha + ethoxysulfuron @ 100 g/ha at 15 DAE treatment which was statistically at par with fibre yield recorded with pretilachlor 50% EC @ 900 g/ha + one HW at 15 DAE (22.44 q/ha) and quizalofop ethyl 10% EC @ 38 g/ha + one HW at 15 DAE (22.81 q/ha) treatments. In 2020, maximum fibre yield (29.72 q/ha) and weed control efficiency (WCE) (78.3%) were recorded with pretilachlor 50% EC @ 900 ml/ + one HW at 15 DAE treatment at Kendrapara, Odisha and the treatment also recorded comparatively higher net return. Considering both the higher fibre yield of jute (pool data of 2018-2020) (27.33 – 27.44) as well as higher net return (Rs. 61134 - 62898/ha) recorded with Nail Weeder + quizalofop ethyl 5%EC @ 60 g at 25 DAE or application of pretilichlor 50% EC 900 g/ha at 45-48 hours of sowing with irrigation + one HW (15 DAE) are recommended for weed control in jute at Kendrapara, Odisha region. At Rahuri, Maharashtra, maximum seed yield (16.70 q/ha) of *tossa* jute was recorded with application of quizalofop ethyl 5% EC 60 g/ha + ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW at 30 DAE treatment which was at par with quizalofop ethyl 5 EC 60 g + ethoxysulfuron @ 100g/ha at 15 DAE (16.22 q/ha) and propaquizafop 10 EC @ 90 g/ha at 15 DAE + one HW at 30 DAE (15.16 q/ha) treatments, respectively. Maximum gross return (Rs. 100191/ha) and net return (Rs. 56821/ha) was also recorded with application of quizalofop ethyl 5 EC 60 g + ethoxysulfuron @ 50 g/ha at 15 DAE + one HW treatment. The pool analysis (2018-2020) also recorded maximum seed yield (16.33 q/ha) of *tossa* jute was recorded with application of quizalofop ethyl 5% EC 60 g/ha + ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW at 30 DAE and is recommended for the Rahuri, Maharashtra region.

At Amadalavalasa, Andhra Pradesh, application of quizalofop ethyl 5% EC @ 60g + ethoxysulfuron @ 50 g/ha at 15 DAE + one HW at 30 DAE recorded highest fibre yield (13.83 q/ha) of mesta along with lower weed dry biomass and higher weed control efficiency (74.7%). At Aduthurai, Tamil Nadu, application of pretilachlor @

900 g/ha at 45-48 hrs of sowing with irrigation + one HW at 15 DAE recorded highest fibre yield (27.32 q/ha), minimum weed dry matter (0.28 - 0.76 q/ha), maximum weed control efficiency (50.09 – 76.34%) along with highest gross return (Rs. 109280/ha), net return (Rs. 77830/ha) and B:C ratio (3.47) in mesta.

Intercropping of brinjal on soil columns within jute gunny bags in the transplanted paddy field in 4:1 and 8:1 row ratio recorded higher rice equivalent yield (131.91 & 134.43 q/ha), gross return (Rs. 145105 & 147870/ha), net return (Rs. 87955 & 91920/ha) and B:C ratio (2.54 & 2.64) at Cooch Behar, West Bengal. Growing of ridge gourd in jute gunny bags in inter-row space of transplanted paddy field recorded higher system paddy equivalent yield (68.40 q/ha), gross return (Rs. 123120/ha), net return (Rs. 74120/ha) compared to sole paddy (40.00 q/ha, Rs. 72000/ha & 32000/ha, respectively) at Kendrapara, Odisha.

At Amadalavalasa, Andhra Pradesh, highest mesta equivalent yield (48.34 q/ha) was recorded with sole maize closely followed by mesta + maize (2:1) intercropping system (47.36 q/ha) and mesta + sunnhemp (3:4) (32.82 q/ha). Among the intercropping systems tested, maximum gross return (Rs. 132740/ha) and net return (Rs. 80624/ha) was recorded with mesta + maize (2:1) intercropping followed by mesta + sunnhemp (3:4) (Rs. 91976/ha & Rs. 70310/ha) at Amadalavalasa. At Aduthurai, Tamil Nadu, highest mesta equivalent yield (45.96 q/ha), gross return (Rs. 128412/ha) and net return (Rs. 98212/ha) was recorded with mesta + rice (3:4) intercropping system followed by mesta + groundnut (3:4) intercropping system (41.02 q/ha, Rs. 114966/ha & Rs. 81956/ha).

The study on carbon dynamics and hydro-physical characterization of soils in jute and mesta growing areas revealed that the organic carbon contents of the soils were medium to high. In Assam, the soil organic carbon (SOC) contents of Hojai district of Assam ranged in between 0.87-0.99% with highest value at at Kathiatoli. The SOC contents of mesta growing areas of Andhra Pradesh ranged in between 0.38-0.58% with highest and lowest values recorded at Balijipeta and Goluguvalasa, respectively. The SOC content of Nagapattinam districts, Tamil Nadu varied in between 0.51 and 0.86 %, lowest being in Sirkazhi and highest being in Nakkambadi. The bulk SOC contents of experimental farm, MPKV, Rahuri ranged in between 0.47 to 0.72 %. The SOC contents among the various locations of Pattamundai and Kendrapara blocks, Odisha ranged in between 0.54-0.73%, highest being at Chaudakutala, Kendrapara block, Odisha.

Integrated nutrient management (75% RDN + 25% N through FYM + 5 kg $MgSO_4$) in seed crop of *tossa* jute recorded maximum seed yield (17.09 q/ha) of the crop along with maximum gross return (Rs. 102580/ha) and net return (Rs. 57270/ha) at Rahuri, Maharashtra.

The interaction of organic matter with inorganic fertilizer doses revealed that F_4M_3 (NPK @ 80: 17.5: 33.3 kg/ha + FYM @ 5 t/ha + lime @ 25% LR) and F_5M_3 (NPK @ 80: 26: 50 kg/ha + FYM @ 5 t/ha + lime @ 25% LR) treatments were at par and recorded significantly higher seed yield (17.14 – 17.58 q/ha) of mesta at Amadalavalasa in 2020. Similar trend was observed in seed yield of mesta (12.16 – 12.93 q/ha) when data was pooled for three years (2018-2020). Hence application of NPK @ 80: 17.5: 33.3 kg/ha + FYM @ 5 t/ha + lime @ 25% LR is recommended for seed production in mesta at Amadalavalasa region of Andhra Pradesh.

Maximum value of pods/plant (37.2), seeds/pod (199) and 1000 seed weight (2.18 g) and seed yield (2.35 q/ha) of *tossa* jute were recorded with two hand weeding treatment which statistically at par with application of pretilachlor 0.9 kg/ha as pre-emergence+ one hand weeding or with post-emergence application of quizalofop ethyl 10 EC 38 g + ethoxysulfuron @ 135 g/ha at 15 DAE) at Coochbehar, West Bengal. The pooled data (2018 – 2020) revealed that significantly higher seed yield of tossa jute was recorded with flat bed sowing (3.21 q/ha) and with two hand weeding (3.23 q/ha) at Coochbehar, West Bengal and is recommended for jute seed cultivation in the region.

In 2019-20 crop season, maximum seed yield of sunnhemp was recorded with 15th September sowing (21.80 q/ha) which was statistically at par with seed yield recorded on 30th September (20.00 q/ha) at Kalyani, West

Bengal. Maximum seed yield was recorded with SUIN 053 (19.11 q/ha) and was in the order of SUIN 053 > SUIN 037 > JRJ 610. At Amadalavalasa, Andhra Pradesh, Maximum seed yield (23.78 q/ha) of sunnhemp was recorded with 30th September which was significantly higher than seed yield observed in other sowing dates. JRJ 610 recorded significantly higher seed yield of sunnhemp (24.85 q/ha)

Maximum plant height (105.8 cm), basal diameter (0.41 cm), green weight (192.01 q/ha), dry weight (54.43 q/ha) and fibre yield (18.05 q/ha) of flax was recorded with sowing on 1st week of November and it decreased progressively with delay in the sowing time at Coochbehar, West Bengal.

At Barrackpore, West Bengal, intercropping of flax + spinach (2:1) recorded highest system flax fibre equivalent yield (25.31 q/ha) followed by sole flax crop (19.70 q/ha) while at Coochbehar, West Bengal, maximum fibre equivalent yield of flax was recorded with flax + garden pea (2:1) (16.45 q/ha) followed by flax + grass pea (2:1) (15.90 q/ha) and flax + lentil (2:1) (15.23 q/ha). At Nagaon, Assam, seed yield of flax was maximum with sole flax crop (12.91 q/ha) which was statistically at par with flax + lentil (12.20 q/ha).

At Barrackpore, West Bengal, the ramie crop planted on ridge and furrow system recorded highest fibre yield (16.26 – 16.35 q/ha) when it received 150% of recommended dose of N and 25% of the fertilizer N was substituted by ramie compost or FYM. Similarly, the total fibre yield (total of 3 cuttings) of ramie recorded with 150% recommended dose of N (RDN) (6.50 q/ha) was statistically at par with the yield recorded with INM treatments comprising of 25% of the N from FYM / ramie compost (6.88 & 7.12 q/ha) at Coochbehar, West Bengal. At Sorbhog, Assam, maximum value of total fibre yield (16.14 q/ha) of ramie was recorded with 100% RDN. The combination of N @ 75 kg/ha/cut and K @ 50 kg/ha/cut recorded significantly higher fibre yield of ramie (16.40 q/ha) at Barrackpore, West Bengal.

Application of inorganic NPK @ 60:13:50 kg/ha or NPK @ 90:13:50 kg/ha along with vermi-compost @ 2.5 t/ha recorded higher value of leaves/plant (37.6 - 38.0), green leaf biomass (590.16 - 597.16 q/ha) and fibre yield of sisal (19.58 - 19.81 q/ha) over application of inorganic NPK @ 120:13:50 kg/ha at Amadalavalasa, Andhra Pradesh.

Crop Protection

Survey and surveillance of insect pests and diseases of jute were conducted in all the AINP centers except Barrackpore and Katihar centres due Covid-19 lockdown. The yellow mite infestation was maximum with infestation of 1.73, 12.00, 17.64, 6.27 mite populations/cm^2 leaf area on 2nd unfolded leaf at Nagaon, Kendrapara, and Coochbehar, respectively coinciding at 35 DAS to 45 DAS during last week of May to end-June. Maximum infestation of Bihar hairy caterpillar was noticed at Nagaon, Coochbehar and Kendrapara with infestation of 26.33, 15.56 and 28.22% during June-August at 65-85 DAS. The maximum semilooper damage at Nagaon was 9.72% followed by Coochbehar and Kendrapara with infestation of 12.63% 27.91%, respectively. Infestation of mealybug (5.83 %) was specific to Nagaon. At Amadalavalasa, in mesta maximum infestation of aphids, whiteflies and leafhoppers were 10.82, 1.80 and 0.72/plants. The infestation of semilooper and mealybug was 51.33 % and 77.00% at 45 DAS and 77 at 55 DAS, respectively.

Stem rot, root rot, anthracnose and mosaic diseases were common in jute. The infestation of leaf mosaic of white jute was very specific to Kendrapara center with incidence of 9.41 % during 85 DAS. The maximum incidence of stem rot was observed from mid-June to September with 8.34 %, (PDI) 32.96 (PDI), and 15.59 %, at Nagaon, Coochbehar and Kendrapara respectively during 85 to 120 DAS. The incidence of root rot disease was maximum 11.37%, 29.22 %, and 16.99% at Nagaon, Coochbehar and Kendrapara.

At Nagaon, the plant damage by Bihar hairy caterpillar was maximum in OIN-174 (31.18 %) followed by OIN-159 (29.75 %). Lower infestation was observed in OIN-153 (12.33 %), OIN-139 (12.82%), OIN-136 (12.95%),

OIN-138 (15.37 %). Entry OIN-153 (3.57%), OIN-172 (5.15%), OIN-151 (5.71%), OIN-145 (5.97%) and OIN-167 (5.93%) recorded lower semilooper infestation. The lower mite population was recorded on OIN-138, OIN-142, OIN-148, OIN-149, OIN-172, OIN-178 as 0.75, 0.58, 0.33, 0.58, 0.58, and 0.67 no/sq.cm of second unfolded leaf respectively. In Coochbehar, negligible infestation of insect pests and mite was observed in *capsularis* germplasm. The entries of germplasm *viz*. OIN-149 and OIN-181 were found to be completely immune against yellow mite infestation. Among the *capsularis* accessions, significantly higher yellow mite incidence (no./sq. cm of 2nd unfold leaf) was recorded in JRC-698, JRC-517, CIN-160, CIN-175 & CIN-185 and lower mite population was noticed in CIN-149, CIN-167 & CIN-148. Bihar hairy caterpillar infestation ranged from 2.13% (CIN-171) to 17.96% (JRC-698). In Kendrapara, the insect pest which attacked the the *tossa* jute were yellow mite, stem weevil & semilooper. Range of yellow mite infestation was 2 to 13.62. The minimum infestation of mite was found in OIN-138 (2%) and maximum infestation was found in JRO-524 (13.62%). Stem weevil infestation ranged from 1.11 % to 7.21%.

In Katihar, the infestation of yellow mite ranged from (5.63-27.45) number/cm^2, lowest infestation observed in OIN-152, OIN-162, OIN-159, OIN-143 (5.63, 6.89, 8.37, 8.65, 7.00) mite/cm^2. The infestation of BHC (4.87-30.47%), semilooper infestation (12.52-32.25%) and stem weevil infestation (0.68-6.35%) were observed.

In Nagaon, entry OIN-141 was free from root rot infestation. Lower root rot infestation was observed on OIN-145 (0.90%), OIN-151 (0.83%), OIN-157 (2.37%), OIN-166 (2.21%), OIN-174 (2.48%), OIN-175 (2.34%) and OIN-180 (2.27%). PDI for stem rot was lower for OIN-138 (0.75), OIN-142 (0.58), OIN-148 (0.33), OIN-149 (0.58), OIN-172 (0.58) and OIN-178 (0.67). Both root and stem rot diseases, were prevalent among *capsularis* gremplasm. PDI for stem rot was lower for CIN-162 (0.33), CIN-165 (0.92), CIN-138 (1.75), CIN-140 (1.50), CIN-143 (1.58), CIN-148 (1.67), CIN-154 (1.83) and CIN-159 (1.75). In Coochbehar, lowest incidence of root rot was observed in accessions namely OIN-142(6.23%), OIN-147(5.34), OIN-149(8.23%), OIN-164(9.67%), OIN-168(7.34%), OIN-174(8.87%), OIN-181(8.98%) and OIN-184(9.35%). Highest root rot was observed in OIN-167(20.98%), OIN-150(20.97%), OIN-164(20.36%) and OIN-153(20.23%). Less root rot was observed in CIN-148, CIN-152, CIN-154, CIN-171, CIN-172, CIN-173and CIN-178. In Katihar, the highest stem rot disease incidence was recorded 4.91 % in OIN-178 followed by 4.17 % in OIN-177 in comparison to nil in check variety, JR0-204. Total 38 lines showed immune reaction to stem rot and 41 lines to stem rot disease incidence under field condition. In Kendrapara, the germplasm free from stem rot disease are OIN-158, OIN-160 and OIN-168. The lowest PDI (1.08) was recorded in germplasm OIN-173., whereas highest PDI (18.11) was recorded in JRO-524, which indicates that germplasm OIN-173 is resistant to stem rot and JRO-524 is highly susceptible to stem rot.

In Katihar, the population of leafhopper (per/plant) ranged from 1.32 – 4.68 at 45 DAS; 2.49 – 7.58 at 52 DAS and 3.25 – 8.12 at 59 DAS. In case of white flies population (per/plant) ranged from 0.46 – 4.86 at 45 DAS; 1.34 – 8.34 at 52 DAS and 2.85 – 9.16 at 59 DAS. In Amadalavalasa, the *Hibiscus sabdariffa* (roselle) germplasm screened against insect pests, aphid incidence was low in all the entries and ranging from 0.00 to 10.56 aphids per plant with highest incidence recorded in RIN-64 entry. Incidence of whitefly was completely absent in RIN-66 and RIN-100. leafhopper population was completely absent in RIN-71 entry as against higher population of 0.92 leafhoppers per plant recorded in RIN-96 entry.

In Katihar, the incidence of foot and stem rot was very low and varied from nil to 4.62%. The highest percentage of diseases was recorded in germplasm line KIN-185 followed by KIN-208. Total 26 lines were not infected with foot and stem rot.

In Nagaon, the seed treatment with carbendazim 50WP and azoxystrobin 25% SC recorded lower wilt incidence. Plant height and green weight for the two treatments were significantly higher than the control treatment. In

Pratapgarh, the seed treatment with thiram 80 WP @ and carbendazim 50 WP @ 2 g/ kg seed recorded highest fibre yield (11.55 q/ha) and lowest wilt incidence (5.33 %) over control (10.28 q/ha).

In Katihar, among the treatment NSKE 5% at 35 DAS+ Azadirachtin (1500ppm) @ 5ml/L at 50 DAS+ *Verticillium lecani* @ 6g/L at 65 DAS., was found superior over all treatment followed by Profenophos @ 2 ml/L at 35, 50 and 65 DAS (standard check) in managing the sucking pests.

In Barrackpore, at 30 DAS and 50 DAS line sowing methodology harbored less mite population (14.41 mites/ cm^2 and 13.08 mites/cm^2). There was no significant difference between the planting methodologies evaluated for integrated management of stem rot disease in jute. There was significant difference between the treatments and planting methodologies evaluated for yield parameter with P_1 Line sowing (5-6 lakhs/ha), T_1 Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS being the best combination in getting maximum yield (28.17 q/ha).

In Barrackpore, stem rot were recorded before harvest. Only treatments revealed significant effect on stem rot incidence. Both T_1 (Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 (PDI 2.54) and T2=Seed treatment with *Thricoderma* @ 10 g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/l at 15 DAS + spraying of Azadirachtin (10000 ppm) @ 3 ml/l at 35 and 55 DAS (PDI 3.27) showed significantly lower stem rot incidence than that of control, T_3 (PDI 4.78). In Nagaon, stem rot incidence was at par in treatment T_1 and treatment T_2. Fibre yield was significantly higher in T_1 (27.48 q/ha) and T_2 (25.89 q/ha) than that of the control, T_3 (21 q/ha). But, fibre yield of T_1 was significantly higher than T_2.

In Barrackpore, the stem rot record was low in all the entries including susceptible check JRC 412. Among the entries, PDI of stem rot was highest (5.66) in JRC 412. It was followed by JRO 524 with 2.33 and JRO 204 with 1.76. All other genotypes from both olitorius and capsularis types showed low PDI (0.6 – 1.21) of stem rot. In Nagaon, OIN-07 recorded significantly higher stem rot incidence than that of OIN-21, OIN027, OIN-154 and OIN-651. Rest of the entries was at par. Entries OIN-154, OIN-21, OIN-27 and OIN-651 recorded lower stem rot incidence. In Kendrapara, the lowest PDI of 4.00, 4.33, 4.51 and 4.59 were recorded in OIN-21,OIN-125,OIN-07 and OIN-154 line.

In Nagaon, the higher plant infestation of 24.00 per cent and 22.67 per cent was recorded on entries OIN-11 and OIN-14 respectively during 40 day old crop. Minimum plant infestation (10 per cent) was recorded in OIN-67. Though fibre yield was at par among the 13 entries, entry no. OIN-67, OIN- 21 and OIN-53 recorded apparently higher fibre yield of 28.72 q/ha. 28.16 q/ha and 28.14 q/ha respectively. In Katihar, the infestation started to appear from 30 DAS and continued up to 50 DAS. Yellow mite population /sq.cm were observed maximum in JRO 2407, OIN 61, OIN 67, and OIJ 08 (10.81, 7.60, 6.93, 6.31) at 30 DAS and minimum yellow mite population /sq.cm were observed in germplasms OIN 10, OIN 34 (2.58, 2.46) at 30 DAS. At 40 DAS, yellow mite population /sq.cm were observed maximum in JRO 2407, OIN 61 (21.13 & 9.78) and minimum yellow mite population / sq.cm were observed in germplasms OIN 14, OIN 16 (5.22 & 6.09). In Kendrapara, the minimum plant infestation was recorded in OIN-53 (2.33%) and OIN-34 (2.67%) at 70 DAS. Highest fibre yield (26.33q/ha) was recorded in OIN-34 and lowest fibre yield (19.73q/ha) was recorded in OIN-10.

At Coochbehar, out of 16 genotypes of jute screened, none were found immune or resistant against *M. incognita* (Pundibari isolate race-5). Five genotypes (OIN-05, OIN-13, OIN-154 & OIN-853) were found as moderately resistant with few galls and eggs in the root system. Five entries (JRC-321, OIN-651 & OIN-125) were highly susceptible and six were susceptible in reaction.

Tribal Sub Plan

The Tribal Sub Plan programme during 2020 crop season had been taken up by AINPJAF centres of BCKV, Kalyani; UBKV, Coochbehar and RARS, Nagaon. The TSP programme had been conducted in 6 villages (Srikrishnapur, Badalgir, Atialdanga, Jagirbalabari and Kalmati of West Bengal and Mazgaon Jajori of Assam) belonging to three (03) districts (North 24 Parganas and Coochbehar districts of West Bengal and Nagaon district of Assam) covering 19.12 ha area and involving 89 tribal farmers. Under this programme field demonstrations were conducted on farmers' participatory mode on new varieties of jute (JRO 204 & JBO-2003-H), line sowing using CRIJAF Multi Row Seed Drill, integrated weed management using CRIJAF Nail Weeder, IPM and improved retting using CRIJAF SONA in farmers' fields. In south Bengal, the activities were carried out in in 1.79 ha area involving 19 tribal farmers of North 24 Parganas whereas in north Bengal, the activities were carried out in 12.0 ha area of Cooch Behar district involving 35 tribal farmers. In Assam, 35 tribal farmers belonging to Nagaon district were involved in the programme and 5.33 ha area was covered under demonstration of improved technologies of jute and allied fibre crops. Field demonstrations on new varieties, improved production technologies comprising of line sowing using CRIJAF Multi-Row Seed Drill, integrated nutrient management, integrated weed management using CRIJAF Nail Weeder, IPM modules for jute and improved microbial retting using microbial consortium CRIJAF SONA were conducted in farmers' fields under farmers' participatory mode.

The demonstrations on improved varieties like JBO-2003-H and JRO 204 recorded additional fibre yield of 1.5 - 3.0 q/ha and additional profit of Rs. 6300/ha to Rs. 12675/ha over existing variety JRO 524 (26 q/ha & Rs. 34850/-) in West Bengal while at Assam, variety Tarun recorded 6.25 q/ha more yield and about Rs. 25000/ ha more profit over JRO 524 variety (22.83 q/ha & Rs. 16457/ha). The demonstration on line sowing using CRIJAF Multi Row Seed Drill has recorded additional yield of 5.0 q/ha and additional net return of Rs. 27125/ ha over broadcasting (22.0 q/ha & Rs. 12950/ha) in north Bengal while integrated weed management in tossa jute recorded additional fibre yield of 4.0 q/ha and net return of Rs, 26900/ha, respectively. Demonstration of integrated weed management using CRIJAF Nail Weeder recorded yield benefit of 4.83 q/ha in *tossa* jute along with additional net return of Rs. 24807/ha over hand weeding (23.95 q/ha & Rs. 10689/ha) in Assam.

कार्यकारी सारांश

पटसन एवं समवर्गीय रेशा पर अखिल भारतीय नेटवर्क परियोजना, इन फसलों को उगाये जाने वाले 8 राज्यों मे कुल 9 नियमित सह-संचालन केंद्रों (8 राज्य कृषि विश्वविद्यालय तथा 1 आइसीएआर संस्थान आधारित केंद्र) के माध्यम से अपने मुख्यालय बैरकपुर, कोलकाता से कार्यरत है। वर्ष 2020 के दौरान फसल सुधार, फसल उत्पादन तथा फसल सुरक्षा कार्यक्रम के तहत पटसन, मेस्ता, सनई, रेमी, फ्लैक्स तथा सीसल पर 65 परियोजनाओं के अन्तर्गत कुल 252 परीक्षण किए गए।

फसल सुधार

फसल सुधार कार्यक्रम के तहत पटसन एवं समवर्गीय रेशा फसलों पर विभिन्न केंद्रों में चौंतीस परियोजनाओं के अन्तर्गत कुल 152 परीक्षण संचालित किए गये।

पटसन एवं समवर्गीय रेशा किस्मों का विमोचन एवं अधिसूचना

भारत सरकार के अधीन फसल मानकों, किस्मों का विमोचन एवं अधिसूचना संबंधी केन्द्रीय उपसमिति के सिफ़ारिश पर तोषा पटसन की जेआरओएमयू 1 तथा केनाफ की जेआरएचसी-3 किस्में विमोचित की गयी हैं जिसकी अधिसूचना भारत राजपत्र संख्या 99 (ई), दिनांक 6 जनवरी, 2020 के तहत जारी किया गया है।

14-15 फरवरी, 2020 के दौरान ओयूएटी, भुवनेश्वर, ओडिशा में आयोजित एआईएनपीजेएएफ के 31वें वार्षिक कार्यशाला में चिन्हित पटसन एवं समवर्गीय रेशा फसलों की तीन किस्में, जैसे तोषा पटसन की जेआरओबी 2, सादा पटसन की जेआरसीजे 11 तथा रोजेल की एएमवी 10 के विमोचन की सिफ़ारिश फसल मानक, अधिसूचना तथा किस्मों के विमोचन हेतु केन्द्रीय उपसमिति की दिनांक 09 नवंबर, 2020 को सम्पन्न 85वीं बैठक में की गई थी जिसकी अधिसूचना भारत राजपत्र संख्या 500 (ई), दिनांक 29 जनवरी, 2021 के माध्यम से जारी की गयी है।

इसके अतिरिक्त तोषा पटसन की एनजे-7005 (रानी) किस्म की भी समीक्षा केंद्रीय उपसमिति की दिनांक 29 जुलाई 2020 को आयोजित 84वीं बैठक में की गयी तथा इसे भी विमोचित एवं अधिसूचीत करने की सिफारिस की गई है।

पटसन जननद्रव्यों का मूल्यांकन

रेशा उपज तथा उपज घटकों के लिए पांच स्थानों में *कैपसुलरिस* पटसन के 50 जननद्रव्यों तथा दो चेक प्रजातियों की परीक्षण की गई। तीन स्थानों पर 9.2 ग्रा./पौध (सीआइएन-142) से 20.7 ग्रा./पौध (सीआइएन-173) के अन्तराल में समग्र औसत रेशा उपज 14.3±2.6 ग्रा./पौध दर्ज की गयी। रेशा उपज के संदर्भ में 4 जननद्रव्य, चेक प्रजाति जेआरसी 517 (17.5 ग्रा./पौध) से बेहतर प्रदर्शन किए। तीन स्थानों में से कूचबिहार केन्द्र में उच्चतम औसत रेशा उपज (18.7±4.5 ग्रा./पौध) तथा वंशक्रम सीआईएन-172 की उच्चतम रेशा उपज (25.9 ग्रा./पौध) दर्ज की गई।

सी. ओलिटोरियस पटसन के भी 50 वंशक्रमों की जांच उनकी 2 चेक किस्मों के साथ रेशा उपज, पौधे की ऊंचाई, आधारीय ब्यास तथा हरित जैवभार के लिए छह स्थानों में की गई। सभी स्थानों पर 13.3 ग्रा./पौध (ओआईएन-176) से 16.5 ग्रा./पौध (ओआईएन-19.6) के अन्तराल में समग्र औसत रेशा उपज 16.3±1.6 ग्रा./पौध दर्ज की गई। रेशा उपज के संदर्भ में पांच वंशक्रम उत्कृष्ट चेक प्रजाति जेआरओ 524 (18.6 ग्रा./पौध) से बेहतर प्रदर्शन किए। छह केंद्रों में, नागाँव केंद्र ने उच्चतम औसत रेशा उपज (23.9±3.9 ग्रा./पौध) तथा वंशक्रम ओआईएन-177 ने उच्चतम रेशा उपज (34.6 ग्रा./पौध) दर्ज कराया।

मेस्ता जननद्रव्यों का मूल्यांकन

रेशा उपज तथा इससे संबंधित लक्षणों के लिए दो चेक किस्मों के साथ रोजेल के 50 वंशक्रमों का मूल्यांकन चार स्थानों पर किया गया। तीन स्थानों पर 8.9±0.9 ग्रा./पौध समग्र औसत रेशा उपज के साथ न्यूनतम 6.4 ग्रा./पौध (आरआईएन-64) से अधिकतम 10.6 ग्रा./पौध (आरआईएन-100) रेशा

उपज दर्ज किया गया। रेशा उपज के लिए पांच जननद्रव्यों ने चेक प्रजाति एएमवी 5 (10.0 ग्राम / संयंत्र) की तुलना में बेहतर प्रदर्शन किए। तीनों स्थानों में से आमादालावालसा केन्द्र में उच्चतम औसत रेशा उपज (10.8±0.7 ग्रा./पौध) तथा इसी केंद्र पर वंशक्रम आरआईएन-79 में उच्चतम रेशा उपज (12.1 ग्रा./पौध) दर्ज की गयी।

रेशा उपज और उपज संबंधी गुणों के मूल्यांकन के लिए तीन स्थानों जैसे कि आमादालावालसा, आदुथूरई तथा बैरकपुर में केनाफ के 50 जननद्रव्यों की जांच दो चेक किस्मों के साथ की गई। दो स्थानों पर 6.4 ग्रा./पौध (केआईएन-225) से 16.4 ग्रा./पौध (केआईएन-224) के अन्तराल में 10.1±2.3 ग्रा./पौध समग्र औसत रेशा उपज दर्ज किया गया। रेशा उपज के लिए 26 प्रभेदों को श्रेष्ठ चेक प्रजाति एएमसी 108 (9.7 ग्रा./पौध) की तुलना में बेहतर पाया गया। दोनों स्थानों में से आमादालावालसा केन्द्र में उच्चतम औसत रेशा उपज (12.5±4.4 ग्रा./पौध) तथा इसी केंद्र पर उच्चतम रेशा उपज (26.5 ग्रा./पौध) वंशक्रम केआईएन-224 ने दर्ज कराया।

राष्ट्रीय संकरण कार्यक्रम (एनएचपी)

कल्याणी, केंद्रपाड़ा, कटिहार, कूचबिहार, राहुरी तथा नगांव केन्द्रों में तोषा पटसन की विभिन्न संकर संयोजनों के एफ$_7$, एफ$_6$, एफ$_5$, एफ$_4$, एफ$_3$ तथा एफ$_1$ संततियों का मूल्यांकन किया गया और आशाजनक प्रभेदों की पहचान कर आगामी मूल्यांकन हेतु चयन किया गया।

कल्याणी, कूचबिहार, कटिहार, नगांव तथा केंद्रपाड़ा में सफेद पटसन के विभिन्न संकर संयोजनों के एफ$_5$, एफ$_4$, तथा एफ$_1$ संततियों का मूल्यांकन किया गया। इन सभी केन्द्रों पर आशाजनक संकर संयोजनों की आगामी मूल्यांकन हेतु पहचान तथा चयन की गई है।

आमादालावालसा केन्द्र में रोजेल के कुल 6 एफ$_1$ संकरों का मूल्यांकन किया गया। रोजेल में आमादालावालसा तथा बैरकपुर केंद्रों में आशाजनक वंशक्रमों के उपयोग से नया संकरण कार्य भी किया गया है। बैरकपुर और आदुथूरई केंद्रों पर केनाफ में कुल 38 एफ4 संततियों का मूल्यांकन उनके 2 चेक किस्मों के साथ किया गया है।

उपज मूल्यांकन परीक्षण

तोषा पटसन (*सी. ओलिटोरियस*)

आईईटी: जांच प्रविष्टि बीआरओजे-2 ने 31.70 कु०/हे. रेशा उपज के साथ चेक प्रजाति जेआरओ 204 (29.72 कु०/हे.) की तुलना में सांख्यिकीय रूप से उत्कृष्ट प्रदर्शन किया जिसके बाद क्रमशः एनजे-7068 (31.51 कु०/हे.), यूबीओजे-1 (30.64 कु०/हे.) तथा जेआरओबीए-6 (30.29 कु०/हे.) का स्थान रहा।

एवीटी-I: जांच प्रविष्टि जेआरओपी-4 की रेशा उपज (29.94 कु०/हे.) चेक किस्म जेआरओ 204 (27.22 कु०/हे.) की तुलना में सांख्यिकीय रूप से उत्कृष्ट पायी गयी जिसके बाद क्रमशः जेआरओबीए-5 (29.83 कु०/हे.), एनओजे-15-1 (27.10 कु०/हे.) तथा बीसीसीओ-20 (26.84 कु०/हे.) का स्थान रहा।

एवीटी-II: स्थानों तथा वर्षों के औसत विश्लेषण के आधार पर जांच प्रविष्टि जेआरओबीए-4 की रेशा उपज (31.25 कु०/हे.) श्रेष्ठ चेक जेआरओ 204 (29.71 कु०/हे.) की तुलना में उत्कृष्ट पायी गयी जिसके बाद क्रमशः जेआरओबीए-3 (30.43 कु०/हे.) तथा एनजे-7082 (29.97 कु०/हे.) का स्थान रहा।

सादा पटसन (*सी. कैपसुलरिस*)

आईईटी: जांच प्रविष्टि जेआरसीपी-9 (33.99 कु०/हे.) के बाद जेआरसीपी-8 (32.04 कु०/हे.), एनसीजे-16-53-1 (31.76 कु०/हे.) तथा चेक किस्म जेआरसी 517 (30.79 कु०/हे.) ने क्रमशः उच्च रेशा उपज दर्ज कराये।

एवीटी-I: जांच प्रविष्टि जेआरसीपी-7 में सर्वाधिक 30.40 कु०/हे. रेशा उपज दर्ज किया गया, जिसके बाद उत्कृष्ट चेक प्रजाति जेआरसी 517 (29.89 कु०/हे.) का स्थान रहा।

एवीटी-II: स्थानों और वर्षों के औसत विश्लेषण में जांच प्रविष्टि जेआरसीपी-5 की सर्वाधिक रेशा उपज (29.23 कु०/हे.) दर्ज की गई जिसके बाद चेक प्रजाति जेआरसी 517 (29.06 कु०/हे.) का स्थान रहा।

केनाफ (*एच. कन्नाबीनस*)

आईईटी: जांच प्रविष्टि जेआरके-2019-3 (35.85 कु०/हे.) की रेशा उपज सांख्यिकी तौर पर उत्कृष्ठ चेक किस्म एएएमसी 108 (31.32 q / ha) से बेहतर पायी गयी।

एवीटी-I: जांच प्रविष्टियाँ जेआरके-2017-2 (29.09 कु०/हे.) तथा जेआरके-2017-1 (28.87 कु०/हे.) की रेशा उपज के दृष्टिकोण से चेक किस्म एचसी 583 (26.13 कु०/हे.) की तुलना में बेहतर पायी गयी।

एवीटी-II: स्थानों और वर्षों के समेकित विश्लेषण में जांच प्रविष्टियां जेआरके-2016-5 (27.66 कु०/हे.) की सर्वाधिक रेशा उपज दर्ज की गयी जिसके बाद चेक प्रजाति एएमसी 108 (27.60 कु०/हे.) का स्थान रहा।

रोजेल (*एच. सबडरिफ्फा*)

आईईटी: जांच प्रविष्टि एडी(आरओ)-17002 (39.85 कु०/हे.) को रेशा उपज के लिए सर्वश्रेष्ठ पाया गया जिसके बाद क्रमशः एएचएस-333 (28.70 कु०/हे.) तथा चेक एचएस 4288 (26.63 कु०/हे.) का स्थान रहा।

एवीटी-I: जांच प्रविष्टि एएचएस-335 ने 24.29 कु०/हे. रेशा उपज के साथ सर्वश्रेष्ठ प्रदर्शन किया जिसके बाद चेक किस्म एचएस 4288 (23.56 कु०/हे.) का स्थान रहा

एवीटी-II: स्थानों और वर्षों के औसत विश्लेषण में जांच प्रविष्टि एएचएस-307 (23.59 कु०/हे.) की रेशा उपज चेक किस्म एचएस 4288 (22.33 कु०/हे.) की तुलना में सांख्यिकी रूप उत्कृष्ठ पायी गयी।

सनई (*सी. जंसिया*)

आईईटी: जांच प्रविष्टि एसयूएनसी-13 (9.06 कु०/हे.) की रेशा उपज श्रेष्ठ चेक एसयूआइएन 53 (8.66 कु०/हे.) से बेहतर पायी गयी, जिसके बाद एसयूएनसी-12 (8.68 कु०/हे.) का स्थान रहा।

फ्लैक्स (*एल. उसीटाटीसीमम*)

एवीटी-II: शुष्क रेशा उपज के दृष्टिकोण से जांच प्रविष्टि जेआरएफ-16 (14.35 कु०/हे.) तथा जेआरएफ-17 (14.03 कु०/हे.) ने संख्यात्मक रूप से चेक प्रजाति JRF 2 (13.45 कु०/हे.) की तुलना में बेहतर किन्तु सांख्यिकीय तौर पर समतुल्य थे।

विशेष गुणों से संबंधित परीक्षण

तोषा पटसन की पत्तीयुक्त शाक-भाजी उपज

एवीटी-II: चेक किस्म जेआरओ 204 ने 149.6 कु०/हे. उच्चतम पत्ती उपज के साथ सवश्रेष्ठ प्रदर्शन किया जिसके बाद क्रमशः जेआरओवी-5 (149.3 कु०/हे.) तथा जेआरओ 524 (147.2 कु०/हे.) का स्थान रहा।

रोजेल की बाह्यदलपुंज/कैलिक्स उपज

एवीटी-II: स्थानों और वर्षों के औसत विश्लेषण में जांच प्रविष्टियाँ एचएसएलसी-1 (59.99 कु०/हे.), एचएसएलसी-2 (54.45 कु०/हे.) तथा एएचसी-1 (51.19 कु०/हे.) ने उत्कृष्ठ चेक एचएस 4288 (31.82 कु०/हे.) की तुलना मे बेहतर कैलिक्स उपज दर्ज कराये।

फसल उत्पादन

वर्ष 2020 के फसल अवधि के दौरान, 60 परीक्षणों से युक्त कुल 19 परियोजनाएँ फसल उत्पादन कार्यक्रम के तहत आयोजित की गई। इनमें से 26 परीक्षण पटसन के तहत, 10 परीक्षण मेस्ता, 4 परीक्षण सनई, 05 परीक्षण रेमी, 08 परीक्षण सीसल एवं 06 परीक्षण फ्लैक्स के थे।

पश्चिम बंगाल के कूचबिहार में, अम्लीय मृदा स्थिति के तहत, पटसन की लक्षित उपज (4 टन/हे.) एसटी-वाई(ST-TY) आधार के बावजूद एन.पी.के. उर्वरक की खुराक की मात्रा एफ वाई एम के साथ या उसके बिना 100% से 150% तक बढाने पर भी प्राप्त नहीं की जा सकी। लेकिन इसी को धान में प्रयोग करने पर लक्षित उपज (5 टन / हे.) प्राप्त हुई। असम के नागांव में अकार्बनिक उर्वरक का प्रयोग अकेले 100% और 150% ST-TY दोनों स्तरों पर करने पर भी पटसन की लक्षित उपज (4.0 टन/हे.) प्राप्त नहीं की जा सकी। जबकि इसी लक्ष्य की उपज मिट्टी परीक्षण आधारित उर्वरक के साथ चूना का (@ 25% LR) एवं जैविक खाद @ 5 टन / हे. को 100% और 150% के स्तरों पर एकीकृत करने से संभव हुआ।

उदासीन मिट्टी में रोजेल (एएमवी 5) की लक्षित उपज (3.2 टन/हे.) (-)5.8% उपज विचलन के साथ, मिट्टी परीक्षण के आधार पर, अकार्बनिक उर्वरकों और एफ वाई एम केवल (5 टन/हे.) के संयोजन से प्राप्त हो सका। इस एकीकृत पोषण प्रबंधन से तमिलनाडु के अदुथुराई में फसल द्वारा नाइट्रोजन (61.67 किग्रा/हे.), फास्फोरस (36.62 किग्रा/हे.) और पोटेशियम (56.97 किग्रा/हे.) अवशोषण में सार्थक वृद्धि देखि गयी। आंध्र प्रदेश के आमादालावालसा में अम्लीय मिट्टी में, मिट्टी परीक्षण के आधार पर, चूने और जैविक खाद के संयोजन से केनाफ (JBMP 2) की लक्षित उपज (2.8 टन/हे.) 10% उपज विचलन के साथ प्राप्त की जा सकी।

पश्चिम बंगाल के कल्याणी में तोषा पटसन की अधिकतम रेशा उपज (31.04 कु०/हे.) हाथ की दो निराई / यांत्रिक निराई (15-20 और 35-40 डीएई) से दर्ज की गयी। इसके बाद वर्ष 2020 में रेशा उपज (30.23 कु०/हे.) की प्राप्ति, 15 डीएई, के बाद क्विज़ालोफ इथाइल 5 EC 60 ग्राम + एथोक्सीसल्फ्यूरॉन @ 100 ग्रा/हे. का प्रयोग करने से हुई। जबकि वर्ष 2020 में ही अधिकतम शुद्ध लाभ (रु 59141/हे.) नेल वीडर + क्विजालोफ इथाइल (5% EC @ 60 ग्रा/हे.) के प्रयोग से हुआ। संग्रहित आंकड़ों (2018-20) से पता चला कि क्विज़ालोफ़ॉप इथाइल 5% EC 60 ग्रा/हे. + एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 100 ग्रा/हे. के प्रयोग से 31.56 कु०/हे. रेशा उपज या नेल वीडर 5 DAE + क्विज़ालोफ़ॉप इथाइल 5% EC 60 ग्रा/हे. के 25 DAE प्रयोग से 30.16 कु०/हे. रेशा उपज की सार्थक प्राप्ति हुई जो कि दक्षिण बंगाल क्षेत्रों के लिए अनुशंसित है।

पश्चिम बंगाल के कूचबिहार में पटसन की फसल में क्विजालोफोप इथाइल 5% ईसी 60 ग्रा / हे. + अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 50 ग्रा./हे.+ अंकुरण के 30 दिन बाद हाथ की एक निराई उपचार से अधिकतम रेशा उपज (26.85 कु०/हे.), न्यूनतम खरपतवार शुष्क पदार्थ, अधिकतम शुद्ध लाभ (रु 59174 / हे) और लाभ : लागत अनुपात (2.47) दर्ज किया गया था। ऐसा ही संग्रहित आंकड़ों (30.28 कु०/हे.) के आधार पर देखा गया। ये संस्तुति इस क्षेत्र के लिए अनुशंसित है।

पटसन की अधिकतम रेशा उपज (संग्रहित आँकड़ा) और अधिकतम शुद्ध लाभ के आधार पर, उत्तर बंगाल के क्षेत्रों में खरपतवार नियंत्रण के अन्य उपचारों कि तुलना में क्विजालोफोप इथाइल 5% ईसी 60 ग्रा / हे. + एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 50 ग्रा / हे. के प्रयोग (15 DAE) + अंकुरण के 30 दिन बाद हाथ की एक निराई की अनुशंसा की जाती है। असम के नागांव में अधिकतम रेशा उपज (23.86 कु०/हे.) क्विजालोफोप इथाइल 5% ईसी 60 ग्रा / हे. + एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 100 ग्रा / हे. (15 DAE) से प्राप्त की गई। जो सांख्यिकीय रूप से फ़ाइबिलाक्लोर 50% EC @ 900 ग्रा / हे. + अंकुरण के 15 दिन बाद हाथ की एक निराई (22.44 कु०/हे.) और क्विज़ालोफ़ॉप इथाइल 10% EC @ 38 ग्रा / हे. + अंकुरण के 15 दिन बाद हाथ की एक निराई (22.81 कु०/हे.) के उपचार के बराबर थी।

ओडिशा के केंद्रपाड़ा में वर्ष 2020 में, प्रेटिलाक्लोर 50% ईसी @ 900 मिली/ लीटर + अंकुरण के 15 दिन बाद हाथ की एक निराई से अधिकतम रेशा उपज (29.72 कु०/हे.) की प्राप्ति हुई, खरपतवार नियंत्रण दक्षता (डब्ल्यूसीई) (78.3%) तथा तुलनात्मक रूप से इस उपचार में अधिकतम शुद्ध लाभ दर्ज किया गया। ओडिशा के केंद्रपाड़ा में पटसन खरपतवार प्रबंधन हेतु वर्ष 2018-2020 के संग्रहित आँकड़ों के अधिकतम रेशा उपज (27.33 - 27.44 कु०/हे.) तथा अधिकतम शुद्ध लाभ के आधार पर नेल वीडर + अंकुरण के 25 दिन बाद क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.या सिंचित अवस्था में बुवाई के 45-48 घंटा बाद प्रेटिलाक्लोर 50% ईसी 900 ग्रा/ हे. + अंकुरण के 15 दिन बाद हाथ की एक निराई वाली उपचार की सिफारिश की जाती है।

महाराष्ट्र के राहुरी में तोषा पटसन बीज की अधिकतम उपज (16.70 कु०/हे.) क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.+ अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 100 ग्रा./हे. + अंकुरण के 30 दिन बाद हाथ की एक निराई वाली उपचार से दर्ज की गई। जो क्रमशः क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.+ अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 100 ग्रा./हे. से (16.22 कु०/हे.) प्राप्त हुई तथा अंकुरण

के 15 दिन बाद क्विज़ालोफ़ॉप इथाइल 10% EC @ 90 ग्रा./हे.+ अंकुरण के 30 दिन बाद हाथ की एक निराई वाली उपचार (15.16 कु०/हे.) के समतुल्य था। क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.+ अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 50 ग्रा./हे.+ हाथ की एक निराई वाली उपचार से अधिकतम सकल लाभ (100191 रु/हे.) के साथ-साथ शुद्ध लाभ (56821 रु/हे.) दर्ज किया गया। तोषा पटसन बीज के संग्रहित आँकड़ों (2018-2020) के आधार पर सर्वाधिक उपज (16.33 कु०/हे.) क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.+ अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 50 ग्रा./हे.+ अंकुरण के 30 दिन बाद हाथ की एक निराई से प्राप्त हुई, जो कि महाराष्ट्र के राहुरी क्षेत्र के लिए अनुशंसित है।

आंध्र प्रदेश के आमादालावालसा में मेस्ता फसल में क्विज़ालोफ़ॉप इथाइल 5% EC @ 60 ग्रा./हे.+ अंकुरण के 15 दिन बाद एथोक्सीसल्फ्यूरॉन 15 डब्लूडीजी @ 50 ग्रा./हे.+ अंकुरण के 30 दिन बाद हाथ की एक निराई द्वारा न्यूनतम खरपतवार शुष्क बायोमास तथा अधिकतम खरपतवार नियंत्रण दक्षता (74.7%) के साथ अधिकतम रेशा उपज (13.83 कु०/हे.) की प्राप्ति हुई। तमिलनाडु के आदुथूरई में, मेस्ता फसल में सिंचित अवस्था में बुवाई के 45-48 घंटा बाद प्रेटलाक्लोर @ 900 ग्रा./हे. + अंकुरण के 15 दिन बाद हाथ की एक निराई से न्यूनतम खरपतवार शुष्क बायोमास (0.28 - 0.76 कु०) तथा अधिकतम खरपतवार नियंत्रण दक्षता (50.09 - 76.34%) के साथ-साथ अधिकतम रेशा उपज की प्राप्त हुई। इस उपचार से मेस्ता में अधिकतम सकल लाभ (109280 रु/हे.) तथा लाभ : लागत अनुपात (3.47) दर्ज की गयी।

पश्चिम बंगाल के कूचबिहार में रोपाई वाले धान के खेत में पटसन बोरे से सुदृढ़ मृदा स्तम्भ पर बैंगन की अंतर्वर्ती खेती करने से 4:1 और 8:1 पंक्ति अनुपात करने पर धान समतुल्य उपज (131.91 और 134.43 कु०/हे.), सकल लाभ(145105 और 147870 रु./हे.), शुद्ध लाभ (87955 और 91920 रु/हे) तथा लाभ : लागत अनुपात (2.54 और 2.64) की प्राप्ति हुई। ओडिशा के केंद्रपाड़ा में रोपाई वाले धान के खेत में पटसन बोरे से सुदृढ़ मृदा स्तम्भ पर झींगनी की अंतर्वर्ती खेती करने से धान समतुल्य उपज (68.40 कु०/हे.), सकल लाभ(123120 रु./हे.), तथा शुद्ध लाभ (74120 रु./हे.) की प्राप्ति हुई। जबकि केवल धान की खेती करने पर धान समतुल्य उपज (40.00 कु०/हे.), सकल लाभ(72000 रु / हेक्टेयर) तथा शुद्ध लाभ (32000 रु./हे.) की प्राप्ति हुई।

आंध्र प्रदेश के आमादालावालसा में सर्वाधिक समतुल्य उपज शुद्ध मक्का की खेती (48.34 कु०/हे.) के बाद मेस्ता एवं मक्का (2:1) की अंत: खेती (47.36 कु०/हे.)तथा मेस्ता +सनई (3;4) की अंत: खेती (32.82 कु०/हे.) द्वारा दर्ज की गई। इसी तरीके से मेस्ता +मक्का (2:1) की अंत: खेती से सर्वाधिक सकल लाभ (1,32,740 रु./हे.) तथा शुद्ध लाभ (80,624 रु./हे.) के बाद मेस्ता + सनई (3:4) से सकल लाभ (91,976 रू०/है.) तथा शुद्ध लाभ (70,310 रु./हे.) की प्राप्ति हुई। तमिलनाडु के आदुथूरई में सब से अधिक मेस्ता समतुल्य उपज (45.96 कु०/हे.), सकल लाभ (1,28,412 रु./हे.) तथा शुद्ध लाभ (98,212 रु./हे.) मेस्ता + धान (3:4) की अंत: खेती से हुई। इसके बाद मेस्ता +मूँगफली (3:4) द्वारा समतुल्य उपज (41.02 कु०/हे.), सकल लाभ (1,14,966 रु./हे.) तथा शुद्ध लाभ (81,956 रु./हे.) की प्राप्ति हुई।

पटसन एवं मेस्ता उत्पादन क्षेत्रों में कार्बन गतिशीलता और जलीय-भौतिक लक्षणों के अध्ययन से मिट्टी में मध्यम से उच्च स्तर के जैविक कार्बन सामग्री का पता चला। असम के होजोई जिला के कथातोली में मृदा जैविक कार्बन उच्चतम स्तर के साथ 0.87-0.99% थी। आंध्र प्रदेश के मेस्ता उत्पादित क्षेत्रों की मृदा जैविक कार्बन सामाग्री क्रमश: बलजीपेटा और गोलगुवालसा में दर्ज उच्चतम और न्यूनतम स्तर के साथ 0.38-0.58 के बीच थी। तमिलनाडु के नागपट्टिनम जिला में मृदा जैविक कार्बन की मात्र 0.51-0.86 % के बीच थी। यह सरकाज़ी में अधिकतम तथा नक्कमबारी में अधिकतम थी। महाराष्ट्र के राहुरी के प्रयोगात्मक खेत पर बल्क मृदा जैविक कार्बन सामाग्री का स्तर 0.47-0.72 % था। ओड़ीशा के पट्टामुंडाई और केन्द्रपाड़ा विकासखंड के विभिन्न स्थानों में मृदा जैविक कार्बन 0.54-0.73% के बीच थी, जो केन्द्रपाड़ा विकासखंड के चौड़ाकुटाला में अधिकतम थी।

महाराष्ट्र के राहुरी में तोषा पटसन बीज फसल में समेकित पोषण प्रबंधन (75% RDN+ 25% नाइट्रोजन FYM+ 5 कि० ग्रा० $MgSO_4$) द्वारा अधिकतम बीज उपज (17.09 कु०/हे.), अधिकतम सकल लाभ (1,02,580 रू०/है०) तथा शुद्ध लाभ (57,270 रू०/है०) दर्ज किया गया | कार्बनिक पदार्थों की अजैविक उर्वरक खुराक के साथ अंत: क्रिया से पता चला कि F4M3 (NPK @ 80:17.5:33.3 कि० ग्रा०/है०+FYM 5 टन/है०+ चूना @ 25% LR) तथा F5M3 (NPK @ 80:26:50 कि०ग्रा०/है०+FYM 5 टन/है०+ चूना @ 25% LR) उपचार के उपज समतुल्य थे, जिससे आमादालावालसा में वर्ष 2020 में सार्थक रूप से अधिक बीज उपज (17.14-17.58 कु०/हे.) की प्राप्ति हुई। तीन वर्षों के संग्रहित आंकड़ो (2018-20) के आधार पर आंध्र प्रदेश के आमादालावालसा में अधिकतम मेस्ता बीज फसल (12.93 कु०/हे.) हेतु NPK @ 80:26:50 कि० ग्रा०/है०+FYM 5 टन/है०+ चूना @ 25% LR (F5M3) प्रयोग को अनुमोदित की जाती है।

पश्चिम बंगाल के कूचबिहार में हाथ के दो निराई के उपचार से तोषा पटसन में अधिकतम फली/पौध (37.2), बीज/पौध (199), 1000 बीज भार (2.18 ग्रा॰) तथा बीज उपज (2.35 कु॰/हे.) की प्राप्ति हुई जो सांख्यिकी तौर पर अंकुरण के पूर्व प्रेटिलाक्लोर 0.9 कि॰ ग्रा॰+ एक हाथ से निराई या अंकुरण पश्चात क्विजालोफ़ोप ईथाइल 10 EC 38 ग्रा॰+ अंकुरण के 15 दिन बाद एथोक्सिसल्फूरोन @ 135 ग्रा॰/है॰ के प्रयोग के बराबर थी। संग्रहित आंकड़ों के आधार (2018-2020) पर पश्चिम बंगाल के कूचबिहार क्षेत्र में पटसन बीज फसल के फ्लैट बेड बुवाई (3.21 कु॰/हे.) तथा हाथ की दो निराई (3.23 कु॰/हे.) की अनुशंसा की जाती है।

वर्ष 2019-2020 फसल अवधि में पश्चिम बंगाल के कल्याणी में सनई की अधिकतम बीज उपज 15 सितम्बर की बुवाई (21.80 कु॰/हे.) से दर्ज की गई जो 30 सितम्बर (20.00 कु॰/हे.) के बुवाई के समतुल्य थी। अधिकतम बीज उपज SUIN 053 (19.11 कु॰/हे.) से प्राप्त हुआ। इसके बाद बीज उपज का क्रम SUIN 053> SUIN 037> JRJ 610 के रूप में था। आंध्र प्रदेश के आमादालावालसा में अन्य बुवाई वाली तिथियों की तुलना में 30 सितम्बर की बुवाई से अधिकतम (23.78 कु॰/हे.) सनई बीज की प्राप्ति हुई। सार्थक रूप से JRJ 610 द्वारा अधिक बीज उपज (24.85 कु॰/हे.) दर्ज किया गया।

पश्चिम बंगाल के कूचबिहार में फ्लैक्स की बुवाई नवम्बर के प्रथम सप्ताह में करने पर पौधे की अधिकतम ऊंचाई (105.8 से॰ मी॰), आधारीय व्यास (0.41 से॰ मी॰), हरित भार (192.01 कु॰/हे.), शुष्क भार (54.43 कु॰/हे.) सहित रेशा उपज (18.05 कु॰/हे.) दर्ज किया गया। विलम्ब से बुवाई करने पर उपरोक्त में उत्तरोत्तर कमी देखी गई।

पश्चिम बंगाल के बैरकपुर में फ्लैक्स+ पालक (2:1) की अंत: खेती से उच्चतम प्रणाली फ्लैक्स रेशा समतुल्य उपज (25.31 कु॰/हे.) के बाद विशुद्ध फ्लैक्स फसल (19.70 कु॰/हे.) से प्राप्त हुई। कूचबिहार में अधिकतम रेशा समतुल्य उपज की प्राप्ति फ्लैक्स + गार्डेन पी (2:1, 16.45 कु॰/हे.) के बाद फ्लैक्स + ग्रास पी (2:1, 15.90 कु॰/हे.) एवं फ्लैक्स + मसूर (2:1, 15.23 कु॰/हे.) से हुई। असम के नौगाँव में फ्लैक्स बीज की अधिकतम उपज विशुद्ध फ्लैक्स फसल (12.91 कु॰/हे.) से हुई जो सांख्यिकी तौर पर फ्लैक्स+ मसूर (12.20 कु॰/हे.) के समतुल्य थी।

पश्चिम बंगाल के बैरकपुर में रिज एवं फ़रो पद्धति से बोई गई रेमी फसल में नाइट्रोजन की अनुशंषित खुराक का 150% और नाइट्रोजन उर्वरक के 25% भाग को रेमी खाद या रेमी FYM द्वारा प्रतिस्थापित करने पर अधिकतम रेशा उपज (16.26-16.35 कु॰/हे.) मिली। इसी तरह से कूचबिहार में रेमी फसल की उपज (6.50 कु॰/हे., तीन कटाई) में नाइट्रोजन की अनुशंषित मात्रा का 150% प्रयोग करने से मिला। यह सांख्यिकी तौर पर समेकित पोषण प्रबन्धन के समतुल्य था, जिसमें 25% नाइट्रोजन की आपूर्ति FYM/रेमी कम्पोस्ट करने से 6.88 एवं 7.12 कु॰/हे. उपज की प्राप्ति हुई। सोरभोग, असम में अनुशंषित नाइट्रोजन खुराक के 100% का प्रयोग करने से अधिकतम रेशा उपज (16.14 कु॰/हे.) की प्राप्ति हुई। पश्चिम बंगाल के बैरकपुर में प्रत्येक कटाई के बाद नाइट्रोजन @ 75 कि॰ग्रा./है॰ तथा पोटाश @ 50 कि॰ग्रा॰/है॰ के संयोजन से रेमी की अधिकतम रेशा उपज (16.40 कु॰/हे.) की प्राप्ति हुई।

आंध्र प्रदेश के आमादालावालसा में अजैविक NPK @ 120:13:50 कि॰ ग्रा॰/ है॰ की तुलना में अजैविक NPK @ 60:13:50 कि॰ग्रा॰/है॰ या NPK @ 90:13:50 कि॰ग्रा॰/है॰ का प्रयोग वर्मी- कम्पोस्ट के साथ 2 2.5 टन/है॰ सीसल में करने पर अधिकतम पत्ती/पौध (37.6-38.0), हरित पत्तियों का बायोमास (590.16-597.16 कु॰/हे.) तथा रेशा उपज (19.58- 19.81 कु॰/हे.) की प्राप्ति हुई।

फसल संरक्षण

कोविद-19 लॉकडाउन के कारण बैरकपुर तथा कटिहार केंद्रों को छोड़कर अन्य सभी एआईएनपी केंद्रों में कीटों तथा बीमारियों का सर्वेक्षण एवं निगरानी किया गया। पटसन बुवाई के लगभग 35 से 45 दिनों के बाद मई के अंतिम सप्ताह से जून के अंत तक उपर से दूसरी पत्ती मे पीला घुन का प्रकोप नगाँव, केंद्रपाड़ा तथा कूचबिहार मे क्रमशः 1.73, 12.00 तथा 17.64, कीट/से.मी.^{2} पत्ती क्षेत्र देखा गया। बुवाई के 65 से 85 दिनों के बाद जून-अगस्त महीने में नगाँव, कूचबिहार तथा केंद्रपाड़ा में बिहार रोमिल सूड़ी का अधिकतम संक्रमण क्रमशः 26.33, 15.56 और 28.22% देखी गई थी। नागांव में सेमीलूपर से अधिकतम क्षति 9.72% दर्ज की गयी जिसके बाद कूचबिहार और केंद्रपाड़ा में क्रमशः 12.63% तथा 27.91% देखा गया। मिलीबग (5.83%) का संक्रमण विशिष्ट रूप से नगाँव मे था। आमादालावालसा में, मेस्ता एफिड्स, व्हाइटफ्लाइज और लीफहॉपर्स की अधिकतम संख्या 10.82, 1.80 तथा 0.72/पौध थी। सेमीलूपर तथा मिलीबग का संक्रमण 45 तथा 77 दिनों में क्रमशः 51.33% व 77.00% दर्ज की गयी।

पटसन में जड़ व तना सड़न, एन्थ्रेक्नोज तथा मोजेक रोग आम थे। 85 दिनों के दौरान सादा पटसन की पर्ण चित्ती रोग विशिष्ट रूप से केंद्रपाड़ा मे 9.41% तक देखी गयी। 85 से 120 फसल दिवस के दौरान नगाँव, कूचबिहार और केंद्रपाड़ा में तना सड़न का अधिकतम संक्रमण मध्य-जून से सितंबर तक क्रमश:

8.34% (पीडीआई), 32.96 (पीडीआई) तथा 15.59% देखी गई। जड़ सड़न रोग का सर्वाधिक संक्रमण नगाँव, कूचबिहार तथा केंद्रपाड़ा में क्रमशः 11.37%, 29.22% तथा 16.99% था।

नगाँव में, बिहार रोमिल सूड़ी का संक्रमण ओआईएन-174 (31.18%) में अधिकतम थी, जिसके बाद ओआईएन-159 (29.75%) का स्थान रहा। वंशक्रम ओआईएन-153 (12.33%), ओआईएन-139 (12.82%), ओआईएन-136 (12.95%) तथा ओआईएन-138 (15.37%) में इसका संक्रमण कम था। अर्धकुंडलक कीट का संक्रमण क्रमशः ओआईएन-153 (3.57%), ओआईएन-172 (5.15%), ओआईएन-151 (5.71%), ओआईएन-145 (5.97%) तथा ओआईएन-167 (5.93%) में कम दर्ज किया गया। माइट्स की आबादी ओआईएन-138, ओआईएन-142, ओआईएन-148, ओआईएन-149, ओआईएन-172 तथा ओआईएन-178 मे ऊपर से दूसरी पत्ती मे क्रमशः 0.75, 0.58, 0.33, 0.58, 0.58 तथा 0.15/वर्ग से.मी. दर्ज की गई थी। कूचबिहार में, *कैप्सुलारिस* जननद्रव्यों में कीटों का संक्रमण नगण्य पाया गया। वंशक्रम ओआईएन-149 तथा ओआईएन-181 को पीले माइट के संक्रमण के प्रति पूर्णतः प्रतिरक्षी पाया गया। *कैप्सुलारिस* वंशक्रमों में, जेआरसी 698, जेआरसी 517, सीआईएन-160, सीआईएन-175 तथा सीआईएन-185 मे पीली मकड़ी का संक्रमण (ऊपर से दूसरी पत्ती मे /वर्ग से.मी.) उल्लेखनीय रूप से अधिक तथा वंशक्रम सीआइएन-149, सीआइएन-167 और सीआईएन-148 में कम पायी गयी। बिहार रोमिल सूड़ी का संक्रमण 2.13% (सीआईएन-171) से 17.96% (जेआरसी 698) तक था। केंद्रपाड़ा में, तोषा पटसन के प्रमुख कीट पतंगों में पीली मकड़ी, तना घुन तथा अर्ध कुंडलक शामिल थे। पीली मकड़ी के संक्रमण की सीमा 2-13.62% थी। घुन का न्यूनतम संक्रमण ओआईएन-138 (2%) में तथा अधिकतम संक्रमण जेआरओ 524 (13.62%) में पाया गया था। तना घुन का संक्रमण 1.11% से 7.21% के मध्य पाया गया।

कटिहार में, पीली मकड़ी का संक्रमण 5.63 - 27.45/सेमी^{2} के मध्य वंशक्रम ओआईएन-152, ओआईएन-156, ओआईएन-157, ओआईएन-148 में न्यूनतम क्रमशः 5.63, 6.89, 8.37, 8.65, 7.00 घुन/सेमी^{2} दर्ज किया गया। बिहार रोमिल सूड़ी का संक्रमण 4.87 से 30.47% के मध्य पाया गया। अर्ध कुंडलक का संक्रमण 12.52 से 32.25% तक तथा तना घुन का संक्रमण 0.68 से 6.35% तक था।

नगाँव में, प्रभेद ओआईएन-141 जड़ सड़न से मुक्त था। मूल सड़न रोग का प्रकोप वंशक्रम ओआईएन-145 (0.90%), ओआईएन-151 (0.83%), ओआईएन-157 (2.37%), ओआईएन-166 (2.21%), ओआईएन-174 (2.37%), ओआईएन-175 (2.34%) और ओआईएन-180 (2.27%) मे कम देखी गई। मूल सड़न का पीडीआइ वंशक्रम ओआईएन-138 (0.75), ओआईएन-142 (0.58), ओआईएन-148 (0.33), ओआईएन-149 (0.58), ओआईएन-172 (0.58) तथा ओआईएन-178 (0.67) के लिए कम था। जड़ एवं तना सड़न रोग का प्रकोप सादा पटसन के वंशक्रमों मे प्रमुखता से पायी गयी। मूल सड़न का पीडीआइ सीआईएन-162 (0.33), सीआईएन-165 (0.92), सीआईएन-138 (1.75), सीआईएन-140 (1.50), सीआईएन-143 (1.58), सीआईएन-148 (1.67), सीआईएन-154(1.83) तथा सीआईएन-159 (1.75) के लिए कम था। कूचबिहार में, जड़ सड़न का प्रकोप तोषा पटसन के वंशक्रम ओआईएन-142 (6.23%), ओआईएन-147 (5.34), ओआईएन-149 (8.23%), ओआईएन-164 (9.67%, ओआईएन-168) (7.34%), ओआईएन-174 (8.87%), ओआईएन-181 (8.98%) तथा ओआईएन-184 (9.35%) मे सबसे कम तथा ओआईएन-167 (20.98%), ओआईएन-150 (20.97%), ओआईएन-164 (20.36%) व ओआईएन-153 (20.23%) में उच्चतम दर्ज की गई। सीआईएन-148, सीआईएन-152, सीआईएन-154, सीआईएन-171, सीआईएन-172, सीआईएन-173 तथा सीआईएन-178 में कम जड़ सड़न रोग देखी गई। कटिहार में, चेक प्रजाति जेआरओ 204 की तुलना में मूल सड़न रोग का सर्वाधिक संक्रमण ओआईएन-177 (4.91%) में दर्ज की गई, जिसके बाद ओआईएन-177 (4.17%) का स्थान था। कुल 38 वंशक्रमों ने मूल सड़न रोग के प्रति प्रतिरक्षा प्रतिक्रिया दिखाई। केंद्रपाड़ा में, मूल सड़न रोग से मुक्त जननद्रव्य ओआईएन-158, ओआईएन-160 तथा ओआईएन-168 पाये गए। सबसे कम पीडीआइ जननद्रव्य ओआईएन-173 (1.08) जबकि उच्चतम पीडीआइ जेआरओ 524 (18.11) में दर्ज किया गया था, जो बताता है कि ओआईएन-173 मूल सड़न रोग के लिए प्रतिरोधी तथा जेआरओ 524 अतिसंवेदनशील है।

कटिहार में, 45 डीएएस मे लीफ हापर की आबादी 1.32 से 4.68, 52 डीएएस मे 2.49 से 7.58 तथा 59 डीएएस मे 3.25 से 8.12 प्रति पौध थी। सफेद मक्खियां 45 डीएएस में 0.46 से 4.86, 52 डीएएस मे 1.34 से 8.34, और 59 डीएएस मे 2.85 से 9.16 प्रति पौध पायी गयी। आमादालावालसा में, रोजेल जननद्रव्यों मे कीटों के संक्रमण के प्रति जांच मे सभी प्रविष्टियों में एफिड की संख्या प्रति पौधे 0.00 से 10.56 के अंतराल मे कम जबकि आरआईएन-64 में सर्वाधिक दर्ज की गई। आरआईएन-66 तथा आरआईएन-100 सफेद मक्खियों के संक्रमण से पूर्णतः मुक्त थे। वंशक्रम आरआईएन-71 लीफ हापर के संक्रमण से पूर्णतः मुक्त जबकि आरआईएन-96 प्रविष्टि मे सर्वाधिक (0.92 प्रति पौध) संक्रमण दर्ज की गई।

कटिहार में, जड़ एवं तना सड़न रोग की घटना बहुत कम, जोकि शून्य से 4.62% तक सीमित थी। वंशक्रम केआईएन-185 में रोग का सर्वाधिक संक्रमण दर्ज किया गया जिसके बाद केआईएन-208 का स्थान रहा। कुल 26 जननद्रव्य इस रोग से मुक्त थे।

नगांव में, कार्बेन्डाजिम 50 डब्लूपी तथा एजोक्सिस्ट्रोबिन 25% एससी के साथ बीज उपचार से उकठा रोग का प्रकोप कम दर्ज किया गया। प्रतापगढ़ में, थिरम 80 डब्लूपी तथा कार्बेन्डाजिम 50 डब्लूपी 2 ग्रा./कि.ग्रा. बीज की दर से बीज उपचार करने से चेक (10.28 कु०/हे.) की तुलना में उच्चतम रेशा उपज (11.55 कु०/हे.) तथा न्यूनतम उकठा रोग (5.33%) का प्रकोप दर्ज किया गया।

कटिहार में, चूसने वाले कीटों के प्रबंधन हेतु फसल बुवाई के 35 दिनों के बाद (डीएएस) एनएसकेई 5% + अजाडिरैक्टिन (1500 पीपीएम) @ 5 मि.लि./लि. पानी 50 डीएएस + *वर्टिसिलियम लेकानी* @ 6 ग्रा./लि. 65 डीएएस सभी उपचारों में श्रेष्ठ पाया गया, जिसके बाद प्रोफेनोफोस @ 2 मि.लि./लि 35, 50 और 65 डीएएस (स्टैंडर्ड चेक) का छिड़कव प्रभावी रहा।

बैरकपुर में, पंक्तिबद्ध बुवाई वाले पटसन मे 30 डीएएस तथा 50 डीएएस पर घुन की आबादी (14.41 घुन/सेमी2 तथा 13.08 घुन/सेमी2) कम पायी गयी। पटसन में तना सड़न रोग के एकीकृत प्रबंधन में बुवाई के तरीकों के मध्य कोई महत्वपूर्ण अंतर नहीं था। पंक्तिबद्ध बुवाई (5-6 लाख/हे.) के साथ-साथ अन्य उपचारो जैसे कार्बेन्डाजिम 50 डब्ल्यूपी @ 4 ग्रा./किग्रा बीज के साथ बीजोपचार + स्पैरोमेसीफेन 240 एससी @ 0.7 मिली 35 डीएएस + टेबुकोनाजोल 0.15% के 45 डीएएस + लेम्डासायहेलोथ्रिन 5 ईसी @ 0.6 मिली/ली के 45 डीएएस पर छिड़काव उच्च उपज प्राप्त में उल्लेखनीय रूप से महत्वपूर्ण तथा सबसे अच्छा संयोजन रहा।

बैरकपुर में, फसल कटाई से पूर्व तना सड़न रोग का संक्रमण दर्ज किया गया। केवल उपचार से ही तना सड़न रोग पर महत्वपूर्ण प्रभाव पड़ा। उपचार टी-1; कार्बेन्डाजिम 50 डब्ल्यूपी @ 4 ग्रा./किग्रा बीज + 35 डीएएस पर स्पैरोमेसीफेन 240 एससी @ 0.7 मिली/ली. पानी + 45 डीएएस पर टेबुकोनाजोल 0.15% + 55 डीएएस पर लेम्डासायहेलोथ्रिन 5 ईसी @ 0.6 मिली/ली (पीडीआइ 2.54) का छिड़काव एवं टी-2; *ट्राईकोडर्मा* 10 ग्रा./कि.ग्रा. बीज की दर से बीज उपचार + 15 डीएएस पर *स्यूडोमोनास फ्लोरीसेन्स* 100 ग्रा./ली. पानी की दर से मृदा उपचार + 35 तथा 55 दिनो पर अजाडिरैक्टिन (10000 पीपीएम) 3 मिली/ली. पानी की दर से छिड़काव (पीडीआइ 3.27) अनुपचारित फसल, टी-3 (पीडीआइ 4.78) की तुलना मे तना सड़न रोग के रोकथाम मे उल्लेखनीय भूमिका निभाया। नगाँव में, उपचार टी-1 तथा उपचार टी-2 में तना सड़न की घटना लगभग बराबर थी। रेशे की पैदावार टी-3 (21 कु०/हे.) की तुलना में उपचार टी-1 (27.48 कु०/हे.) तथा टी-2 (25.89 कु०/हे.) में काफी अधिक किन्तु, टी-2 की तुलना में टी-1 की रेशा उपज उल्लेखनीय रूप से अधिक पायी गयी।

बैरकपुर में, अतिसंवेदनशील चेक जेआरसी 412 सहित सभी प्रविष्टियों में तना सड़न रोग का संक्रमण कम था। प्रविष्टियों में, जेआरसी 412 में तना सड़न रोग की पीडीआई उच्चतम (5.66) थी जिसके बाद 2.33 के साथ जेआरओ 524 तथा 1.76 के साथ जेआरओ 204 मे दर्ज की गयी। *ऑलिटोरियस* और *कैप्सुलैरिस* दोनों प्रकार के अन्य सभी प्रभेदों ने तना सड़न रोग के प्रति कम पीडीआई (0.6-1.21) दर्शाये। नगांव में, वंशक्रम ओआईएन-07 ने ओआईएन-21, ओआईएन-027, ओआईएन-154 तथा ओआईएन-651 की तुलना में तना सड़न रोग के प्रति काफी संवेदनशील प्रतिक्रिया दर्ज कराया जबकि अन्य सभी प्रविष्टियाँ रोग प्रतिक्रिया में बराबर थीं। प्रभेद ओआईएन-154, ओआईएन-21, ओआईएन-27 तथा ओआईएन-651 में तना सड़न रोग की घटना कम दर्ज की गयी। केंद्रपाड़ा में, न्यूनतम पीडीआई वंशक्रम ओआईएन-21, ओआईएन-125, ओआईएन-07 तथा ओआईएन-154 में क्रमशः 4.00, 4.33, 4.51 तथा 4.59 दर्ज की गई।

नगांव में, 40 दिन की फसल अवधि के दौरान वंशक्रम ओआईएन-11 तथा ओआईएन-14 में अधिकतम संक्रमण क्रमश: 24.00 तथा 22.67 प्रतिशत दर्ज किया गया तथा न्यूनतम संक्रमण (10 %) वंशक्रम ओआईएन-67 में दर्ज की गई। हालांकि 13 प्रविष्टियों की रेशा उपज क्षमता लगभग बराबर थी, किन्तु वंशक्रम ओआईएन-67, ओआईएन-21 तथा ओआईएन-53 ने क्रमशः 28.72 कु०/हे., 28.16 कु०/हे. तथा 28.14 कु०/हे. के साथ स्पष्ट रूप से अधिक रेशा उपज दर्ज कराये। कटिहार में, बुवाई के 30 दिनों से लेकर 50 दिनों तक कीटों का संक्रमण जारी रहा। पीले घुन की आबादी अधिकतम जेआरओ 2407, ओआईएन-61, ओआईएन-67, तथा ओआईजे-08 में क्रमशः 10.81, 7.60, 6.93, 6.31 प्रति वर्ग से.मी. पत्ती क्षेत्र मे बुवाई के 30 दिनो तथा न्यूनतम प्रभेद ओआईएन-10, ओआईएन-34 में क्रमशः 2.58, 2.46 प्रति वर्ग से.मी. पत्ती क्षेत्र दर्ज किया गया। बुवाई के 40 दिनों बाद पीले घुन की अधिकतम आबादी जेआरओ 2407 तथा ओआईएन-61 में क्रमशः 21.13 तथा 9.78 प्रति वर्ग से.मी. पत्ती क्षेत्र मे तथा न्यूनतम

ओआईएन-14 एवं ओआईएन-16 में क्रमशः 5.22 तथा 6.09 दर्ज की गई। केंद्रपाड़ा मे बुवाई के 70 दिनो के बाद वंशक्रम ओआईएन-53 (2.33%) तथा ओआईएन-34 (2.67%) में न्यूनतम संक्रमण दर्ज किया गया। वंशक्रम ओआईएन-34 में उच्चतम रेशा उपज (26.33 कु०/हे.) तथा ओआईएन-10 में न्यूनतम रेशा उपज (19.73 कु०/हे.) दर्ज की गई।

कूचबिहार में, पटसन के 16 जनद्रव्यों के मूल्यांकन के दौरान *एम. इनकोग्निटा* (पुंडीबारी आइसोलेट-5) के प्रति कोई भी प्रतिरोधी अथवा प्रतिरक्षी नहीं पाया गया। जड़ गाँठो में कुछ गल्स एवं अंडों के साथ पांच जननद्रव्य (ओआईएन-05, ओआईएन-13, ओआईएन-154 तथा ओआईएन-853) मध्यम प्रतिरोधी के रूप में पाए गए। पाँच प्रविष्टियाँ (जेआरसी 321, ओआईएन-651 और ओआईएन-125) अतिसंवेदनशील तथा छह प्रविष्टियाँ संवेदनशील पायी गयी।

आदिवासी उप-योजना

फसल वर्ष 2020 के दौरान एआईएनपीजेएएफ के बीसीकेवी कल्याणी; यूबीकेवी, कूचबिहार तथा आरएआरएस, नगांव केन्द्रों के माध्यम से जनजातीय उप-योजना (टीएसपी) का संचालन किया गया। टीएसपी कार्यक्रम पश्चिम बंगाल तथा असम के 03 जिलों (पश्चिम बंगाल के उत्तर 24 परगना और कूचबिहार तथा असम के नगांव) से संबंधित 6 गांवों (पश्चिम बंगाल के श्रीकृष्णपुर, बादलगिर, अतीलडांगा, जगीरबालाबारी और कलमाटी तथा असम के मझगांव जजोरी) में 89आदिवासी किसानों की भागीदारी के तहत कुल 19.12 हे. क्षेत्र में आयोजित किया गया। इस कार्यक्रम के तहत पटसन की नवीनतम किस्मों (जेआरओ 204 & जेबीओ 2003एच), क्रिजैफ मल्टी-रो सीड ड्रिल का उपयोग करते हुए पंक्तिबद्ध बुवाई, एकीकृत खरपतवार प्रबंधन के अंतर्गत क्रिजैफ नेल वीडर, एकीकृत नाशीजीव प्रबंधन तथा क्रिजैफ सोना के उपयोग से उन्नत पटसन सड़न तकनीक पर किसानों के खेतों में सफल प्रक्षेत्र प्रदर्शन आयोजित किए गए। दक्षिण बंगाल में, उत्तर 24 परगना के 19 आदिवासी किसानों को शामिल करते हुए 1.79 हेक्टेयर क्षेत्र में गतिविधियों को अंजाम दिया गया था, जबकि उत्तर बंगाल में, कूचबिहार जिले के 12.0 हेक्टेयर क्षेत्र में 35 आदिवासी किसानों को शामिल करते हुए गतिविधियों को अंजाम दिया गया। असम में, नागांव जिले के गांवों से संबंधित 35 आदिवासी किसानो को कार्यक्रम में शामिल करते हुए 5.33 हेक्टेयर क्षेत्र मे पटसन एवं समवर्गीय रेशा फसलों की उन्नत प्रौद्योगिकियों का प्रदर्शन किया गया। इसके तहत नई किस्मों पर प्रक्षेत्र प्रदर्शन, क्रिजैफ मल्टी-रो सीड ड्रिल, एकीकृत पोषक तत्व प्रबंधन, क्रिजैफ नेल वीडर, पटसन हेतु आइपीएम मॉड्यूल तथा क्रिजैफ सोना के उपयोग से उन्नत पटसन सड़न तकनीक का उपयोग कर कृषकों की सहभागिता सुनिश्चित करते हुए उत्पादन में सुधार लाने हेतु प्रक्षेत्र प्रदर्शन किया गया।

पश्चिम बंगाल में मौजूदा किस्म जेआरओ 524 (26 कु०/हे. & रु. 34850 /-) की तुलना मे नवीनतम किस्म जेबीओ 2003एच तथा जेआरओ 204 के प्रक्षेत्र प्रदर्शनों में 1.5 से 3.0 कु०/हे की अतिरिक्त रेशा उपज के साथ रु. 6300 - रु.12675/हे का अतिरिक्त लाभ प्राप्त हुआ जबकि असम में, पटसन की प्रचलित किस्म जेआरओ 524 (22.83 कु०/हे. एवं रु. 16457/हे.) की तुलना मे नवीन किस्म तरुण से 6.25 कु०/हे. अतिरिक्त रेशा उपज के साथ-साथ रु.25000/हे. का अतिरिक्त लाभ दर्ज किया गया। उत्तर बंगाल में, क्रिजैफ मल्टी-रो सीड ड्रिल का उपयोग करके पंक्तिबद्ध बुवाई प्रक्षेत्र प्रदर्शन से छिड़कवा (22.0 कु०/हे. & रु.12950/हे.) बुवाई की तुलना में 5.0 कु०/हे. की अतिरिक्त उपज के साथ रु. 27125/हे. का अतिरिक्त शुद्ध आय प्राप्त हुआ जबकि, तोषा पटसन में एकीकृत खरपतवार प्रबंधन से 4.0 कु०/हे. अतिरिक्त रेशा उपज के साथ रु. 26900/हे. का अतिरिक्त आय दर्ज किया गया। असम में, तोषा पटसन की हाथ से निराई (23.95 कु०/हे. और 10689/हे.) की तुलना मे क्रिजैफ नेल वीडर का उपयोग कर एकीकृत खरपतवार प्रबंधन वाले प्रक्षेत्र प्रदर्शन में 4.83 कु०/हे. अतिरिक्त रेशा उत्पादन के साथ रु. 24807/हे. का अतिरिक्त शुद्ध लाभ दर्ज किया गया।

About AINP 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 headquarter at JARI, Barrackpore, West Bengal. For a brief period during early seventies, the project functioned from JTRL, (renamed ICAR-National Institute of Natural Fibre Engineering and Technology), but from April, 1974 it was again shifted to its present location at JARI (renamed as ICAR-Central Research Institute for Jute and Allied Fibre in January, 1990).

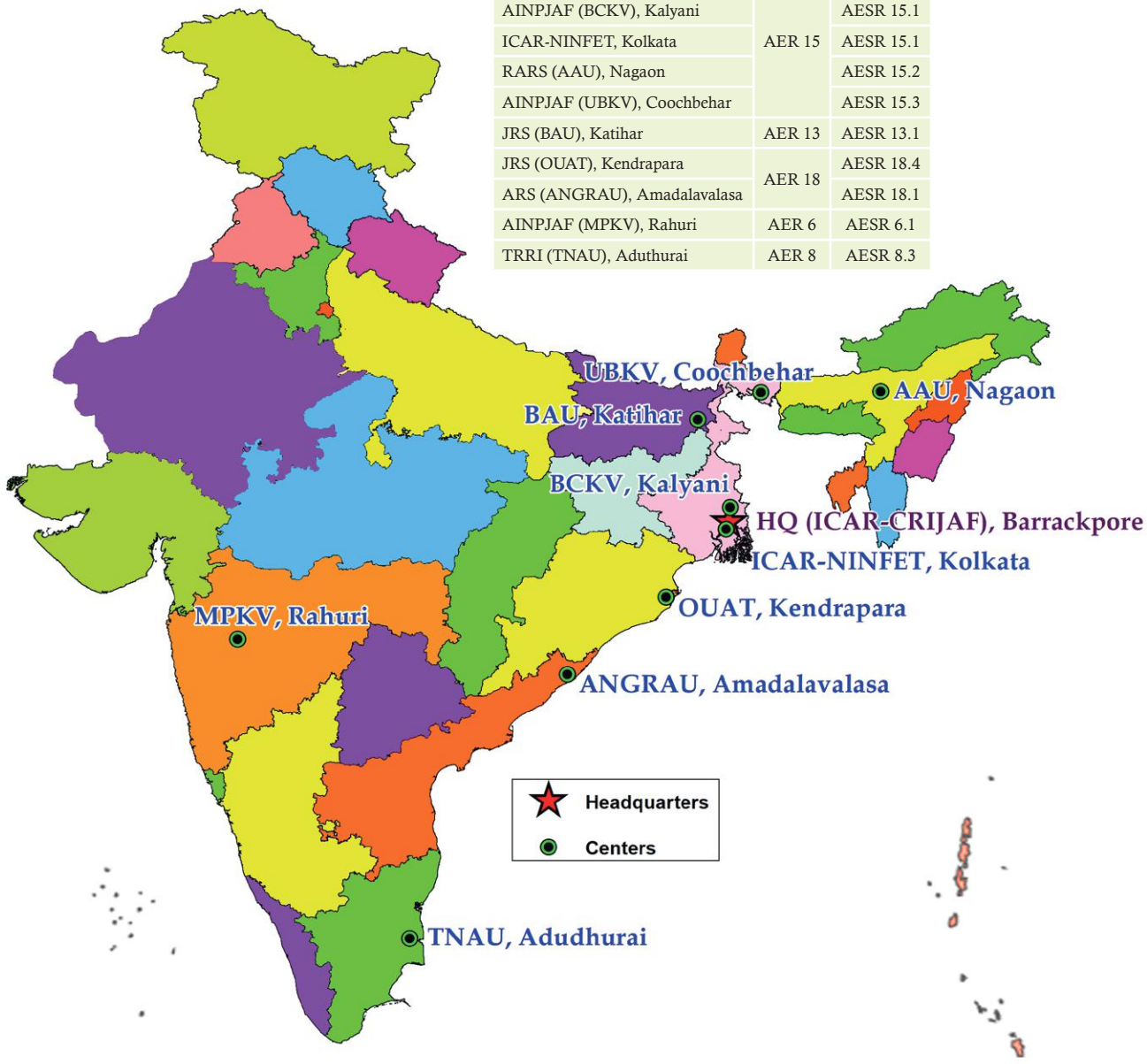
The primary objective of the project was to intensify multi-disciplinary and multi-locational research to develop jute and allied fibre crops for early maturity, faster growth and production of superior quality fibre and to develop appropriate production and protection technology to ensure yield maximization 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 Crop 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. 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. Form 1st April, 2018, Crop Research Station, Bahraich, Uttar Pradesh centre was discountinued from the AINP scheme. ICAR-NINFET, Kolkata was included as a regular centre of AINPJAF in November 2019 for fibre quality evaluation of entries of jute and allied fibre crops tested under various yield evaluation trials.

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. This project facilitates in variety and technology development to solve the location-specific problems in the jute and allied fibre growing states.

AINPJAF Centres

AINP Centres	AER	
AINPNF HQ, Barrackpore	AER 15	AESR 15.1
AINPJAF (BCKV), Kalyani		AESR 15.1
ICAR-NINFET, Kolkata		AESR 15.1
RARS (AAU), Nagaon		AESR 15.2
AINPJAF (UBKV), Coochbehar		AESR 15.3
JRS (BAU), Katihar	AER 13	AESR 13.1
JRS (OUAT), Kendrapara	AER 18	AESR 18.4
ARS (ANGRAU), Amadalavalasa		AESR 18.1
AINPJAF (MPKV), Rahuri	AER 6	AESR 6.1
TRRI (TNAU), Aduthurai	AER 8	AESR 8.3



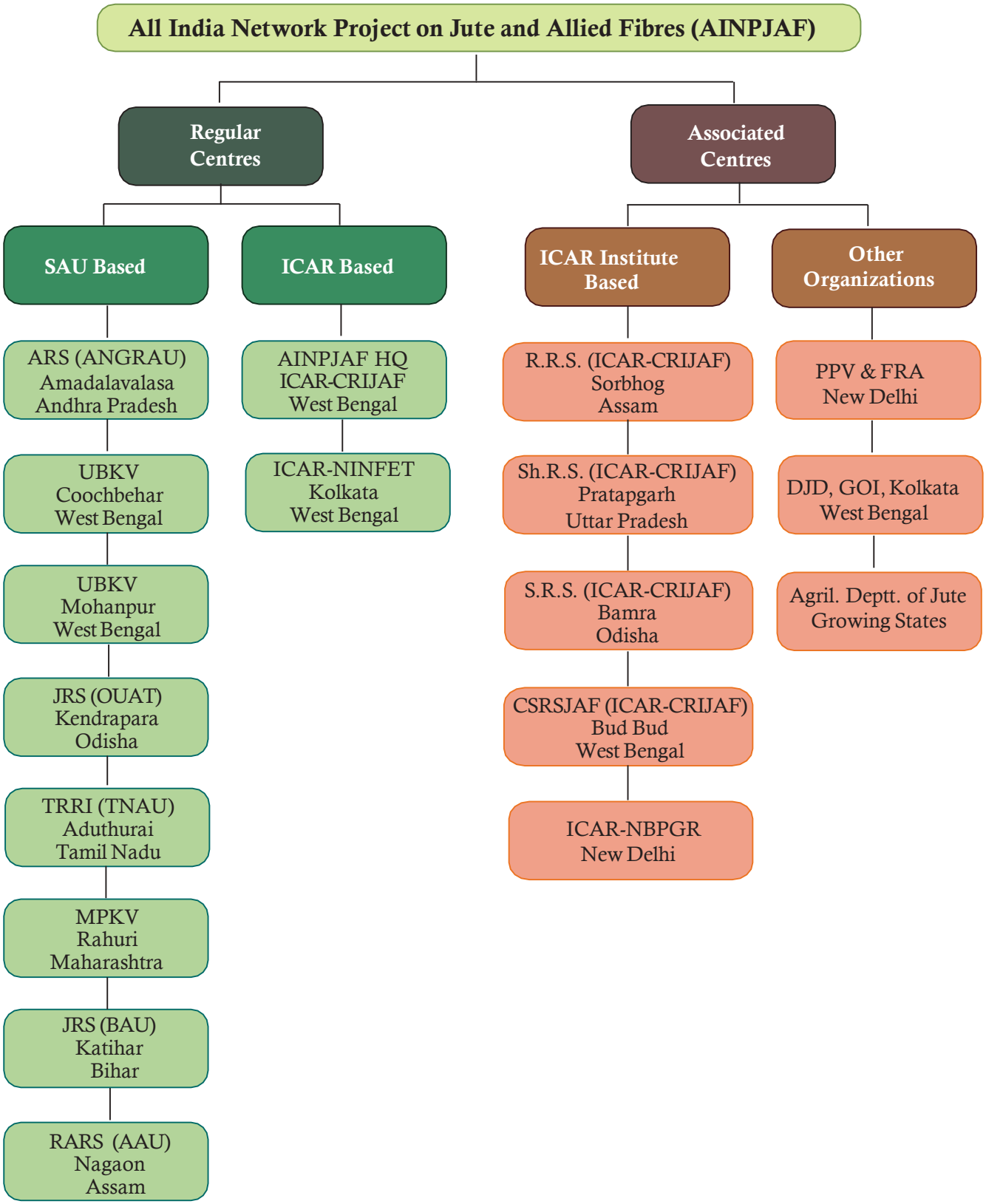
Mandate of AINPJAF

- Development, multi-location evaluation and dissemination of technologies to enhance the productivity and profitability of jute and allied fibre crops on an ecologically and economically sustainable basis of the country.

Objectives of AINPJAF

- Generation and evaluation of new genetic material in multi-location trials to identify genotypes with broad and specific adaption
- Development, evaluation and validation of crop management technologies for sustainable production and ensuring protection from biotic and abiotic stresses
- Pre-breeding and trait discovery for improving crops using diverse germplasm resources
- Varietal maintenance and seed production
- Share experience, knowledge and genetic material among the stakeholders working in different parts

Organizational Chart



Significant Achievements under AINPJAF during 2020

Crop Improvement

Under crop improvement programme, thirty-four projects comprising of 152 trials were conducted on jute and allied fibre crops in different centres.

NP(JB) 1.8: Evaluation of *C. capsularis* jute germplasm

A set of 50 germplasm lines of *C. capsularis* jute were screened at five locations, *viz.* Kalyani, Coochbehar, Kendrapara, Nagaon and Katihar. To assess the fibre yield potential under recommended agronomic practices, data was collected on fibre yield, plant height, basal diameter and green weight. Two varieties, JRC 517 and JRC 698 were used as checks. The trials were failed at Katihar and Kendrapara due to heavy rainfall, data from rest of the centres are discussed below.

Kalyani: All the observations were recorded on 135 DAS (days after sowing) at harvest stage. Plant height of the accessions ranged from 249 cm (CIN-143) to 385 cm (CIN-178) and 314±27.8 cm was the mean plant height in this location. Four accessions surpassed better check JRC 698 (350 cm) for plant height. Mean basal diameter was 1.76±0.26 cm and ranged from 1.11 cm (CIN-181) to 2.33 cm (CIN-138). Average green biomass/plant was found to be 238.7±55.6 g and varied from 101.3 g (CIN-151)-332.0 g (CIN-174). Fibre yield of the accessions ranged from 5.0 (CIN-143) to 21.2 g/plant (CIN-138) with a mean of 11.0±3.8 g/plant. Accession CIN-138 (21.2 g/plant) surpassed better check JRC 698 (20.2 g/plant) for this character.

Capsularis jute germplasm evaluation at Kalyani

Coochbehar: In this centre, all the observations were recorded at 120 DAS. Plant height ranged from 136 cm (CIN-182) to 312 cm (CIN-171) with a mean of 256±36.4 cm. Five accessions surpassed better check JRC 517 (296 cm) for plant height. Average basal diameter in this location was 1.40±0.23 cm. Average green biomass/plant of the accessions was 284.7±59.7 g and ranged from 156.0 (CIN-150) to 379.5 g/plant (CIN-172). Fibre yield/plant ranged from 10.9 g (CIN-150) to 25.9 g (CIN-172) with an average of 18.7±4.5 g/plant. Twenty-two genotypes outperformed best check JRC 517 (18.9 g/plant) for fibre yield.

Nagaon: Observations were recorded at 130 DAS. Average plant height in this location was 235±20.2 cm and ranged from 197 cm (CIN-151) to 294 cm (CIN-177). Five accessions were found taller than the best check JRC 517 (256 cm). Basal diameter varied from 1.19 cm (CIN-156) to 1.49 cm (CIN-171) with a mean of 1.35±0.07 cm. Average green biomass/plant was found to be 176.9±35.5 g at this location. Mean fibre yield per plant was 14.4±3.0 g and ranged from 8.1 g (CIN-142) to 23.1 g (CIN-173). Ten accessions outperformed better check JRC 517 (16.7 g/plant) for fibre yield.

Overall performance: Comparative evaluation of fibre yield over locations revealed significant variability of the 50 accessions over locations (table 1.1). An overall mean of 14.3±2.6 g/plant was recorded for fibre yield over three locations with a range of 9.2 g/plant (CIN-142) to 20.7 g/plant (CIN-173). Four genotypes outperformed better check JRC 517 (17.5 g/plant) for fibre yield. A comparative performance of best four accessions for fibre yield over the three locations is presented in figure 1.1. Among the three locations, Coochbehar centre recorded highest mean performance for fibre yield (18.7±4.5 g/plant) and the entry CIN-172 recorded highest fibre yield of 25.9 g/plant in this location.

Table 1.1 Fibre yield (g/plant) of 50 *C. capsularis* jute accessions in five locations

Accession	Kalyani	Coochbehar	Nagaon	Mean
CIN-136	12.0	21.7	11.2	15.0
CIN-137	14.7	14.9	11.2	13.6
CIN-138	21.2	18.9	14.1	18.1
CIN-139	19.1	18.0	15.4	17.5
CIN-140	13.6	19.7	17.1	16.8
CIN-141	15.4	-	10.9	13.1
CIN-142	10.4	-	8.1	9.2
CIN-143	5.0	-	13.6	9.3
CIN-144	10.5	-	11.2	10.8
CIN-145	15.7	-	18.1	16.9
CIN-146	11.6	-	17.3	14.5
CIN-147	9.6	19.4	16.1	15.0
CIN-148	11.6	24.7	14.9	17.1
CIN-149	10.4	18.7	12.3	13.8
CIN-150	15.0	10.9	15.1	13.7
CIN-151	5.5	11.4	15.9	10.9
CIN-152	17.8	13.6	18.7	16.7
CIN-153	5.7	11.0	13.6	10.1
CIN-154	8.9	23.1	14.4	15.5
CIN-155	9.5	19.0	12.3	13.6
CIN-156	12.8	13.0	19.1	15.0
CIN-158	9.9	13.9	14.6	12.8
CIN-159	7.2	12.4	8.4	9.4
CIN-160	7.8	22.9	16.6	15.7
CIN-161	10.0	25.3	17.1	17.5
CIN-162	8.7	-	14.4	11.6
CIN-163	9.3	-	16.6	12.9
CIN-164	12.8	-	17.3	15.1
CIN-165	9.6	-	17.4	13.5
CIN-166	7.8	21.4	13.1	14.1
CIN-167	5.3	21.7	12.0	13.0
CIN-168	7.6	20.4	12.3	13.4
CIN-169	6.1	20.3	13.4	13.3
CIN-170	12.8	20.7	14.3	15.9
CIN-171	9.5	21.3	16.6	15.8
CIN-172	13.3	25.9	13.6	17.6
CIN-173	13.5	25.6	23.1	20.7
CIN-174	16.1	19.8	15.6	17.1
CIN-175	5.9	24.1	13.8	14.6

Accession	Kalyani	Coochbehar	Nagaon	Mean
CIN-176	14.3	18.1	20.0	17.5
CIN-177	12.1	14.5	15.7	14.1
CIN-178	17.9	22.5	14.4	18.3
CIN-179	11.1	17.5	13.3	14.0
CIN-180	8.4	12.5	14.3	11.7
CIN-181	5.4	13.7	9.2	9.4
CIN-182	9.0	14.1	15.0	12.7
CIN-183	11.2	13.7	14.0	13.0
CIN-184	8.9	20.3	12.1	13.8
CIN-185	10.8	22.7	9.7	14.4
CIN-186	12.0	23.2	10.6	15.2
JRC 517+	16.9	18.9	16.7	17.5
JRC 698+	20.2	15.8	16.2	17.4
Min.	5.0	10.9	8.1	9.2
Max.	21.2	25.9	23.1	20.7
Mean	11.0	18.7	14.4	14.3
SD	3.8	4.5	3.0	2.6

+; check variety

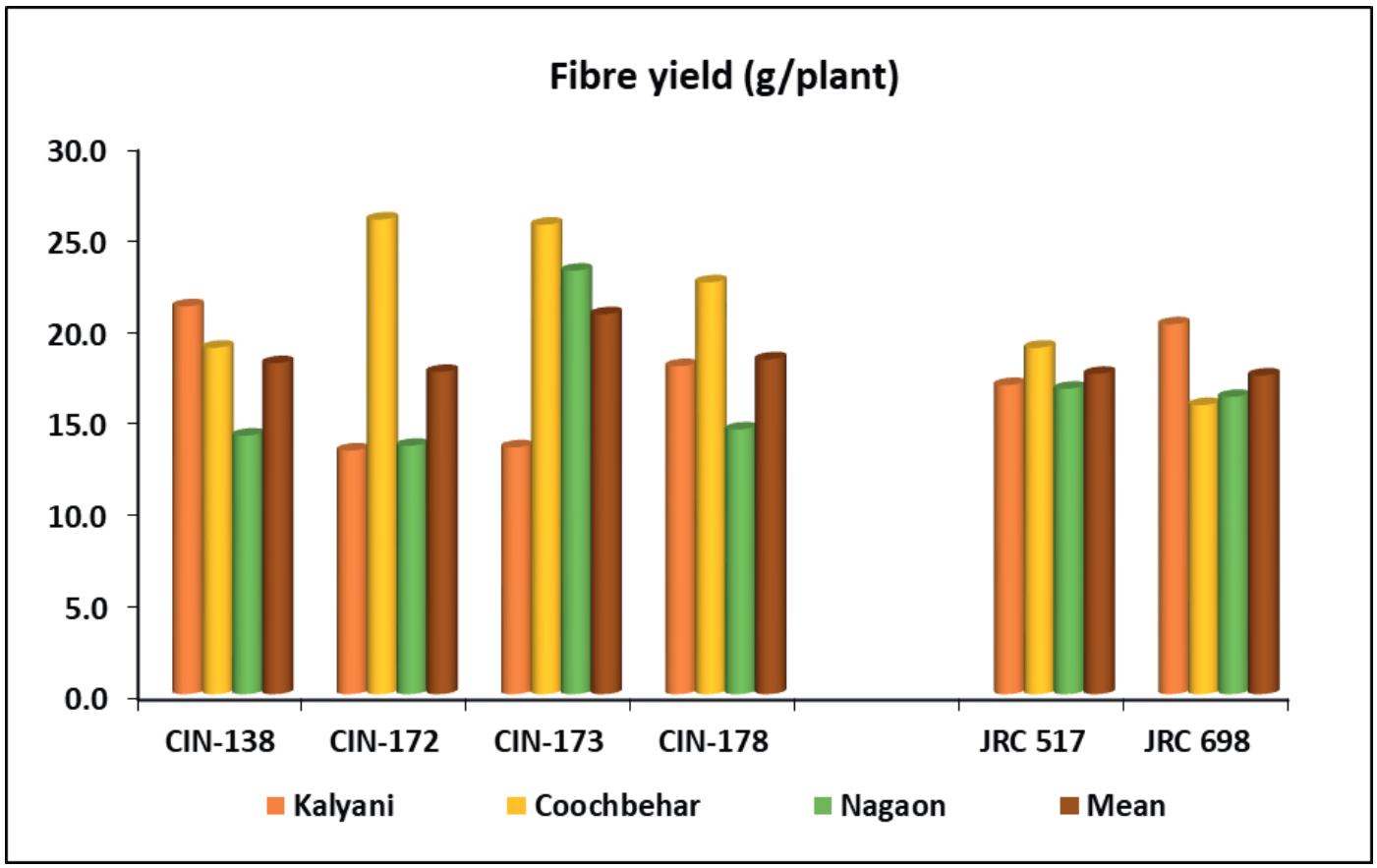


Figure 1.1 Fibre yield (g/plant) of best four C. capsularis accessions over three locations

NP(JB) 1.9: Evaluation of *C. olitorius* jute germplasm

A panel of fifty accessions of *C. olitorius* were screened for fibre yield and yield related traits (Plant height, basal diameter and green weight) in six locations, *viz.* Kalyani, Coochbehar, Kendrapara, Nagaon, Katihar and Rahuri. Two varieties JRO 524 and JRO 204 were used as checks in the experiment. Significant results from four centres except Katihar and Kendrapara (trials were failed due to heavy rainfall) are summarised below.

Kalyani: Data was recorded at 136 DAS. Plant height of the accessions ranged from 252 cm (OIN-162) to 397 cm (OIN-146) with a mean of 347±29.5 cm. Fourteen accessions outperformed better check JRO 204 (363 cm) for plant height. Average basal diameter of the accessions was 1.60±0.20 cm. Average green biomass/plant of the accessions was 262.2±60.7 g and ranged between 154.3 g (OIN-173) to 441.0 g (OIN-146). Fibre yield/plant varied from 8.1 g (OIN-169) to 25.3 g (OIN-146) and 14.4±3.6 g/plant was the mean fibre yield in this centre. Accession OIN-146 (25.3 g/plant) followed by OIN-184 (22.6) exhibited higher fibre yield than the better check JRO 524 (22.1 g/plant).

Olitorius jute germplasm evaluation at Kalyani

Coochbehar: Records were taken on 120 DAS at harvestable maturity. Plant height of the accessions varied from 202 (OIN-150) to 350 cm (OIN-172) with a mean of 273±29.6 cm. Twenty accessions surpassed better check JRO 204 (269 cm) for plant height. Average basal diameter of the accessions was 1.54±0.20 cm. Average green weight was 258.0±49.8 g/plant (range 179.4 9-339.8 g/plant). Fibre yield/plant ranged from 10.7 (OIN-150) to 21.7 g (OIN-147) with a mean of 15.6±3.2 g/plant. Fifteen accessions exceeded better check JRO 524 (16.9 g/plant) for fibre yield.

Nagaon: All the observations were recorded at 132 DAS. Plant height varied from 301 cm (OIN-160) to 354 cm (OIN-183) in this location with an average of 330±11.1 cm. Eight genotypes expressed superior performance than best check variety JRO 204 (341 cm) for plant height. Average basal diameter in this location was 1.24±0.26 cm. Green biomass weight ranged from 186.7 g/plant (OIN-166) to 450.0 g/plant (OIN-182) and 265.8±52.3 g was the mean green biomass/plant. Average fibre yield/plant was 23.9±3.9 g and the trait varied from 16.6 (OIN-166) to 34.6 g/plant (OIN-177). Twenty-four accessions found superior to better check JRO 524 (23.7 g/plant) for fibre yield at this centre.

Rahuri: In this centre data was recorded at 111 DAS. Mean plant height of the accessions in this location was recorded to be 312±12.9 cm and range was 284 cm (OIN-165) to 353 cm (OIN-185). Accession OIN-185 (353 cm) was taller than the better check JRO 204 (349 cm). Basal diameter varied from 1.25-2.11 cm with a mean of 1.73±0.13 cm. Green biomass weight ranged from 178.0 to 410.0 g/plant and 279.3±55.4 g was the mean green biomass/plant. Fibre yield/plant ranged from 7.8 g (OIN-176) to 16.2 g (OIN-136) with a mean of 11.2±1.6 g/plant. Nine genotype outperformed better check JRO 204 (12.3 g/plant) for fibre yield.

Olitorius jute germplasm evaluation at Rahuri

Overall performance: Comparative evaluation of fibre yield over four locations revealed significant variability of the 50 accessions over locations (table 1.2). Average fibre yield over the locations was recorded to be 16.3±1.6 g/plant with a range of 13.3 g/plant (OIN-176) to 19.6 g/plant (OIN-148). Five accessions outperformed better

check JRO 524 (18.6 g/plant) for fibre yield. A comparative description of performance of best five accessions for fibre yield over the four locations is presented in figure 1.2. Among the six centres, Nagaon centre recorded highest mean fibre yield of 23.9±3.9 g/plant and accession OIN-177 recorded highest fibre yield of 34.6 g/plant in this centre.

Table 1.2 Fibre yield (g/plant) of 50 *C. olitorius* accessions in four locations

Accession	Kalyani	Coochbehar	Nagaon	Rahuri	Mean
OIN-136	15.6	-	24.6	16.2	18.8
OIN-137	12.6	-	21.0	13.2	15.6
OIN-138	15.3	-	19.4	12.4	15.7
OIN-139	16.7	-	22.6	11.9	17.0
OIN-140	13.7	20.0	20.6	11.3	16.4
OIN-141	13.3	20.2	30.4	9.4	18.3
OIN-142	17.2	18.3	18.3	10.5	16.1
OIN-143	12.3	19.1	21.7	11.6	16.2
OIN-144	12.3	-	23.8	11.6	15.9
OIN-145	14.0	-	26.0	11.5	17.1
OIN-146	25.3	14.7	21.7	10.4	18.0
OIN-147	14.2	21.7	28.3	11.7	19.0
OIN-148	19.9	15.3	30.0	13.4	19.6
OIN-149	12.4	12.4	28.1	14.1	16.8
OIN-150	14.9	10.7	25.0	11.5	15.5
OIN-151	12.6	12.7	24.7	10.1	15.0
OIN-152	14.7	19.4	23.1	12.2	17.4
OIN-153	13.3	12.7	22.0	11.5	14.9
OIN-154	14.2	13.9	22.6	10.9	15.4
OIN-155	10.7	-	19.9	10.4	13.7
OIN-156	16.6	-	23.7	12.2	17.5
OIN-157	15.2	-	27.0	11.4	17.9
OIN-158	12.5	-	19.9	13.5	15.3
OIN-159	12.2	14.2	24.0	9.9	15.1
OIN-160	16.4	10.7	25.4	9.0	15.4
OIN-161	15.5	12.9	27.7	13.4	17.4
OIN-162	8.5	17.0	25.2	9.4	15.0
OIN-163	14.2	18.2	21.3	8.7	15.6
OIN-164	11.8	12.5	20.2	11.2	13.9
OIN-165	13.8	15.6	22.3	11.3	15.7
OIN-166	20.4	15.6	16.6	11.9	16.1
OIN-167	17.1	17.4	25.2	9.1	17.2
OIN-168	13.6	13.6	23.4	11.4	15.5
OIN-169	8.1	-	22.6	10.9	13.9
OIN-170	21.6	-	22.3	11.8	18.6

Accession	Kalyani	Coochbehar	Nagaon	Rahuri	Mean
OIN-171	12.6	11.9	24.6	11.1	15.0
OIN-172	14.9	16.4	17.8	10.8	15.0
OIN-173	9.4	12.8	24.8	12.7	14.9
OIN-174	17.9	13.6	24.6	11.0	16.7
OIN-175	12.8	13.5	34.2	13.5	18.5
OIN-176	8.1	11.7	25.8	7.8	13.3
OIN-177	10.8	11.2	34.6	10.1	16.7
OIN-178	17.2	20.2	31.6	9.0	19.5
OIN-179	18.6	17.3	23.0	8.5	16.9
OIN-180	16.3	17.3	23.0	9.8	16.6
OIN-181	11.6	19.5	18.7	10.3	15.0
OIN-182	10.9	14.9	27.8	11.3	16.2
OIN-183	14.8	18.5	24.4	10.0	16.9
OIN-184	22.6	21.1	22.4	11.6	19.4
OIN-185	11.3	15.7	19.8	10.9	14.4
JRO 524+	22.1	16.9	23.7	11.7	18.6
JRO 204+	16.3	16.7	19.8	12.3	16.2
Min.	8.1	10.7	16.6	7.8	13.3
Max.	25.3	21.7	34.6	16.2	19.6
Mean	14.4	15.6	23.9	11.2	16.3
SD	3.6	3.2	3.9	1.6	1.6

+; check variety

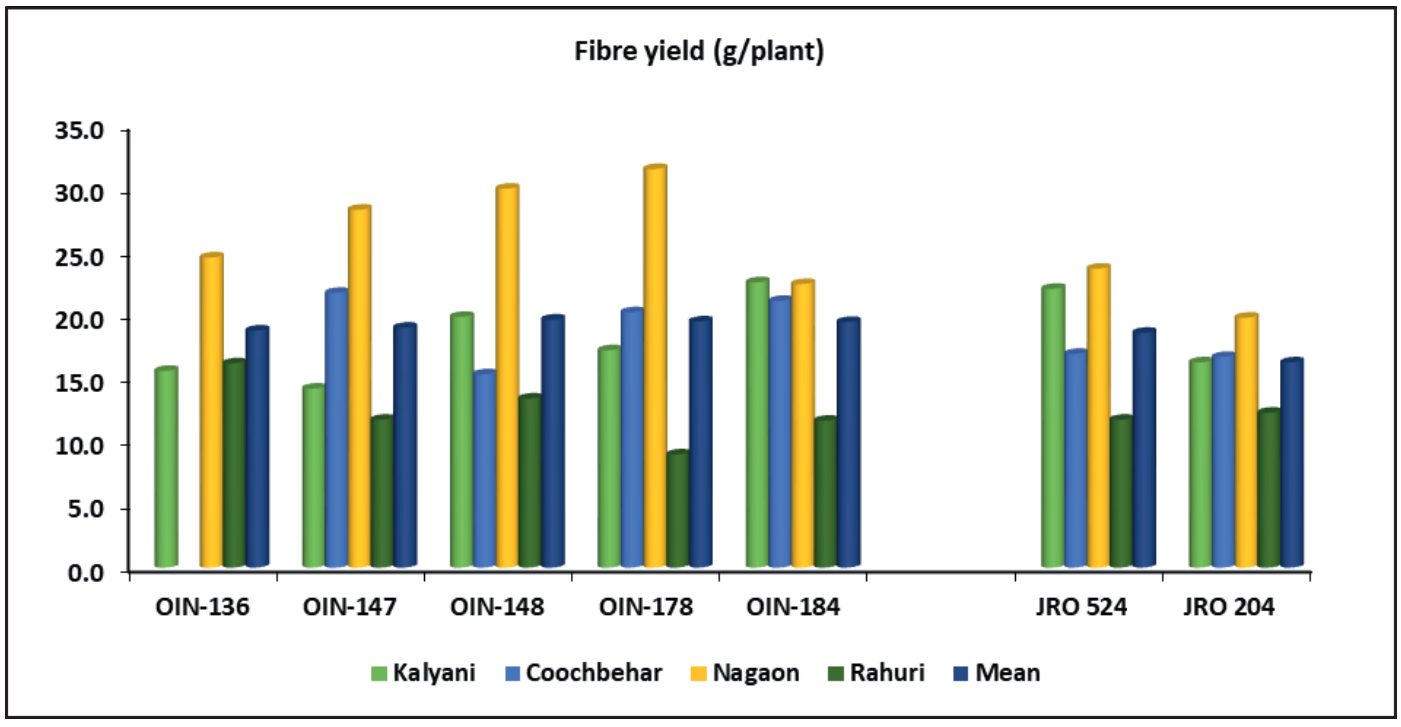


Figure 1.2 Fibre yield (g/plant) of best five C. olitorius accessions over four locations

NP (MB) 1.8: Evaluation of roselle germplasm

A total of 50 rosell (*Hibiscus sabdariffa*) accessions with two checks (HS 4288 and AMV 5) were evaluated for fibre yield and yield related traits in four locations, *viz.* Amadalavalasa, Katihar, Aduthurai and Barrackpore. Crop growth was stunted due to late sowing, hence data not recorded at Barrackpore centre. Significant results from rest of the locations are discussed below.

Aduthurai: Observations were recorded at 149 DAS. Plant height varied from 190 cm (RIN-72) to 249 cm (RIN-86) in this location with an average of 220±12.2 cm. Average basal diameter was 1.43±0.20 cm. Average fibre yield/plant was recorded to be 8.3±1.5 g and the trait varied from 5.1 g (RIN-72) to 12.3 g (RIN-99). Fourteen accessions were found superior to better check AMV 5 (9.0 g/plant) for fibre yield.

Amadalavalasa: Data was noted at 156 DAS. Plant height of the accessions varied from 212 cm (RIN-78) to 310 cm (RIN-100) with a mean of 245±21.2 cm. Accession RIN-100 (310 cm) followed by RIN-115 (297 cm) surpassed better check AMV 5 (275 cm) for plant height. Average basal diameter of the accession was 1.81±0.14 cm. Average green weight was 222.3±11.5 g/plant. Fibre yield/plant ranged from 9.1 g (RIN-92) to 12.1 g (RIN-79) with a mean of 10.8±0.7 g/plant. Thirteen accessions expressed superior performance than best check HS 4288 (11.1 g) for fibre yield/plant.

Roselle germplasm evaluation at Amadalavalasa

Katihar: All the observations were recorded at 142 DAS. Plant height ranged from 160 cm (RIN-95) to 287 cm (RIN-100) with a mean of 230±27.0. Accession RIN-100 (287 cm) followed by RIN-98 (282 cm) were taller than better check AMV 5 (267 cm). Average basal diameter in this location was 1.18±0.07 cm. Fibre yield/plant ranged from 5.2 g (RIN-64) to 11.7 g (RIN-93) with an average of 8.3±1.3 g/plant. Four accessions outperformed best check AMV 5 (10.1 g/plant) for fibre yield.

Overall performance: Comparative evaluation of fibre yield over locations revealed significant variability of the 50 accessions over locations (Table 1.3). An overall mean of 8.9±0.9 g/plant was recorded for fibre yield over three locations with a range of 6.4 g/plant (RIN-64) to 10.6 g/plant (RIN-100). Five accessions outperformed better check AMV 5 (10.0 g/plant) for fibre yield. A comparative performance of best five accessions for fibre yield over three locations is presented in figure 1.3. Among the three locations, Amadalavalasa centre recorded highest mean performance for fibre yield (10.8±0.7 g/plant) and the accession RIN-79 recorded highest fibre yield of 12.1 g/plant in this location.

Table 1.3 Fibre yield (g/plant) of 50 *H. sabdariffa* accessions in four locations

Accession	Aduthurai	Amadalavalasa	Katihar	Mean
RIN-64	7.7	-	5.2	6.4
RIN-66	9.4	-	6.3	7.9
RIN-67	8.1	-	7.5	7.8
RIN-68	7.4	11.2	8.5	9.0
RIN-69	9.1	10.7	7.9	9.2
RIN-70	8.0	10.6	7.1	8.6
RIN-71	8.2	-	8.6	8.4
RIN-72	5.1	-	7.9	6.5

Accession	Aduthurai	Amadalavalasa	Katihar	Mean
RIN-73	6.5	10.1	-	8.3
RIN-74	7.5	-	7.7	7.6
RIN-75	7.8	10.5	8.2	8.9
RIN-76	6.8	10.5	8.0	8.4
RIN-77	8.4	-	7.8	8.1
RIN-78	9.9	11.6	6.8	9.4
RIN-79	9.0	12.1	7.3	9.5
RIN-80	6.5	11.7	7.4	8.5
RIN-81	7.8	-	7.8	7.8
RIN-82	8.2	11.5	8.0	9.2
RIN-83	7.5	10.3	8.3	8.7
RIN-84	7.4	10.2	9.4	9.0
RIN-85	8.4	11.8	8.2	9.5
RIN-86	9.5	10.2	8.0	9.2
RIN-87	6.5	11.5	6.8	8.3
RIN-88	8.6	10.8	7.7	9.0
RIN-89	7.1	-	7.6	7.3
RIN-90	5.6	11.9	8.3	8.6
RIN-91	6.9	10.1	9.8	9.0
RIN-92	6.4	9.1	7.5	7.7
RIN-93	8.0	11.8	11.7	10.5
RIN-94	9.7	10.9	9.2	10.0
RIN-95	9.4	-	8.2	8.8
RIN-96	9.1	-	11.3	10.2
RIN-98	9.7	-	10.5	10.1
RIN-99	12.3	9.7	8.5	10.2
RIN-100	11.3	9.4	11.1	10.6
RIN-101	11.4	10.2	7.5	9.7
RIN-102	9.4	10.2	7.9	9.2
RIN-103	8.4	10.5	7.3	8.7
RIN-105	8.4	11.3	7.7	9.1
RIN-106	7.2	11.8	9.0	9.3
RIN-107	7.3	-	9.6	8.4
RIN-108	7.9	10.7	8.9	9.2
RIN-109	6.9	10.4	8.1	8.5
RIN-111	6.3	11.6	9.7	9.2
RIN-112	7.7	11.2	7.6	8.8
RIN-113	8.9	-	7.6	8.2
RIN-114	8.6	-	9.3	8.9
RIN-115	9.4	10.8	9.7	10.0

Accession	Aduthurai	Amadalavalasa	Katihar	Mean
RIN-117	11.4	10.7	9.3	10.4
RIN-118	8.8	10.5	9.0	9.4
HS 4288+	8.4	11.1	9.5	9.7
AMV 5+	9.0	11.0	10.1	10.0
Min.	5.1	9.1	5.2	6.4
Max.	12.3	12.1	11.7	10.6
Mean	8.3	10.8	8.3	8.9
SD	1.5	0.7	1.3	0.9

+; check variety

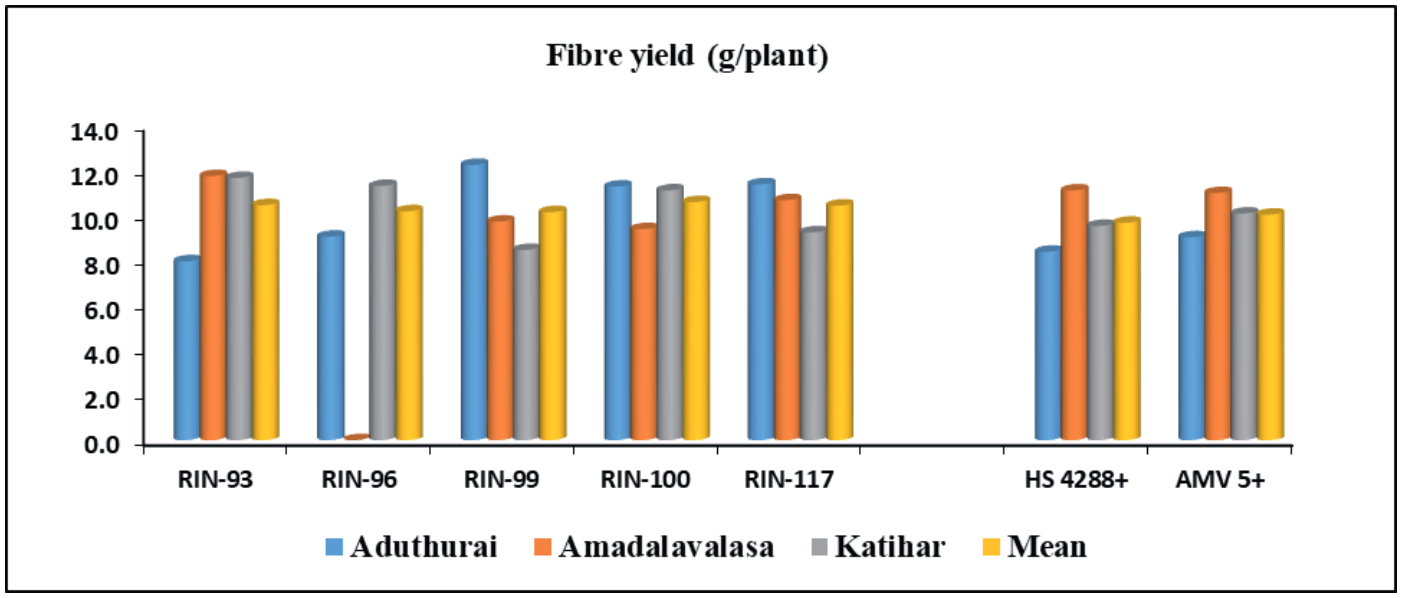


Figure 1.3 Fibre yield (g/plant) of best five H. sabdariffa accessions over three locations

NP(MB) 1.9: Evaluation of kenaf germplasm

A set of 50 accessions of kenaf (*Hibiscus cannabinus*) with two checks HC 583 and AMC 108 were screened for fibre yield and yield related traits (Plant height, basal diameter and green weight) in three locations, *viz.* Barrackpore, Amadalavalasa and Aduthurai. Crop growth was stunted due to late sowing, hence data not recorded at Barrackpore centre. Centre wise results are presented below.

Amadalavalasa: Data was noted at 156 DAS. Plant height varied from 207 cm (KIN-186) to 307 cm (KIN-205) in this location with an average of 251±22.0 cm. Accession KIN-205 found taller than better check HC 583 (298 cm) for plant height. Average basal diameter in this location was 1.90±0.25 cm. Average green biomass yield/plant was recorded to be 258.9±92.8 g and ranged from 140.6 (KIN-205) to 547.3 g/plant (KIN-224). Fibre yield/plant varied from 6.3 (KIN-205) to 26.5 g (KIN-224) with an average of 12.5±4.4 g/plant. Thirty-three accessions found superior to better check HC 583 (10.1 g/plant) for this character.

Kenaf germplasm evaluation at Amadalavalasa

Aduthurai: All the observations were recorded at 117 DAS. Plant height of the accessions ranged from 176 cm (KIN-196) to 249 cm (KIN-222, KIN-223) with a mean of 220±20.4 cm. Eighteen accessions outperformed better check HC 583 (229 cm) for plant height. Average basal diameter of the accession was 1.49±0.35 cm. Fibre yield/plant ranged from 5.3 g (KIN-225) to 10.9 g (KIN-196) with a mean of 7.8±1.4 g/plant. Eight accessions outperformed best check AMC 108 (9.17 g/plant) for this character.

Overall performance: Comparative evaluation of fibre yield over locations revealed significant variability of the 50 accessions over locations (Table 1.4). An overall mean of 10.1±2.3 g/plant was recorded for fibre yield over two locations with a range of 6.4 g/plant (KIN-225) to 16.4 g/plant (KIN-224). Twenty-six genotypes outperformed better check AMC 108 (9.7 g/plant) for fibre yield. A comparative performance of best five accessions for fibre yield over two locations is presented in figure 1.4. Among the two locations, Amadalavalasa centre recorded highest mean performance for fibre yield (12.5±4.4 g/plant) and the accession KIN-224 recorded highest fibre yield of 16.5 g/plant in this location.

Table 1.4: Fibre yield (g/plant) of 50 *H. cannabinus* accessions in two locations

Accession	Aduthurai	Amadalavalasa	Mean	Accession	Aduthurai	Amadalavalasa	Mean
KIN-179	9.0	11.7	10.4	KIN-208	7.0	10.8	8.9
KIN-180	8.5	10.9	9.7	KIN-209	8.8	10.4	9.6
KIN-181	10.8	14.7	12.8	KIN-210	6.4	12.8	9.6
KIN-182	8.8	13.4	11.1	KIN-211	6.6	13.8	10.2
KIN-183	9.6	10.9	10.2	KIN-212	6.5	20.2	13.3
KIN-184	10.2	10.7	10.4	KIN-213	6.2	13.1	9.6
KIN-185	9.4	15.4	12.4	KIN-214	7.8	9.1	8.4
KIN-186	6.7	10.1	8.4	KIN-215	8.8	20.8	14.8
KIN-187	7.2	9.8	8.5	KIN-216	6.5	9.3	7.9
KIN-188	7.9	13.6	10.8	KIN-217	7.9	7.8	7.8
KIN-189	7.7	14.2	10.9	KIN-218	7.5	8.5	8.0
KIN-190	8.6	20.8	14.7	KIN-220	6.7	12.8	9.8
KIN-191	9.5	12.4	11.0	KIN-221	7.7	12.9	10.3
KIN-192	7.2	12.8	10.0	KIN-222	6.1	18.9	12.5
KIN-193	7.5	8.9	8.2	KIN-223	5.9	23.8	14.9
KIN-194	8.5	17.8	13.1	KIN-224	6.4	26.5	16.4
KIN-195	8.9	9.1	9.0	KIN-225	5.3	7.6	6.4
KIN-196	10.9	10.7	10.8	KIN-226	6.3	11.9	9.1
KIN-197	8.8	12.5	10.7	KIN-227	5.5	7.9	6.7
KIN-198	8.4	11.7	10.1	KIN-228	7.5	10.1	8.8
KIN-199	9.7	13.8	11.8	KIN-229	7.1	19.0	13.0
KIN-200	8.8	12.3	10.5	KIN-230	7.0	8.3	7.6
KIN-202	7.4	8.2	7.8	HC 583+	8.9	8.0	8.5
KIN-203	10.4	6.7	8.6	AMC 108+	9.2	10.1	9.7
KIN-204	6.2	7.6	6.9	Min.	5.3	6.3	6.4
KIN-205	7.1	6.3	6.7	Max.	10.9	26.5	16.4
KIN-206	7.3	11.7	9.5	Mean	7.8	12.5	10.1
KIN-207	6.7	11.3	9.0	SD	1.4	4.4	2.3

+; check variety

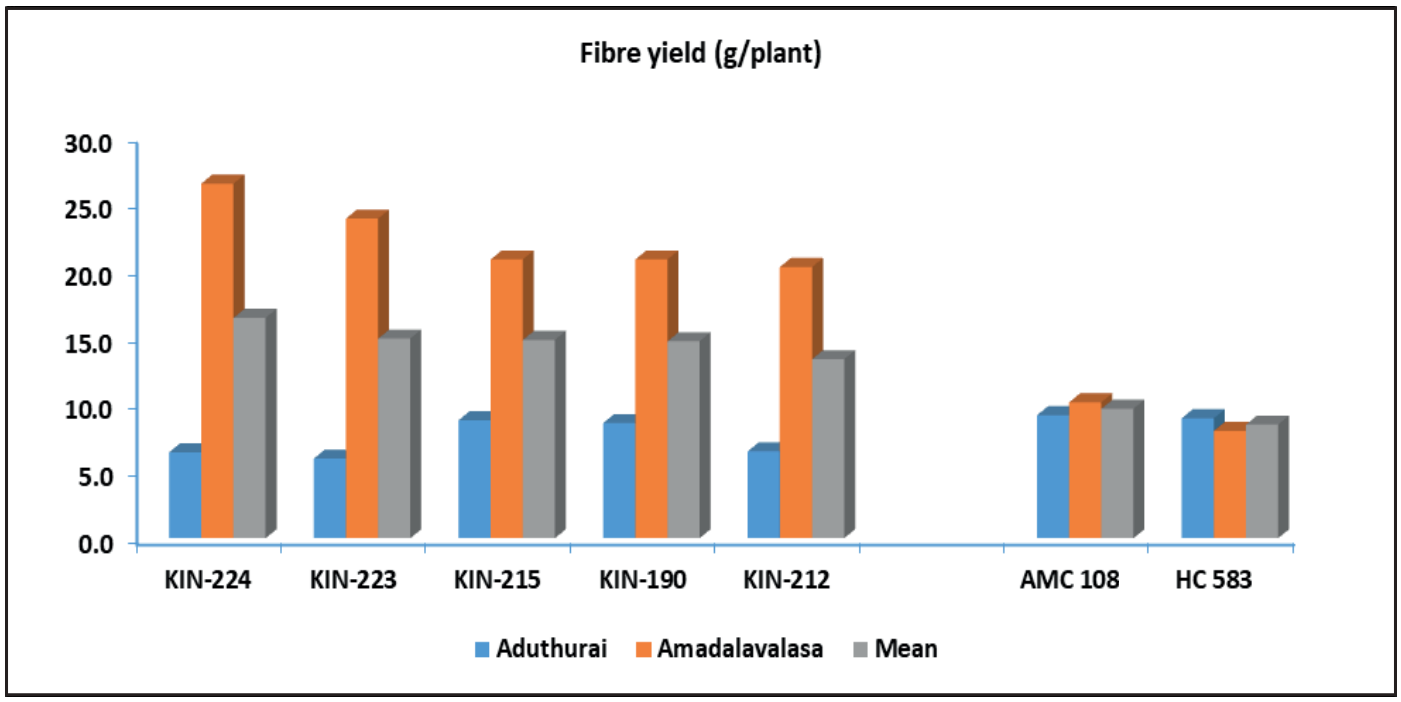


Figure 1.4 Fibre yield (g/plant) of best five H. cannabinus accessions over two locations

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) 2.3: NHP with *C. olitorius* jute - Station trial of F_7 population

This year, the F_7 progenies of different cross combinations along with two check varieties (JRO 524 and JRO 204) were evaluated in three centres, *viz.*, Coochbehar, Kalyani and Katihar. Results are summarised in table 1.5.

Coochbehar: Data was taken at 120 DAS. Plant height of 16 F_7 progenies ranged from 245-287 cm with a mean of 270±12.5 cm. Three progenies recorded superior performance over better check JRO 204 (284 cm) for plant height. Mean basal diameter was recorded as 1.53±0.10 cm. Fibre yield ranged from 20.5 to 29.8 q/ha with an average of 25.3±2.9 q/ha. Progenies from six cross combinations exceeded better check JRO 524 (26.2 q/ha) for fibre yield.

Kalyani: In this location, observations were recorded at 140 DAS. Plant height of 16 F_7 progenies varied from 333-430 cm with an average of 377±30.5 cm. Eight progenies were taller than better check JRO 204 (369 cm) for plant height. Average basal diameter of the progenies was 1.77±0.20 cm. Green biomass/plant ranged from 268.0 g to 565.0 g and mean was 420.3±77.9. Average fibre yield/plant was 21.6±4.3 g and ranged from 13.8 to 30.4 g/plant. The cross combination OIJ-013 X JRO 204 recorded highest yield (30.4 g/plant) over the better check JRO 524 (22.4 g/plant).

Katihar: In this location, observations were recorded at 132 DAS. Plant height of 34 F_7 progenies varied from 268-350 cm with an average of 330±11.6 cm. Average basal diameter of the progenies was 1.52±0.11 cm. Average fibre yield was 13.6±1.0 q/ha and ranged from 10.9 to 16.4 q/ha.

Table 1.5 Performance of F_7 progenies of *C. olitorius* jute at different centres

Parentage	Cooch-behar	Kalyani	Katihar		
	Dry fibre yield (g/plant)	Dry fibre yield (g/plant)	Dry fibre yield (q/ha)	Parentage	Dry fibre yield (q/ha)
OIJ-013 x JRO 204	29.8	30.4	12.8	OIJ-198 x JRO 8432 -7	14.6
OIJ-158 x JRO 8432	24.1	18.7	16.4	OIN-702 x JRO 204 -10	15.3
OIJ-198 x JRO 8432	25.4	17.1	13.1	OIN-914 x JRO 8432 -8	14.3
OIN-702 x JRO 204	20.5	21.4	13.3	OIN-971 x JRO 524-4	13.9
OIN-702 x JRO 8432	26.6	22.6	10.9	OIN-97 x JRO 524-6	13.4
OIN-882 x JRO 204	28.3	19.3	14.6	OIN-1000 x JRO 524-6	13.0
OIN-882 x JRO 524	25.7	20.2	13.0	OIN-1000 x JRO 524-8	13.6
OIN-882 x JRO 8432	27.6	23.6	14.3	OIN-1000 x JRO 204 -2	13.9
OIN-911 x JRO 8432	29.5	17.6	12.7	OIN-1000 x JRO 204-4	12.8
OIN-914 x JRO 524	20.7	25.6	14.1	OIN-1000 x JRO 204-8	13.5
OIN-914 x JRO 8432	21.2	27.8	12.8	OIN-1000 x JRO 8432-5	13.4
OIN-939 X JRO 8432	25.4	23.9	13.6	OIN-1000 x JRO 8432-10	12.7
OIN-961 x JRO 524	27.2	23.6	13.8	OIN-1001 x JRO 204-5	12.6
OIN-961 x JRO 8432	22.7	13.8	13.9	OIN-1011 x JR0 524-2	12.1
OIN-971 x JRO 204	25.2	16.9	13.7	OIN-1066 x JRO 8432-4	13.4
01N-971 x JRO 8432	25.2	22.6	15.0	OIN-1066 x JRO 8432 -10	13.9
JRO 204+	25.4	18.2	22.4	OEX-35 x JRO 204-6	13.3
JRO 524+	26.2	22.4		OEX-35 x JRO 204-9	15.1
				JRO 8432+	14.4
Mean	25.3	21.6		Mean	13.6
SD	2.9	4.3		SD	1.0

+; check variety

NP(JB) 2.4: NHP with *C. olitorius* jute - Evaluation of F_6 progenies

The F_6 progenies of different cross combinations were evaluated in four centres, *viz.*, Coochbehar, Kalyani, Katihar and Kendrapara. Data was not received from Kendrapara centre. Summary of results are given in table 1.6.

Katihar: In this location, observations were recorded at 128 DAS. Plant height of 42 F_6 progenies varied from 266-374 cm with an average of 325±27.0 cm. Average basal diameter of progenies was 1.64±0.13 cm. Average fibre yield/plant was 11.4±2.3 g and the character was ranged from 7.2 to 17.8 g/plant. The three progenies surpassed better check JRO 204 (15.4 g/plant) for fibre yield.

Coochbehar: All the observations were recorded at 120 DAS. Plant height of thirteen F_6 progenies varied from 269-339 cm with a mean value of 299±20.5 cm. Average basal diameter and green weight were 1.97±0.23 cm and 250.4±44.1 g/plant, respectively. Fibre yield/plant varied from 12.3-18.7 g/plant with a mean of 16.0±2.3 g/plant. Six progenies recorded superior performance than better check variety JRO 204 (17 g/plant) for fibre yield.

Kalyani: Data was noted at 140 DAS. The eight F_6 progenies exhibited an average plant height of 405±20.1 cm with a range of 373-435 cm. Basal diameter varied from 1.79-1.99 cm with a mean of 1.88±0.08 cm. Average green weight was recorded as 407.5±78.4 g/plant. Fibre yield ranged between 18.6 to 29.0 g/plant with an

average of 23.1±3.8 g/plant. Progenies of four cross combinations recorded better fibre yield than variety JRO 524 (23.6 g/plant).

Table 1.6 Performance of F_6 progenies of *C. olitorius* jute at different centres

Katihar				Katihar			
Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)
OIN-17 x JRO 8432	344	1.68	15.8	OIN-421 x JRO 8432	300	1.56	10.8
OIN-17 x JRO 8432	374	1.64	12.1	OIN-421 x JRO 8432	302	1.56	10.3
OIN-17 x JRO 8432	362	1.68	13.3	OIN-421 x JRO 8432	294	1.46	9.4
OIN-17 x JRO 8432	370	1.82	16.5	OIN-421 x JRO 8432	306	1.48	9.9
OIN-17 x JRO 8432	350	1.74	13.2	OIN-421 x JRO 8432	334	1.56	12.2
OIN-17 x JRO 8432	372	1.68	12.2	OIN-421 x JRO 8432	332	1.74	11.1
OIN-17 x JRO 8432	360	1.54	11.6	OIN-421 x JRO 8432	330	1.56	12.0
OIN-17 x JRO 8432	302	1.64	9.5	OIN-421 x JRO 8432	336	1.56	11.1
OIN-17 x JRO 8432	266	1.52	10.3	OIN-421 x JRO 8432	332	1.64	10.8
OIN-17 x JRO 8432	306	1.50	7.3	OIN-40 x JRO 524	328	1.86	14.6
OIN-17 x JRO 8432	302	1.64	8.8	OIN-40 x JRO 524	294	1.68	9.6
OIN-17 x JRO 8432	314	1.58	9.4	OIN-40 x JRO 524	310	1.64	10.5
OIN-17 x JRO 8432	308	1.70	10.2	OIN-40 x JRO 524	302	1.42	8.4
OIN-421 x JRO 524	342	1.80	13.2	OIN-40 x JRO 524	302	1.38	8.5
OIN-17 x JRO 8432	374	1.72	12.0	OIN-471 x JRO 524	304	1.52	8.7
OIN-421 x JRO 524	354	1.86	12.3	OIN-471 x JRO 524	298	1.70	7.2
OIN-421 x JRO 524	348	1.62	11.5	OIN-471 x JRO 524	298	1.42	9.8
OIN-421 x JRO 524	346	1.72	12.9	OIN-471 x JRO 524	292	1.48	9.8
OIN-421 x JRO 524	352	1.74	12.4	OIN-471 x JRO 524	310	1.68	10.4
OIN-421 x JRO 524	316	1.84	14.3	JRO 8432+	373	1.91	14.7
OIN-656 x JRO 8432	326	1.90	17.8	JRO 204+	378	2.04	15.4
OIN-656 x JRO 8432	354	1.82	13.5	Mean	325	1.64	11.4
OIN-421 x JRO 8432	322	1.64	12.1	SD	27.0	0.13	2.3
Coochbehar				**Coochbehar**			
Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)
OIN-017 x JRO 8432	339	1.67	18.7	OIN-421 x JRO 524	288	1.87	14.0
OIN-022 x JRO 8432	312	2.01	17.8	OIN-508 x JRO 524	282	1.98	13.3
OIN-040 x JRO 524	311	1.99	17.2	OIN-656 x JRO 8432	272	2.24	13.1
OIN-060 x JRO 8432	292	2.27	16.0	OIJ-278 x JRO 524	269	2.26	12.3
OIN-113 x JRO 524	290	1.91	15.3	JRO 204*	309	1.88	17.0
OIN-113 x JRO 204	289	2.09	15.1	JRO 524*	303	1.53	16.4
OIN-113 x JRO 8432	318	1.89	18.4	Mean	299	1.97	16.0
OIN-471 x JRO 524	313	1.46	17.9	SD	20.5	0.23	2.3
OIN-421 x JRO 8432	317	2.00	18.4				

Kalyani				Kalyani			
Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	BD (cm)	Fibre yield (g/plant)
OIN-471 x JRO 524	405	1.83	23.8	OIN-421 x JRO 524	395	1.79	19.6
OIN-656 x JRO 8432	414	1.89	26.4	OIN-158 x JRO6432	415	1.90	18.6
OIN-17 x JRO 8432	435	1.99	29.0	JRO 524+	435	1.93	23.6
OIN-421 x JRO 8432	373	1.98	25.4	JRO 204+	377	1.77	20.4
OIN-40 x JRO 524	385	1.80	19.0	Mean	405	1.88	23.1
OIN-22 x JRO 8432	420	1.89	23.0	SD	20.1	0.08	3.8

+; check variety; BD: basal diameter

NP(JB) 2.5: NHP with *C. olitorius* jute-Evaluation of F_5 progenies

This year, the F_5 progenies of different cross combinations were evaluated in four centres, *viz.*, Katihar, Kendrapara, Kalyani and Nagaon. Data was not received from Katihar and Kendrapara centres. Results are summarised in table 1.7.

Kalyani: F_5 progenies of 42 cross combinations were tested in this location with checks JRO 524, JRO 8432 and JRO 204. Data was recorded at 140 DAS. Average plant height was recorded as 359±34.4 cm (range: 280-415 cm). Basal diameter ranged from 1.31-2.10 cm with a mean of 1.73±0.16 cm. Average green biomass of the progenies was recorded as 329.5±86.5 g/plant. Fibre yield/plant varied from 10.2 to 27.0 g with an average of 17.0±4.0 g. Five progenies surpassed better check JRO 524 (22.4 g/plant) for fibre yield.

Nagaon: All the observations were noted at 126 DAS. Plant height of twenty three F_5 progenies ranged from 230-330 cm with a mean of 278±31.6 cm. Mean basal diameter was recorded as 1.98±0.48 cm. A total of 50 single plant selections were made from these crosses based on plant height and basal diameter.

Evaluation of olitorius jute F_5 progenies at Kalyani

Evaluation of olitorius jute F_5 progenies at Nagaon

Table 1.7 Performance of F_5 progenies of *C. olitorius* jute at different centres

Parentage	Kalyani			Nagaon		
	Plant height (cm)	Basal diameter (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)
OIJ-054 x JRO 8432	345	1.78	13.4	OIN-112 x JRO 66	255	2.15
OIJ-054 x OIN-055	370	1.78	16.6	OIN-112 x JRO 8432	250	1.95
OIJ-054 x OIN-979	383	1.63	13.6	OIN-112 x JRO 128	230	1.75
OIJ-054 x OIN-993	400	2.10	27.0	OIN-112 x JRO 204	270	2.50
OIJ-054 x OEX-020	385	1.83	17.4	OIN-112 x JRO 524	245	2.00
OIJ-054 x OEX-030	368	1.63	15.0	JRO 204 x OIN 278	328	2.33
OIN-055 x JRO 524	378	1.77	17.2	JRO 524 x OIN 278	245	1.23
OIN-055 x JRO 8432	345	1.49	18.3	JRO 66 x OIN 278	330	2.70

Parentage	Kalyani			Nagaon		
	Plant height (cm)	Basal diameter (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)
OIN-055 x OIJ-054	355	1.65	13.0	OIN 66 x OIN 112	330	1.33
OIN-055 x OIN-979	375	1.93	16.1	OIN-111 x JRO 66	270	2.00
OIN-055 x OIN-993	288	1.79	18.6	OIJ-88 x JRO 204	267	1.47
OIN-055 x OEX-020	325	1.54	14.0	OIJ-88 x JRO 66	303	2.15
OIN-055 x OEX-030	280	1.55	14.6	OIJ-88 x JRO 128	260	3.10
OIN-979 x JRO 524	365	1.76	18.0	OIJ-88 x JRO 524	305	1.50
OIN-979 x JRO 8432	377	1.79	20.8	OIN-278 x JRO 524	300	2.10
OIN-979 x OIJ-054	335	1.75	12.8	OIN-278 x JRO 66	305	2.45
OIN-979 x OIN-055	360	1.75	16.0	OIN-471 x JRO 66	275	1.95
OIN-979 x OIN-993	290	1.79	14.2	OIN-22 x JRO 204	245	1.45
OIN-979 x OEX-020	390	1.63	14.6	OIN-22 x JRO 8432	298	2.05
OIN-979 x OEX-030	370	1.78	17.2	OIN-17 x JRO 524	280	2.60
OIN-993 x JRO 524	405	1.93	24.6	OIN-17 x JRO 8432	258	1.55
OIN-993 x JRO 8432	375	1.31	17.8	OIN-17 x JRO 204	317	1.73
OIN-993 x OIN-055	405	1.83	19.4	OIN-17 x JRO 128	235	1.50
OIN-993 x OIN-979	375	1.86	19.6	JRO 204+	274	1.60
OIN-993 x OEX-020	343	1.78	14.6	JRO 8432+	280	2.40
OIN-993 x OEX-030	365	1.99	21.7	Mean	278	1.98
OEX-020 x JRO 524	405	1.75	24.4	SD	31.6	0.48
OEX-020 x OIJ-054	315	1.73	12.6			
OEX-020 x OIN-993	365	1.83	14.6			
OEX-030 x JRO 524	335	1.65	14.6			
OEX-030 x JRO 8432	390	2.04	26.0			
OEX-030 x OIJ-054	285	1.79	14.0			
OEX-030 x OIN-055	365	1.58	15.0			
OEX-030 x OIN-979	330	1.38	10.2			
OEX-030 x OIN-993	383	1.72	16.0			
JRO 524 x OIJ-054	377	1.59	18.6			
JRO 524 x OIN- 055	325	1.78	19.4			
JRO 524 x OIN-993	335	1.68	10.5			
JRO 524 x OEX-020	385	1.87	24.0			
JRO 524 x OEX-030	325	1.79	17.0			
JRO 8432 x OIN-055	415	1.55	14.6			
JRO 8432 x OIN-979	380	1.65	16.8			
JRO 524+	375	1.78	22.4			
JRO 8432+	335	1.63	12.8			
JRO 204+	355	1.85	18.2			
Mean	359	1.73	17.0			
SD	34.4	0.16	4.0			

+; check variety

NP(JB) 2.6: NHP with *C. capsularis* jute-Evaluation of F_5 progenies

At Nagaon centre 23 F_5 progenies were evaluated for plant height and basal diameter. Plant height of the progenies ranged from 195-298 cm with a mean of 240±31.2 cm. Basal diameter was varied from 1.15 to 1.50 cm with a mean of 1.35±0.10 cm (Fig. 1.5). A total of 32 selections were made based on plant height and basal diameter.

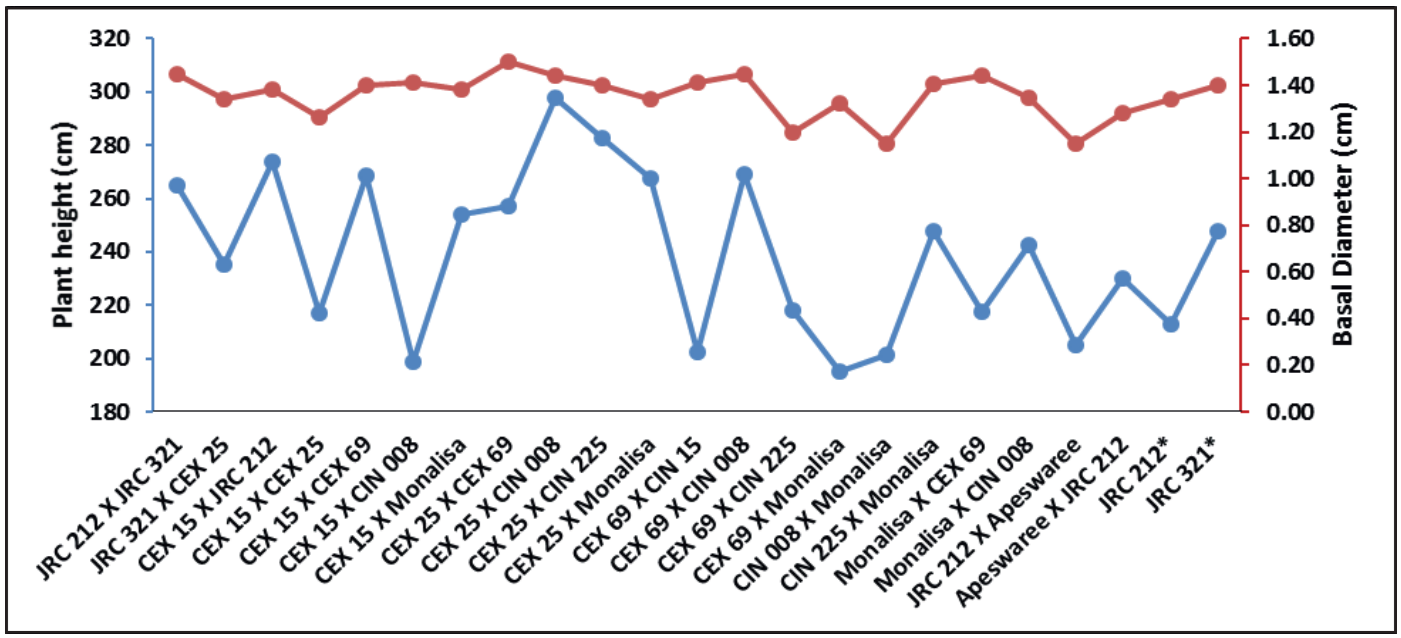


Figure 1.5: Performance of F_5 progenies of C. capsularis jute at Nagaon centre

NP(JB) 2.7: NHP with *C. capsularis* jute-Evaluation of F_4 progenies

This year, the F_4 progenies of different cross combinations were evaluated in two centres, *viz.*, Katihar and Nagaon. Results are summarised in table 1.8.

Katihar: F_4 progenies of 21 cross combinations were tested in this location with checks JRC 517 and JRC 698. Average plant height was recorded as 234±17.2 cm (range: 202-254 cm). Basal diameter ranged from 1.46-1.90 cm with a mean of 1.73±0.13 cm. Fibre yield/plant varied from 6.5 to 11.3 g with an average of 8.3±1.3 g.

Nagaon: Observations were recorded at 126 DAS. Plant height of six F_4 progenies ranged from 215-257 cm with a mean of 234±16.9 cm. Mean basal diameter was recorded as 1.33±010 cm. A total of 14 plants were selected from the crosses based on plant height and basal diameter.

Evaluation of capsularis jute F_4 progenies at Katihar

Table 1.8 Performance of F_4 progenies of *C. capsularis* jute at different centres

Parentage	Katihar			Nagaon		
	Plant height (cm)	Basal diameter (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)
CIN-19 x KTC-1	216	1.54	7.3	JRC 212 x CEX 15	253	1.40
CIN-19 x KTC-1	222	1.68	7.5	JRC 321 x CEX 25	235	1.27

Parentage	Katihar			Nagaon		
	Plant height (cm)	Basal diameter (cm)	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)
CIN-19 x KTC-1	252	1.60	9.2	CEX 15 x JRC 212	223	1.42
CIN-19 x KTC-1	206	1.90	9.6	CEX 15 x CEX 25	215	1.24
CIN-19 x KTC-1	248	1.64	8.6	CIN 008 x CEX 225	257	1.42
JRC 517 x CIN-03	242	1.78	8.1	CIN 008 x Monalisa	226	1.22
CIN-07 x KTC-1	214	1.86	7.6	JRC 517+	230	1.12
CIN-07 x KTC-1	228	1.88	10.3	JRC 698+	245	1.26
CIN-07 x KTC-1	246	1.82	7.1	Mean	234	1.33
CIN-07 x KTC-1	252	1.66	7.5	SD	16.9	0.10
CIN-03 x KTC-1	220	1.66	8.3			
KTC-1 x CIN-03	206	1.62	7.3			
KTC-1 x CIN-03	244	1.90	8.0			
CIN-14 x KTC-1	254	1.86	8.1			
CIN-14 x KTC-1	242	1.88	7.0			
CIN-14 x KTC-1	244	1.84	10.9			
CIN-14 x KTC-1	244	1.72	7.5			
CIJ-26 x KTC-1	250	1.62	8.3			
CIJ-26 x KTC-1	244	1.72	11.3			
CIJ-26 x KTC-1	228	1.70	9.0			
CIJ-26 x KTC-1	202	1.46	6.5			
JRC 517+	245	1.89	8.9			
JRC 698+	233	1.67	8.9			
Mean	234	1.73	8.3			
SD	17.2	0.13	1.3			

+; check variety

NP(JB) 2.8: NHP with *C. olitorius* jute - Evaluation of F_4 progenies

The F_4 progenies of different cross combinations were evaluated in three centres, *viz.*, Kalyani, Katihar and Rahuri. A summary of results is provided in table 1.9.

Kalyani: Data was recorded at 140 DAS. The 35 F_4 progenies exhibited an average plant height of 359±25.8 cm with a range of 290-400 cm. Basal diameter varied from 1.55-1.92 cm with a mean of 1.75±0.09 cm. Average green weight was recorded as 282.7±39.1 g/plant. Fibre yield ranged between 11.4 to 24.4 g/plant with an average of 17.3±2.7 g/plant. Four progenies recorded better fibre yield than variety JRO 204 (20.0 g/plant).

Katihar: All the observations were noted at 128 DAS. A total of 12 F_4 progenies were tested in this location with checks JRO 204 and JRO 8432. Average plant height was recorded as 302±16.3 cm (range: 268-322 cm). Basal diameter ranged from 1.16-1.70 cm with a mean of 1.39±0.15 cm. Fibre yield/plant varied from 4.7 to 13.4 g with an average of 8.8±2.8 g. The F_4 progeny of cross OIJ-23 x JRO 8432 (13.4 g/plant) performed better than check JRO 204 (12.9 g/plant) for fibre yield.

Evaluation of olitorius jute F_4 progenies at Katihar

Rahuri: In this centre, observations were recorded at 144 DAS. The average plant height of 17 F_4 progenies was 305±22.1 cm (range: 261-359 cm). Eleven progenies found taller than better check JRO 204 (298 cm). Basal diameter varied from 1.75-2.29 cm with a mean of 2.02±0.13 cm.

Table 1.9 Performance of F_4 progenies of *C. olitorius* jute at different centres

Kalyani		Rahuri			Katihar	
Parentage	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)	Parentage	Fibre yield (g/plant)
OIJ-03 x JRO 204	15.6	OIJ-23 x JRO 524	312	2.02	OIN-07 x JRO 204	4.7
OIJ-03 x JRO 524	16.0	OIJ-23 x OIJ-27	318	2.20	OIN-24 x JRO 204	5.4
OIJ-03 x OIJ-07	15.0	OIJ-23 x OIJ-28	285	1.95	OIN-24 x JRO 204	7.0
OIJ-03 x OIN-23	18.4	OIJ-27 x JRO 524	292	1.75	OIN-24 x JRO 204	6.4
OIJ-03 x OIN-46	17.6	OIJ-27 x JRO 204	311	1.88	OIN-24 x JRO 204	7.5
OIJ-07 x JRO 204	18.2	OIJ-27 x OIJ-23	304	2.11	OIJ-23 x JRO 8432	10.8
OIJ-07 x JRO 524	15.0	OIJ-27 x OIJ-28	322	2.09	OIJ-23 x JRO 8432	8.2
OIJ-07 x OIN-24	23.6	OIJ-28 x OIJ-23	318	2.09	OIJ-23 x JRO 8432	8.6
OIJ-07 x OIN-46	20.4	OIJ-28 x OIJ-27	291	1.94	OIJ-23 x JRO 8432	13.4
OIN-10 x JRO 204	18.2	JRO 524 x OIJ-27	328	1.89	Tarun x OIJ-29	11.9
OIN-10 x JRO 524	16.8	JRO 524 x OIJ-28	261	2.29	Tarun x OIJ-29	12.1
OIN-10 x OIJ-03	16.0	JRO 524 x OIJ-23	281	1.85	Tarun x OIN-56	9.4
OIN-10 x OIN-46	21.4	JRO 524 x JRO 204	307	2.07	JRO 8432	11.4
OIN-23 x JRO-204	17.4	JRO 204 x OIJ-28	359	2.03	JRO 204	12.9
OIN-23 x JRO 524	18.6	JRO 204 x OIJ-27	286	2.06	Mean	8.8
OIN-23 x OIJ -07	15.0	JRO 204 x OIJ-23	306	2.09	SD	2.8
OIN-23 x OIN-46	18.4	JRO 204 x JRO 524	309	1.98		
OIN-24 x JRO 204	16.0	JRO 524+	296	1.82		
OIN-24 x JRO 524	21.8	JRO 204+	298	1.86		
OIN-24 x OIJ-03	16.8	Mean	305	2.02		
OIN-24 x OIJ-07	14.2	SD	22.1	0.13		
OIN-24 x OIN-10	18.8					
OIN-24 x OIN-39	17.8					
OIN-24 x OIN-46	24.4					
OIN-39 x JRO 204	20.0					
OIN-39 x JR 524	17.4					
OIN-39 x OIJ-03	15.6					
OIN-39 x OIJ-07	17.8					
OIN-39 x OIN-23	17.2					
OIN-39 x OIN-46	15.8					
OIN-46 x JRO 204	13.8					
OIN-46 x JRO 524	13.8					
OIN-46 x OIJ-03	16.8					
OIN-46 x OIJ-07	11.4					

Kalyani		Rahuri			Katihar	
Parentage	Fibre yield (g/plant)	Parentage	Plant height (cm)	Basal diameter (cm)	Parentage	Fibre yield (g/plant)
OIN-46 x OIN-39	16.2					
JRO 204+	20.0					
JRO 524+	15.6					
Mean	17.3					
SD	2.7					

+; check variety

NP(JB) 2.9: NHP with *C. olitorius* jute-Evaluation of F_3 progenies

Twenty F_3 progenies were evaluated at Rahuri centre. Plant height of the progenies ranged from 292-346 cm with an average of 313±16.5 cm (figure 1.6). Nineteen progenies found taller than best check JRO 524 (292 cm). Basal diameter varied from 1.78-2.31 cm with a mean of 2.04±0.16 cm.

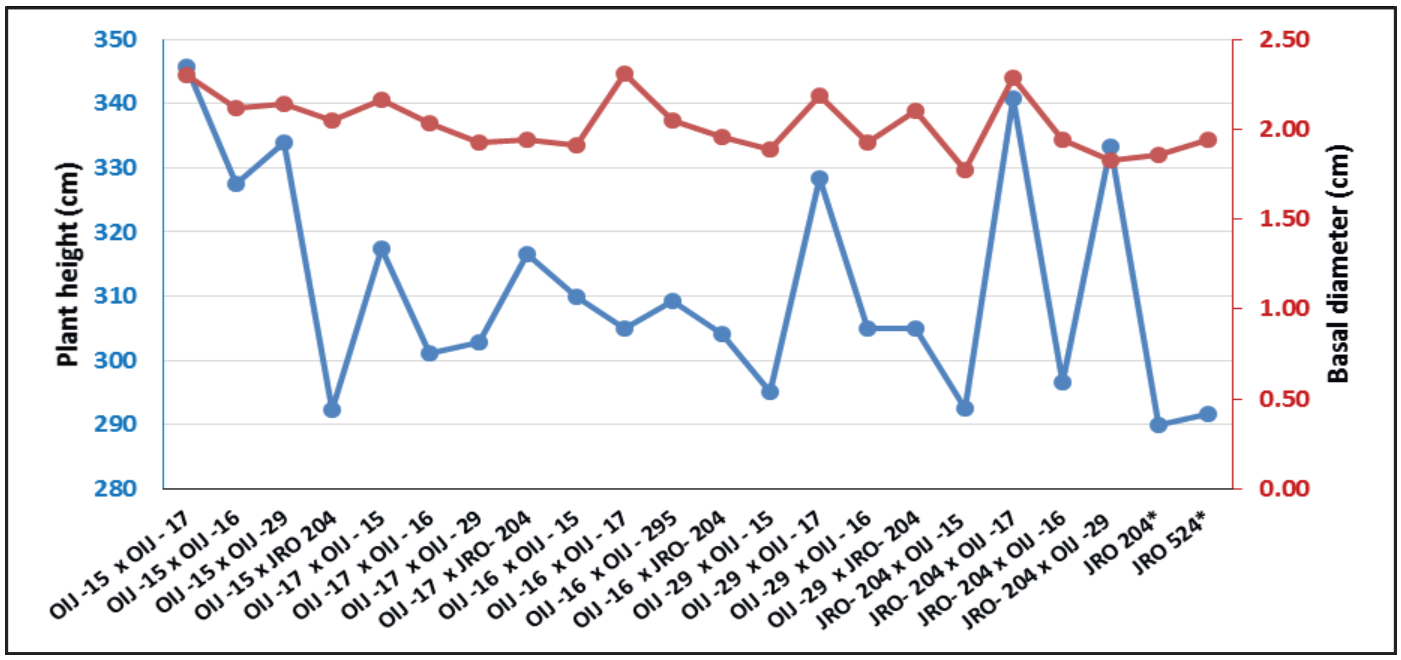


Figure 1.6: Performance of F_3 progenies of C. olitorius jute at Rahuri centre

NP(JB) 2.10: NHP with *C. olitorius* jute-Evaluation of F_1 hybrids

The F_1 hybrids of different cross combinations were evaluated in two centres, *viz.*, Kalyani and Coochbehar. A summary of results is provided in table 1.9.

Kalyani: All the observations were noted at 140 DAS. The F_1 hybrids exhibited an average plant height of 366±20.0 cm with a range of 330-403 cm. Basal diameter varied from 1.29-2.02 cm with a mean of 1.69±0.16 cm. Average green weight was recorded as 298.1±56.8 g/plant. Fibre yield ranged between 12.2 to 26.4 g/plant with an average of 18.2±3.5 g/plant.

Coochbehar: In this centre, observations were recorded at 87 DAS. Average green biomass per plant was 135.2±20.8 g (range: 104-170 g). Fibre yield ranged from 7.2-11.5 g/plant with an average of 9.3±1.2 g/plant. Thirteen F_1 hybrids exhibited higher fibre yield/plant than both the check varieties JRO 204 and JRO 524 (9.1 g).

Table 1.9 Performance of F_1 hybrids of *C. olitorius* jute at different centres

Parentage	Kalyani				Coochbehar		
	Plant height (cm)	BD (cm)	Green weight (g/plant)	Fibre yield (g/plant)	Parentage	Green weight (g/plant)	Fibre yield (g/plant)
BCCO-115 x OIN-128	345	1.73	265.0	20.2	JRO 204 × OIN-90	158.0	10.4
BCCO-115 x BCCO 6	390	1.67	335.0	16.8	JRO 204 × OIN-101	156.5	11.0
BCCO-115 x OIN-133	376	1.54	340.0	22.6	JRO 204 × OIN-108	140.2	9.5
BCCO-115 x OIN-86	386	1.83	290.0	14.4	JRO 204 × OIN-111	138.8	9.6
BCCO-115 x OIN-122	368	1.76	280.0	18.0	JRO 204 × OIN-112	169.8	11.5
BCCO-105 x OIN-122	369	1.49	240.0	17.2	JRO 204 × OIN-114	140.9	9.8
BCCO-105 x OIN-86	384	1.82	355.0	15.8	JRO 204 × OIN-129	110.9	8.1
BCCO-105 x BCCO-115	362	1.69	265.0	20.5	JRO 204 × OIN-133	106.9	7.9
BCCO-105 x BCCO 6	349	1.87	345.0	22.2	JRO 204 × OIN-96	112.9	8.1
BCCO-105 x OIN-128	354	1.89	330.0	25.2	JRO 204 × OIN-104	159.1	10.7
BCCO-105 x OIN-133	364	1.73	280.0	16.2	JRO 524 × OIN-90	113.9	8.2
OIN-133 x OIN-122	375	1.83	415.0	26.4	JRO 524 × OIN-101	134.7	9.6
OIN-133 x OIN-128	390	1.65	310.0	16.2	JRO 524 × OIN-108	119.0	7.8
OIN-133 x OIN-86	387	1.87	445.0	16.8	JRO 524 × OIN-111	168.9	10.8
OIN-128 x OIN-122	395	1.43	268.0	17.0	JRO 524 × OIN-112	163.0	10.5
OIN-128 x OIN-86	330	1.29	210.0	12.2	JRO 524 × OIN-129	132.5	9.0
OIN-128 x BCCO 6	382	2.02	249.0	14.8	OIN-101 × OIN-90	111.7	8.2
BCCO 6 x OIN-86	345	1.69	280.0	20.0	OIN-104 × OIN-99	103.8	7.2
OIN-133 x BCCO 6	339	1.49	221.0	16.2	OIN-108 × OIN-97	118.9	8.4
OIN-122 x BCCO 6	375	1.59	260.0	17.2	OIN-112 × OIN-133	137.2	8.8
BCCO-104 x BCCO-105	367	1.81	260.0	16.4	OIN-101× OIN-111	146.6	9.4
BCCO-104 x BCCO 6	386	1.75	310.0	21.0	OIN-104× OIN-129	111.9	8.4
BCCO-104 x OIN-122	365	1.55	264.0	18.0	OIN-108× OIN-114	145.5	10.5
BCCO-104 x OIN-86	377	1.86	315.0	14.0	OIN-112× OIN-99	143.9	9.3
BCCO-104 x OIN-133	356	1.47	225.0	13.4	JRO 204+	140.7	9.1
BCCO-104 x OIN-128	365	1.72	280.0	21.0	JRO 524+	131.7	9.1
OIN-86 x OIN-122	378	1.79	295.0	20.2	Mean	135.2	9.3
BCCO-105 x BCCO-104	332	1.43	205.0	13.8	SD	20.8	1.2
OIN-133	375	1.76	330.0	16.2			
BCCO-115	369	1.43	240.0	14.8			
BCCO-105	337	1.64	405.0	25.2			
BCCO-104	392	1.79	365.0	20.2			
OIN-122	403	1.83	365.0	18.6			
BCCO 6	340	1.73	282.0	15.4			
OIN-86	340	1.83	294.0	18.4			
OIN-128	339	1.68	315.0	22.2			
JRO 204+	362	1.69	282.0	18.0			
JRO 524+	359	1.69	271.0	16.2			
Mean	366	1.69	298.1	18.2			
SD	20.0	0.16	56.8	3.5			

+; check variety, BD: basal diameter

NP(JB) 2.11: NHP with *C. capsularis* jute-Evaluation of F_1 hybrids

The F_1 hybrids of different cross combinations were evaluated in two centres, *viz.*, Kalyani and Coochbehar. A summary of results is provided in table 1.10.

Kalyani: Data was recorded at 140 DAS. The F_1 hybrids and their parents exhibited an average plant height of 328±25.3 cm with a range of 285-376 cm. Basal diameter varied from 1.29-2.15 cm with a mean of 1.72±0.18 cm. Average green weight was recorded as 407.6±61.2 g/plant. Fibre yield ranged between 13.6 to 30.6 g/plant with an average of 20.4±4.4 g/plant.

Coochbehar: All the observations were recorded at 87 DAS. Average green biomass per plant was recorded to be 148.1±12.9 g (range: 114.9-163.6 g). Fibre yield ranged from 8.2-10.9 g/plant with an average of 9.9±0.7 g/plant. Eight F_1 hybrids exhibited higher fibre yield per plant than best check JRC 517 (9.8 g).

Table 1.10 Performance of F_1 hybrids of *C. capsularis* jute at different centres

Parentage	Kalyani				Coochbehar		
	Plant height (cm)	BD (cm)	Green weight (g/plant)	Fibre yield (g/plant)	Parentage	Green weight (g/plant)	Fibre yield (g/plant)
BCCC-116 x BCCC-127	287	1.79	368.0	24.4	JRC 212 × CIN-101	150.3	10.1
BCCC-107 x JRC 321	335	1.96	418.0	24.4	JRC 212 × CIN-127	163.6	10.9
BCCC-116 x CIN-111	340	1.89	359.0	22.2	JRC 212 × CIN-107	149.6	10.2
BCCC-102 x CIN-115	327	1.79	300.0	17.0	JRC 517 × CIN-101	147.6	10.0
CIN-106 x CIN-115	305	1.72	349.0	13.6	JRC 517 × CIN-127	154.8	10.2
JRC 321 x CIN-106	323	1.89	310.0	20.6	JRC 517 × CIN-107	114.9	8.2
BCCC-127 x CIN-115	335	1.83	424.0	23.6	CIN-101 × CIN-123	156.0	10.3
BCCC-127 x JRC 321	355	1.69	410.0	22.8	CIN-101 × CIN-126	145.8	10.1
BCCC-116 x CIN-115	325	1.48	425.0	22.2	CIN-101 × CIN-106	144.6	9.5
BCCC-127 x CIN-106	365	1.77	339.0	16.8	CIN-101 × CIN-121	154.0	10.0
BCCC-107 x BCCC-102	335	1.68	385.4	23.0	JRC 517+	134.5	9.8
BCCC-107 x BCCC-127	345	1.76	470.0	30.6	JRC 212+	137.0	9.7
CIN-106 x CIN-111	315	1.29	385.0	16.8	Mean	148.1	9.9
BCCC-116 x CIN-106	338	1.63	336.0	17.6	SD	12.9	0.7
BCCC-102 x BCCC-127	336	1.87	380.0	24.6			
BCCC-116 x BCCC-102	365	1.83	480.0	24.6			
BCCC-102x CIN-111	335	1.79	411.0	26.0			
BCCC-127 x CIN-111	335	1.65	393.0	22.0			
BCCC-107 x CIN-111	300	1.83	460.0	17.0			
BCCC-116 x JRC 321	348	1.75	405.0	26.0			
CIN-115 x CIN-111	285	1.43	400.0	14.2			
BCCC-102 x JRC 321	376	2.15	529.0	26.0			
JRC 321 x CIN-111	355	1.89	551.0	19.6			
BCCC-102 x CIN-106	303	1.82	367.0	18.8			
BCCC-107 x CIN-106	311	1.73	355.0	17.5			
BCCC-107 x BCCC-116	364	1.47	532.0	20.8			
JRC 321 x CIN-115	337	1.83	427.0	17.0			
BCCC-107 x CIN-115	337	1.53	550.0	21.6			
BCCC-102 x BCCC-116	358	1.83	435.0	27.5			

Parentage	Kalyani				Coochbehar		
	Plant height (cm)	BD (cm)	Green weight (g/plant)	Fibre yield (g/plant)	Parentage	Green weight (g/plant)	Fibre yield (g/plant)
JRC 321+	305	1.69	360.0	15.7			
JRC 698+	340	2.11	365.0	20.2			
Mean	328	1.72	407.6	20.4			
SD	25.3	0.18	61.2	4.4			

+: check variety, BD: basal diameter

NP(JB) 2.12: NHP with *C. olitorius* & *C. capsularis* jute –Fresh crossing

Fresh crossing in *C. olitorius* jute

Coochbehar: This centre attempted 6 x 6 half-diallel mating design involving 6 parents (OIN-142, OIN-178, OIN-181, OIN-147, OIN-165, OIN-149) and F_0 seed of 15 crosses has been collected.

Kalyani: This centre has raised 16 crosses involving eight parents (OIN-156, OIN-163, OIN-164, BCCO 105, JRO 204, JRO 524, JRO 8432 and BCCO 6) and seed has been collected for further evaluation. Katihar and Kendrapara did not attempt any crossing.

Fresh crossing in *C. capsularis* jute: Katihar and Kendrapara did not attempt crossing.

NP(MB) 2.3: NHP with mesta - Evaluation of F_4 progenies of kenaf

At Aduthurai centre, 36 F_4 progenies were evaluated with check varieties HC 583 and AMC 108. Plant height of the progenies ranged from 167-303 cm and mean was 242±35.4 cm (Fig. 1.7). Mean basal diameter was 1.95±019 cm and ranged from 1.56-2.29 cm. Crop growth was stunted due to late sowing, hence data not recorded at Barrackpore centre.

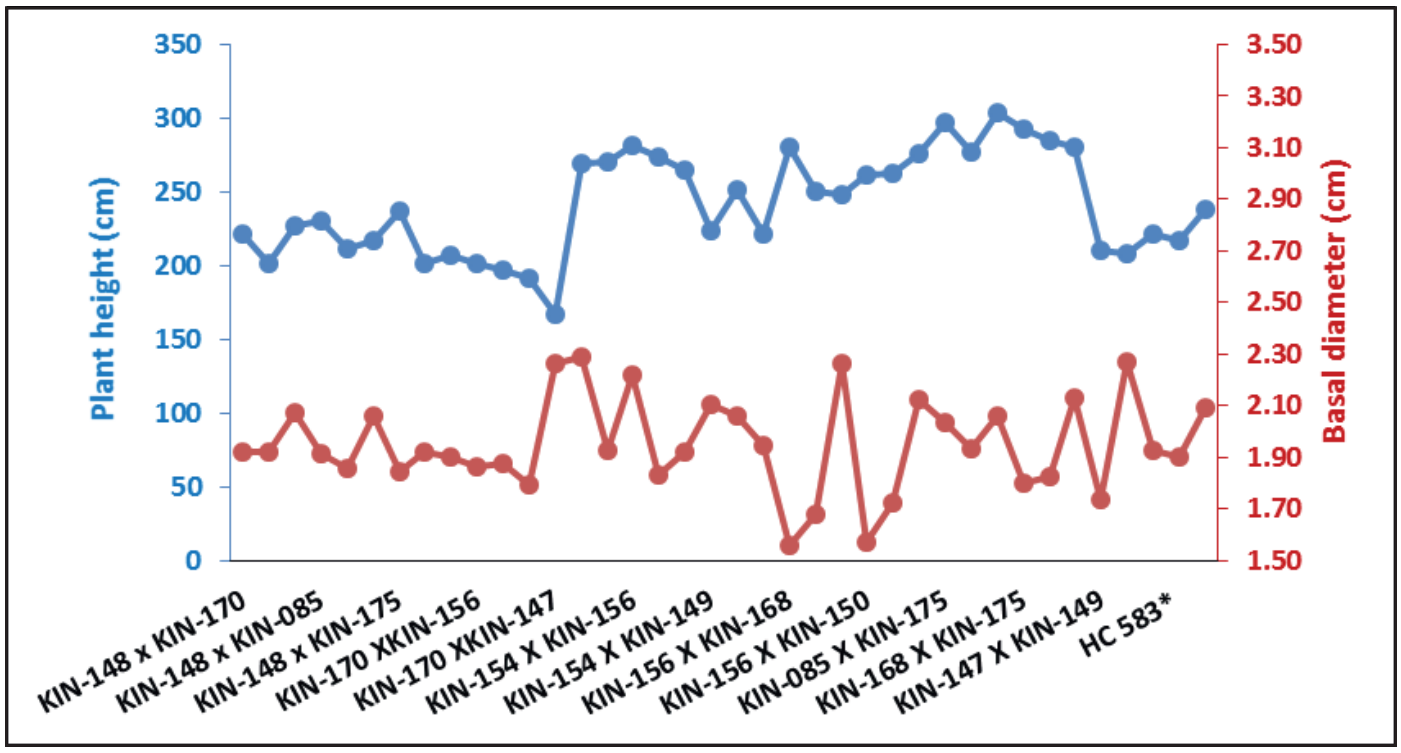


Figure 1.7: Performance of F_4 progenies of kenaf at Aduthurai centre

NP(MB) 2.4: NHP with mesta- Evaluation of F_1 hybrids of roselle

At Aduthurai centre, F_1 progenies of five crosses (AMV 5 x AS 80-27, AMV 5 x REX 27, AS-80-27 x REX-1, AS-80-27 x REX-27 and REX-27 x REX-1) were sown late. Hence, data was not recorded only generation advancement was carried out.

YIELD EVALUATION TRIALS

Jute

NP(JB) 5.48: IET with tossa jute (*C. olitorius*)

The trial was constituted with 16 test entries and two check varieties namely, JRO 204 and JRO 524 and conducted over six locations i.e., Coochbehar, Kalyani, Katihar, Kendrapara, Nagaon and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.11.

Coochbehar: Sowing of the trial was done on 11.05.2020 and the crop was harvested after 124 days on 12.09.2020. Significant difference was observed among the entries. Test entry BROJ-2 recorded highest fibre yield (29.69 q/ha) followed by JROBA-7 (28.34 q/ha), BROJ-1 (28.30 q/ha), JROP-6 (26.92 q/ha) and JROBA-6 (26.71 q/ha) which were statistically on par with best check JRO 524 (25.52 q/ha) for fibre yield.

Kalyani: The trial was sown on 24.04.2020 at this centre and harvested on 01.09.2020 when the crop was 130 days old. High significant difference was observed among entries. Test entry UBOJ-1 recorded highest fibre yield (44.03 q/ha) followed by NJ-7068 (43.81 q/ha) and RHRJ-1 (40.71 q/ha) which were statistically on par with best check JRO 204 (40.33 q/ha).

Table 1.11 IET with *C. olitorius* jute-2020 (fibre yield in q/ha)

Entry	Coochbehar	Kalyani	Katihar	Kendrapara	Nagaon	Rahuri	National average
BCCO-22	20.08	37.81	28.84	20.49	17.04	35.76	26.67
BCCO-24	21.76	32.86	31.53	17.18	23.22	38.61	27.53
BROJ-1	28.30	34.14	31.06	23.21	18.22	30.57	27.58
BROJ-2	29.69	34.20	37.72	24.07	24.19	40.34	31.70
JRO 204+	24.11	40.33	32.85	20.80	17.70	42.51	29.72
JRO 524+	25.52	40.08	28.14	17.51	20.07	36.44	27.96
JROBA-6	26.71	37.18	29.68	26.75	27.15	34.24	30.29
JROBA-7	28.34	37.79	27.15	18.20	27.70	31.81	28.50
JROCS-19-1	20.82	34.36	37.47	19.28	11.15	31.39	25.75
JROCS-19-2	24.82	31.95	25.17	24.48	18.37	35.80	26.77
JROP-6	26.92	39.53	27.34	22.05	26.89	37.21	29.99
JROP-7	23.73	36.05	28.22	18.55	22.11	41.35	28.34
NJ-7020	23.09	29.27	29.95	20.20	15.96	44.55	27.17
NJ-7068	26.63	43.81	34.43	13.60	23.22	47.38	31.51
NOJ 17-2	23.44	39.83	34.58	17.77	22.70	36.79	29.19

Entry	Coochbehar	Kalyani	Katihar	Kendrapara	Nagaon	Rahuri	National average
RHRJ-1	25.46	40.71	29.88	17.80	22.67	33.12	28.27
RHRJ-2	22.73	34.48	33.85	17.77	17.70	35.66	27.03
UBOJ-1	25.42	44.03	32.00	25.46	17.59	39.33	30.64
G. Mean	24.86	37.13	31.10	20.29	20.76	37.38	28.59
F test	*Sig.*	*HS*	*HS*	*HS*	*Sig.*	*HS*	*HS*
SEm±	1.82	1.73	0.48	1.53	3.08	2.01	0.79
$LSD_{p=0.5}$	5.24	4.98	1.39	4.40	8.86	5.77	2.20
CV (%)	12.70	8.09	2.69	13.06	25.73	9.30	11.72

+; check varieties,

Katihar: At this location sowing was done on 17.05.2020 and after 151 days of field duration harvesting was done on 15.10.2020. High significant difference was observed among entries. Test entry BROJ-2 recorded highest fibre yield (37.72 q/ha) followed by JROCS-19-1 (37.47 q/ha), NOJ-17-2 (34.58 q/ha), NJ-7068 (34.43 q/ha) and RHRJ-2 (33.85 q/ha) and were statistically on par with best check JRO 204 (32.85 q/ha).

Kendrapara: Sowing of the trial was done on 18.04.2020 at this location and harvesting was done after 141 days on 06.09.2020. Highly significant difference was observed among entries. Test entry JROBA-6 recorded significantly high fibre yield of (26.75 q/ha) over best check JRO 204 (20.80 q/ha) followed by UBOJ-1 (25.46 q/ha), JROCS-19-2 (24.48 q/ha), BROJ-2 (24.07 q/ha) and BROJ-1 (23.21 q/ha).

Nagaon: The field trial at this location was sown on 30.04.2020 and harvested on 02.09.2020 after 125 days. Highly significant difference was observed among entries. Test entry JROBA-7 (27.70 q/ha) recorded highest fibre yield followed by JROBA-6 (27.15 q/ha), JROP-6 (26.89 q/ha) and BROJ-2 (24.19 q/ha) over the best check JRO 524 (20.07 q/ha).

Rahuri: The trial was sown on 12.06.2020 at this centre and harvested on 28.09.2020 when the crop was 108 days old. Highly significant difference was observed among entries. Test entry NJ-7068 (47.38 q/ha) andNJ-7020 (44.55 q/ha) recorded high fibre yield over the best check JRO 204 (42.51 q/ha).

National average: Analysis of data at national level revealed significant differences among test entries. Test entry BROJ-2 recorded significantly high fibre yield (31.70 q/ha) than the best check JRO 204 (29.72 q/ha) followed by NJ-7068 (31.51 q/ha), UBOJ-1 (30.64 q/ha) and JROBA- 6 (30.29 q/ha).

NP(JB) 5.49: AVT-1 with tossa jute (*C. olitorius*)

The trial was constituted with 4 test entries and 2 check varieties namely JRO 204 and JRO 524. It was conducted over seven locations i.e., Barrackpore, Kalyani, Coochbehar, Katihar, Kendrapara, Nagaon and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.12.

Coochbehar: The trial was sown at this location on 02.05.2020 and harvested on 11.09.2020 after 132 days of field duration. Highly significant difference among entries was observed. Test entry JROP-4 recorded high fibre yield (29.17 q/ha) over best check JRO 204 (27.92 q/ha) followed by JROBA-5 (28.29 q/ha).

Barrackpore: The sowing date of the trial at this centre was 20.05.2020 and after 123 days of field duration it was harvested on 20.09.2020. No significant differences among entries were observed. Check variety JRO 524 recorded high fibre yield (29.02 q/ha) followed by NOJ-15-1 (28.44 q/ha).

Kalyani: The sowing date of the trial at this centre was 19.04.2020 and after 136 days of field duration it was harvested on 02.09.2020. Highly significant differences among entries were observed. Test entry JROBA-5 recorded significantly high fibre yield (36.80 q/ha) than the best check JRO 204 (31.20 q/ha) followed by JROP-4 (34.59 q/ha) and BCCO-20 (33.20 q/ha).

Katihar: Sowing at this location was done on 20.05.2020 and the crop was harvested on 25.09.2020 with field duration of 128 days. Highly significant difference among entries was observed. Test entry JROBA-5 recorded significantly high fibre yield (29.55 q/ha) over the best check JRO 204 (22.20 q/ha) followed by BCCO-20 (28.54 q/ha) and NOJ-15-1 (26.20 q/ha).

Kendrapara: The sowing date of the trial at this centre was 17.04.2020 and after 141 days of field duration it was harvested on 05.09.2020. Significant difference among entries was observed. Test entry JROP-4 recorded significantly high fibre yield (30.26 q/ha) over the best check JRO 204 (27.48 q/ha) followed by JROBA-5 (29.15 q/ha).

Nagaon: The trial was sown at this location on 22.05.2020 and harvested on 02.09.2020 after 103 days of field duration. Highly significant differences among entries were observed. Test entry JROBA-5 recorded significantly high fibre yield (30.99 q/ha) over the best check JRO 204 (27.37 q/ha) followed by JROP-4 (29.42 q/ha), NOJ-15-1 (29.38 q/ha) and BCCO-20 (28.44 q/ha).

Table 12 AVT-I with *olitorius* jute (fibre yield in q/ha)

Entry	Coochbehar	Barrackpore	Kalyani	Katihar	Kendrapara	Nagaon	Rahuri	National average
BCCO-20	25.74	25.36	33.20	28.54	20.38	28.44	26.24	26.84
JRO 204+	27.92	28.26	31.20	22.20	27.48	27.37	26.13	27.22
JRO 524+	23.94	29.02	26.31	25.09	25.19	26.18	28.13	26.27
JROBA-5	28.29	27.40	36.80	29.55	29.15	30.99	26.64	29.83
JROP-4	29.17	27.55	34.59	23.69	30.26	29.42	34.88	29.94
NOJ-15-1	24.48	28.44	28.32	26.20	24.73	29.38	28.17	27.10
G. Mean	26.59	27.67	31.74	25.88	26.20	28.63	28.36	27.87
F test	*HS*	*NS*	*HS*	*HS*	*Sig.*	*HS*	*HS*	*HS*
SEm±	0.50	0.98	0.80	0.27	1.85	0.62	0.79	0.36
$LSD_{p=0.5}$	1.52	-	2.42	0.82	5.56	1.86	2.39	1.01
CV (%)	3.79	7.10	5.06	2.09	14.08	4.31	5.60	6.83

+; check varieties,

Rahuri: Trial was sown on 23.06.2020 and after 97 days of field duration it was harvested on 28.09.2020. Highly significant difference among entries was observed. Test entry JROP-4 (34.88 q/ha) recorded significantly high fibre yield than check variety JRO 524 (28.13 q/ha) followed by NOJ-15-1 (28.17 q/ha).

National average: Highly significant difference among entries was observed when data was analyzed over the locations. Test entry JROP-4 (29.94 q/ha) recorded significantly high fibre yield than check variety JRO 204 (27.22 q/ha) followed by JROBA-5 (29.83 q/ha).

NP(JB) 5.50: AVT-II with tossa jute (*C. olitorius*)

The trial was constituted with four test entries and two check varieties namely, JRO 524 and JRO 204. It was conducted over seven locations such as Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara, Nagaon and Rahuri. Location wise results were discussed below and fibre yield data are presented in table 1.13.

Barrackpore: The trial was sown on 20.05.2020 and harvested on 20.09.2020 at the crop age of 123 days. Non-significant difference among varieties was observed. Check varieties JRO 524 (29.02 q/ha) and JRO 204 (28.82 q/ha) recorded high fibre yield followed by JROP-2 (28.03 q/ha) and JROBA-3 (27.33 q/ha).

On the basis of analysis of data over years, again check variety JRO 524 (32.82 q/ha) recorded highest fibre yield followed by test entry NJ-7082 (32.37 q/ha). Difference among entries was not significant.

Coochbehar: The trial was sown at this location on 04.05.2020 and harvested on 11.09.2020 after 130 days. Highly significant difference among entries was observed. Test entry JROBA-4 (29.21 q/ha recorded highest fibre yield followed JROBA-3 (28.81 q/ha) and NJ-7082 (28.10 q/ha).

Considering mean performance over years again test entries JROBA-4 (33.00 q/ha), NJ-7082 (30.98 q/ha) and JROBA-3 (30.97 q/ha) out yielded best check JRO 524 (27.74 q/ha) for fibre yield. Highly significant differences among entries were observed.

Kalyani: The trial was sown on 29.04.2020 and harvested on 04.09.2020 at the crop age of 128 days. Highly significant difference among entries was observed. Test entry JROP-2 (36.50 q/ha) recorded highest fibre yield followed by JROBA-3 (36.19 q/ha) and check variety JRO 204 (35.80 q/ha). These test entries were on par with superior check JRO 204.

As per analysis of mean performance over years, test entry JROBA-3 (35.38 q/ha) out yielded the best check JRO 204 (35.24 q/ha) but statistically on par with each other. Entries were highly significant.

Katihar: At this centre sowing was done on 20.05.2020 and after 129 days the crop was harvested on 26.09.2020. Highly significant differences among entries were observed. Check variety JRO 524 (29.31 q/ha) recorded highest fibre yield followed by test entries NJ-7082 (26.36 q/ha) and JROP-2 (25.76 q/ha).

On the basis of pooled analysis over years, test entries NJ-7082 (29.80 q/ha) and JROP-2 (29.65 q/ha) out yielded the best check JRO 524 (29.47 q/ha) for fibre yield. Difference among entries was highly significant.

Kendrapara: The trial was sown at this location on 17.04.2020 and harvested on 05.09.2020 after 141 days. Significant differences among entries were observed. Test entry JROBA-4 (31.25 q/ha) was best performer for fibre yield followed by JROP-2 (30.02 q/ha), NJ 7082 (26.35 q/ha) and check JRO 524 (25.06 q/ha) at this location.

Considering mean performance over years, again test entries JROBA-4 (29.35 q/ha) and JROP-2 (26.06 q/ha) out yielded best check JRO 524 (26.04 q/ha) for fibre yield. Highly significant differences among entries were observed.

Nagaon: Sowing at this location was done on 03.05.2020 and after 126 days of field duration harvesting was done on 06.09.2020. No significant differences among entries were observed. Test entry NJ-7082 (29.86 q/ha) out yielded best check JRO 524 (29.71 q/ha) followed by JROBA-3 (29.71 q/ha).

As per analysis of mean performance over years, check variety JRO 204 (35.85 q/ha) was the best performer followed by test entries JROBA-4 (35.46 q/ha) and JROP-2 (35.39 q/ha) but statistically on par with each other. Entries were highly significant.

Table 13: Pooled data of AVT-I (2018) and AVT-II (2020) with *C. olitorius* jute (fibre yield in q/ha)

Entry	Barrackpore			Coochbehar			Kalyani			Katihar			Kendrapara			Naogaon			Rahuri			National average		
	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean
JRO 204+	34.24	28.82	31.53	31.94	20.06	26.00	34.67	35.80	35.24	33.00	25.48	29.24	26.66	24.42	25.54	42.50	29.19	35.85	20.60	28.50	24.55	31.94	27.47	29.71
JRO 524+	36.61	29.02	32.82	27.50	27.98	27.74	33.22	27.07	30.15	29.62	29.31	29.47	27.01	25.06	26.04	40.06	29.71	34.89	18.99	28.78	23.89	30.43	28.13	29.28
JROBA-3	34.41	27.33	30.87	33.12	28.81	30.97	34.56	36.19	35.38	33.71	21.35	27.53	25.32	21.53	23.43	40.95	29.71	35.33	24.57	34.45	29.51	32.38	28.48	30.43
JROBA-4	32.87	27.28	30.08	36.78	29.21	33.00	34.38	34.78	34.58	28.49	24.46	26.48	27.45	31.25	29.35	43.33	27.59	35.46	29.67	29.96	29.82	33.28	29.22	31.25
JROP-2	34.54	28.03	31.29	34.44	19.80	27.12	32.34	36.50	34.42	33.54	25.76	29.65	22.09	30.02	26.06	42.79	27.99	35.39	18.74	30.15	24.45	31.21	28.32	29.77
NJ-7082	37.66	27.07	32.37	33.86	28.10	30.98	35.17	27.46	31.32	33.24	26.36	29.80	21.93	26.35	24.14	30.75	29.86	30.31	25.61	36.22	30.92	31.17	28.77	29.97
G.Mean	35.06	27.93	31.50	32.94	25.66	29.30	34.06	32.97	33.52	31.93	25.45	28.69	25.08	26.44	25.76	40.06	29.01	34.54	23.03	31.34	27.19	31.74	28.40	30.07
F test	*HS*	*NS*	*NS*	*HS*	*HS*	*HS*	*NS*	*HS*	*HS*	*HS*	*HS*	*HS*	*Sig.*	*HS*	*HS*	*HS*	*NS*	*HS*	*HS*	*HS*	*HS*	*Sig.*	*HS*	*HS*
SEm±	0.65	1.16	0.66	0.57	0.29	0.32	0.75	1.00	0.62	0.28	0.39	0.24	1.29	1.72	1.07	1.27	1.63	1.03	0.64	0.88	0.54	0.32	0.43	0.27
LSD $_{p=0.5}$	1.97	-	-	1.71	0.87	392.00	-	3.02	1.81	0.82	1.17	0.69	3.91	5.17	3.11	3.82	-	2.98	1.93	2.66	1.57	0.90	1.20	0.75
CV (%)	3.72	8.30	5.98	3.45	2.26	30.80	4.40	6.08	5.28	1.71	3.05	2.34	10.34	12.98	11.81	6.33	11.20	8.44	5.56	5.63	5.67	5.37	7.96	6.66

+; check varieties,

Rahuri: Sowing at this location was done on 23.06.2020 and after 97 days of field duration harvesting was done on 28.09.2020. Highly significant differences among entries were observed. Test entries NJ-7082 (36.22 q/ha), JROBA-3 (34.45 q/ha), JROP-2 (30.15 q/ha) and JROBA-4 (29.96 q/ha) recorded significantly high fibre yield over best check JRO 204 (28.78 q/ha).

On the basis of pooled analysis over years, test entries NJ-7082 (30.92 q/ha), JROBA-4 (29.82 q/ha) and JROBA-3 (29.51 q/ha) significantly out yielded the best check JRO 204 (24.55 q/ha) for fibre yield. Highly significant differences among entries were observed.

AVT-II with olitorius jute at Rahuri

National Average: In 2018 under AVT-I trial significant difference among entries was observed and based on pooled data test entry JROBA-4 (33.28 q/ha) out yielded the best check JRO 204 (31.94 q/ha) followed by JROBA-3 (32.38 q/ha), JROP-2 (31.21 q/ha) and NJ-7082 (31.17 q/ha) were statistically on par with best check JRO 204.

In 2020 under AVT-II trial highly significant differences among entries were revealed when compared at national level pooling over all locations. Test entry JROBA-4 again recorded highest fibre yield (29.22 q/ha) followed by NJ-7082 (28.77 q/ha), JROBA-3 (28.48 q/ha), JROP-2 (28.32 q/ha) and check variety JRO 524 (28.13 q/ha).

Considering pooled analysis over locations and years mean (grand mean) highly significant difference among entries was recorded. Again test entry JROBA-4 recorded significantly high fibre yield (31.25 q/ha) over the best check JRO 204 (29.71 q/ha) followed by JROBA-3 (30.43 q/ha) and NJ-7082 (29.97 q/ha).

NP(JB) 5.51: IET with white jute (*C. capsularis*)

This trial was constituted with eight test entries and two check varieties namely JRC 517 and JRC 698 and conducted over five locations i.e., Coochbehar, Kalyani, Katihar, Kendrapara and Nagaon. Location wise results are discussed below and fibre yield data are presented in table 1.14.

Coochbehar: The trial was sown on 15.05.2020 at this centre and harvested on 16.09.2020 when the crop was 124 days old. Significant differences among entries were observed. Test entry UBCJ-2 (32.93 q/ha) recorded highest fibre yield followed by best check JRC 517 (31.21 q/ha), JRCP-9 (30.14 q/ha) and BCCC-16 (29.82 q/ha).

Kalyani: Sowing was done at this location on 24.04.2020 and after 130 days of field duration, harvesting was done on 01.09.2020. Highly significant differences among entries were revealed. Test entry JRCP-8 (39.15 q/ha) recorded high fibre yield followed by NCJ-16-53-1 (39.12 q/ha), best check JRC 698 (39.04 q/ha), JRCJ-18 (38.69 q/ha) and BCCC-17 (38.11 q/ha). Except JRCJ-19 all entries were statistically on par with best check JRC 698.

Katihar: Sowing at this location was done on 03.05.2020 and the crop was harvested on 10.10.2020 after 160 days of crop duration. Highly significant difference among entries was observed. Best check JRC 698 (35.88 q/ha) recorded highest fibre yield followed by test entry BCCC-17 (35.58 q/ha), JRCP-8 (35.14 q/ha), JRCP-9 (34.07 q/ha) and JRCJ-18 (32.33 q/ha).

Table 1.14 IET with *C. capsularis* jute-2020 (fibre yield in q/ha)

Entry	Coochbehar	Kalyani	Katihar	Kendrapara	Nagaon	National average
BCCC-16	29.82	37.62	31.83	25.17	25.69	30.02
BCCC-17	28.49	38.11	35.58	24.48	25.78	30.49
JRC 517+	31.21	34.36	29.51	26.91	31.94	30.79
JRC 698+	28.27	39.04	35.88	20.37	30.28	30.77
JRCJ-18	26.71	38.69	32.33	21.59	29.78	29.82
JRCJ-19	26.74	25.41	30.37	15.10	20.06	23.53
JRCP-8	25.54	39.15	35.14	28.10	32.28	32.04
JRCP-9	30.14	36.89	34.07	30.53	38.33	33.99
NCJ-16-53-1	27.66	39.12	30.63	28.63	32.76	31.76
UBCJ-2	32.93	36.55	31.62	22.86	24.19	29.63
G. Mean	28.75	36.49	32.70	24.37	29.11	30.28
F test	Sig.	HS	HS	HS	HS	HS
SEm±	1.45	1.10	0.45	1.78	2.42	0.71
$LSD_{p=0.5}$	4.30	3.27	1.32	5.29	7.18	1.99
CV (%)	8.73	5.22	2.36	12.66	14.39	9.05

+; check varieties,

Kendrapara: At this location the trial was sown on 15.04.2020 and harvested on 05.09.2020 after 143 days of duration. Highly significant differences among entries were revealed. Test entry JRCP-9 (30.53 q/ha) recorded highest fibre yield than best check JRC 517 (26.91 q/ha) followed by NCJ-16-53-1 (28.63 q/ha), JRCP-8 (28.10 q/ha), BCCC-16 (25.17 q/ha) and other test entries were statistically on par with best check JRC 517.

IET with capsularis jute at Kendrapara

Nagaon: The trial was sown on 21.04.2020 at this centre and harvested on 27.08.2020 when the crop was 128 days old. Highly significant differences among entries were revealed. Test entry JRCP-9 recorded 38.33 q/ha fibre yield followed by NCJ-16-53-1 (32.76 q/ha) and JRCP-8 (32.28 q/ha). Except JRCJ-19 (20.06 q/ha), all test entries were statistically on par with best check JRC 517.

National average: Considering mean performance over locations, highly significant differences were recorded among the entries. Test entry JRCP-9 (33.99 q/ha) recorded highest fibre yield followed by JRCP-8 (32.04 q/ha), NCJ-16-53-1 (31.76 q/ha) and check variety JRC 517 (30.79 q/ha).

NP(JB) 5.52: AVT-I with white jute (*C. capsularis*)

The trial was constituted with 4 test entries and 2 check varieties namely JRC 517 and JRC 698. It was conducted over six locations i.e., Barrackpore, Kalyani, Coochbehar, Katihar, Kendrapara and Nagaon. Location wise results are discussed below and fibre yield data are presented in table 1.15.

Coochbehar: The trial was sown at this location on 13.05.2020 and harvested on 15.09.2020 after 125 days of sowing. Highly significant difference among entries was observed. Best check JRC 698 recorded high fibre yield (32.80 q/ha) followed by JRCP-6 (32.78 q/ha), JRCP-7 (31.91 q/ha) and BRCJ-5 (31.77 q/ha).

Barrackpore: The sowing date of the trial at this centre was 20.05.2020 and after 124 days of field duration it was harvested on 21.09.2020. No significant differences among entries were observed. Test entry JRCP-7 recorded high fibre yield (28.65 q/ha) followed by BRCJ-5 (27.62 q/ha), JRCP-6 (26.43 q/ha) and check variety JRC 698 (26.34 q/ha). All test entries were statistically on par with best check JRC 698.

AVT-I with capsularis jute at Barrackpore

Table 15: AVT-I with *C. capsularis* jute-2020 (fibre yield q/ha)

Entry	Coochbehar	Barrackpore	Kalyani	Katihar	Kendrapara	Nagaon	National average
BCCC-14	30.85	22.84	33.32	24.99	22.61	27.67	27.05
BRCJ-5	31.77	27.62	32.04	25.83	29.01	31.49	29.63
JRC 517+	30.09	26.22	32.25	29.38	27.64	33.79	29.89
JRC 698+	32.80	26.34	32.61	25.70	27.48	30.79	29.29
JRCP-6	32.78	26.43	29.84	25.28	32.15	30.90	29.56
JRCP-7	31.91	28.65	32.85	27.54	31.26	30.18	30.40
G. Mean	31.70	26.35	32.15	26.45	28.36	30.80	29.30
F test	*HS*	*NS*	*NS*	*HS*	*Sig.*	*NS*	*Sig.*
SEm±	0.42	1.72	0.78	0.57	1.94	1.67	0.54
LSD $_{p=0.5}$	1.25	-	-	1.72	5.87	-	1.53
CV (%)	2.62	13.05	4.85	4.32	13.74	10.85	9.09

+; check varieties,

Kalyani: The sowing date at this centre was 22.04.2020 and after 152 days of field duration it was harvested on 02.09.2020. No significant differences among entries were observed. Test entry BCCC-14 recorded high fibre yield (33.52 q/ha) which was on par best check JRC 698 (32.61 q/ha) followed by JRCP-7 (32.85 q/ha) and JRC-517 (32.25 q/ha).

Katihar: Sowing at this location was done on 28.04.2020 and the crop was harvested on 29.09.2020 with field duration of 154 days. Highly significant difference among entries was observed. Best check JRC 517 (29.38 q/ha) recorded high fibre yield followed by test entry JRCP-7 (27.54 q/ha) and BRCJ-5 (25.83 q/ha).

AVT-I with capsularis jute at Kalyani

Kendrapara: The sowing date of the trial at this centre was 16.04.2020 and after 141 days of field duration it was harvested on 04.09.2020. Significant difference among entries was observed. Test entry JRCP-6 recorded high fibre yield (32.15 q/ha) followed by JRCP-7 (31.26 q/ha), BRCJ-5 (29.01 q/ha) and best check JRC 517 (27.64 q/ha).

Nagaon: The trial was sown at this location on 24.04.2020 and harvested on 29.08.2020 after 127 days of field duration. No significant differences among entries were observed. Check variety JRC 517 (33.79 q/ha) recorded high fibre yield followed by BRCJ-5 (31.49 q/ha) which was on par with best check followed by JRCP-6 (30.90 q/ha).

National average: Highly significant difference among entries was observed based on pooled data analysis over locations. Test entry JRCP-7 was found to be the high fibre yielder (30.40 q/ha) followed by best check JRC 517 (29.89 q/ha) and BRCJ-5 (29.63 q/ha).

NP(JB) 5.53: AVT-II with white jute (*C. capsularis*)

The trial was constituted with four test entries and two check varieties namely JRC 517 and JRC 698. It was conducted over six locations such as Barrackpore, Coochbehar, Kalyani, Katihar, Kendrapara and Nagaon. Location wise results were discussed below and fibre yield data are presented in table 1.16.

Barrackpore: The trial was sown on 20.05.2020 and harvested on 21.09.2020 at the crop age of 124 days. Significant difference among entries was observed. Check variety JRC 517 (33.16 q/ha) recorded high fibre yield followed by BRCJ-1 (32.44 q/ha), JRCP-5 (30.19 q/ha) and check JRC 698 (27.98 q/ha). All test entries were on par with superior check JRC 517.

Highly significant differences among entries were revealed for pooled data analysis over years. Test entry BRCJ-1 (28.09 q/ha) was the highest yielder followed by NCJ-33-9 (27.96 q/ha), best check JRC 517 (27.72 q/ha) and these test entries were on par with best check.

Coochbehar: The trial was sown at this location on 13.05.2020 and harvested on 15.09.2020 after 125 days. Significant difference among entries was observed. Test entry BRCJ-1 (31.43 q/ha) recorded high fibre yield followed by best check JRC 698 (29.53 q/ha), NCJ-33-9 (29.48 q/ha) and BCCC-9 (28.64 q/ha).

Based on mean performance over years, revealed that highly significant difference among entries was observed. Test entry BRCJ-1 (34.08 q/ha) recorded highest fibre yield followed by best check JRC 698 (32.98 q/ha), JRCP-5 (32.22 q/ha) and NCJ-33-9 (32.11 q/ha). These test entries were on par with best check JRO 698.

Kalyani: The trial was sown on 22.04.2020 and harvested on 03.09.2020 at the crop age of 134 days. Highly significant difference among entries was observed. Test entry BCCC-9 (34.34 q/ha) recorded better fibre yield than best check JRC 517 (34.13 q/ha) followed by BRCJ-1 (32.76 q/ha) and these test entries were on par with superior check JRC 517.

Significant differences among entries were revealed for mean performance over years. Best check JRC 517 (29.41 q/ha) was high fibre yielder followed by JRCP-5 (27.69 q/ha) and BRCJ-1 (26.71 q/ha) and these test entries were on par with best check JRC 517.

Table 16 Pooled data of AVT-I (2019) and AVT-II (2020) with *C. capsularis* jute (fibre yield in q/ha)

Entrye	Barrackpore			Coochbehar			Kalyani			Katihar			Kendrapara			Nagaon			National average		
	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean
BCCC-9	22.50	27.10	24.80	33.57	28.64	31.11	18.99	34.34	26.67	26.35	23.86	25.11	30.98	20.50	25.74	24.26	29.48	26.87	26.11	27.32	26.71
BRCJ-1	23.73	32.44	28.09	36.73	31.43	34.08	20.66	32.76	26.71	31.90	29.68	30.79	19.47	28.61	24.04	27.87	26.66	27.27	26.73	30.27	28.50
JRC 517+	22.28	33.16	27.72	32.87	25.95	29.41	24.69	34.13	29.41	26.89	35.27	31.08	28.86	24.91	26.89	28.89	30.76	29.83	27.41	30.70	29.06
JRC 698+	26.19	27.98	27.09	36.43	29.53	32.98	20.30	27.94	24.12	26.59	29.16	27.88	28.56	28.54	28.55	24.07	27.51	25.79	27.02	28.44	27.73
JRCP-5	23.40	30.19	26.80	37.51	26.93	32.22	26.59	28.79	27.69	31.08	34.71	32.90	26.28	31.07	28.68	23.43	30.80	27.12	28.05	30.42	29.23
NCJ-33-9	30.06	25.85	27.96	34.73	29.48	32.11	20.54	30.86	25.70	27.78	21.08	24.43	22.17	25.49	23.83	21.48	28.80	25.14	26.13	26.93	26.53
G. Mean	24.69	29.45	27.07	35.31	28.66	31.99	21.96	31.47	26.72	28.43	28.96	28.70	26.05	26.52	26.29	25.00	29.00	27.00	26.91	29.01	27.96
F test	*Sig.*	*Sig.*	*HS*	*HS*	*Sig.*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*Sig.*	*HS*	*HS*	*NS*	*Sig.*	*HS*	*HS*	*HS*
SEm±	1.55	1.29	1.00	0.31	0.98	0.51	0.95	0.93	0.66	0.34	0.47	0.29	1.62	1.83	1.22	1.36	1.15	0.89	0.47	0.48	0.34
LSD $_{p=0.5}$	4.67	3.88	2.91	0.93	2.94	1.48	2.85	2.79	1.91	1.02	1.41	0.83	4.89	5.52	3.53	4.10	-	2.57	1.32	1.35	0.94
CV (%)	12.55	8.74	10.52	1.75	6.81	4.52	8.62	5.89	7.01	2.38	3.24	2.85	12.45	13.81	13.14	10.89	7.90	9.32	8.58	8.13	8.35

+; check varieties,

Katihar: At this centre sowing was done on 30.04.2020 and after 153 days the crop was harvested on 30.09.2020. Highly significant differences among entries were observed. Best check JRC 517 (35.27 q/ha) recorded high fibre yield followed by JRCP-5 (34.71 q/ha) and BRCJ-1 (29.68 q/ha).

Considering mean performance over years, highly significant differences among entries were observed. Test entry JRCP-5 (32.90 q/ha) was the top performer followed by best check JRC 517 (31.08 q/ha) which was statistically on par with best check JRC 517.

Kendrapara: The trial was sown at this location on 16.04.2020 and harvested on 04.09.2020 after 141 days. Significant differences among entries were observed. Test entry JRCP-5 was the highest performer with 31.07 q/ha of fibre yield followed by BRCJ-1 (28.61 q/ha), best check JRC 698 (28.54 q/ha) and NCJ-33-9 (25.49 q/ha).

Significant differences among entries were observed for mean performance over years. Test entry JRCP-5 was the highest fibre yielder with 28.68 q/ha followed by best check JRC 698 (28.55 q/ha), JRC 517 (26.89 q/ha), BCCC-9 (25.74 q/ha). These entries were statistically on par with best check JRC 698.

Nagaon: Sowing at this location was done on 27.04.2020 and after 126 days of field duration harvesting was done on 31.08.2020. No significant differences among entries were observed. Test entry JRCP-5 (30.80 q/ha) recorded high fibre yield over best check JRC 517 (30.76 q/ha) followed by BCCC-9 (29.48 q/ha) which was statistically on par with best check JRC 517.

Highly significant differences among entries were observed for mean analysis over years. Best check JRC 517 (29.83 q/ha) recorded high fibre yield followed by BRCJ-1 (27.27 q/ha), JRCP-5 (27.12 q/ha) and these test entries were statistically on par with best check JRC 517.

National average: In 2019 under AVT-I trial highly significant difference among entries was observed and based on pooled data JROBA-4 was significantly high fibre yielder with 33.28 q/ha than best check JRO 204 (31.94 q/ha) followed by JROBA-3 (32.38 q/ha) and JROP-2 (31.21 q/ha).

In 2020 under AVT-II trial highly significant differences among entries were revealed when compared at national level pooling over all locations. Best check JRC 517 recorded high fibre yield (30.70 q/ha) followed by JRCP-5 (30.42 q/ha) and BRCJ-1 (30.27 q/ha).

Analysis of mean over locations and years (grand mean) recorded highly significant difference among entries. Test entry JRCP-5 recorded highest fibre yield (29.23 q/ha) followed by check variety JRC 517 (29.06 q/ha) and these entries were on par with best check.

Kenaf

NP(CB) 1.49: IET with kenaf (*H. cannabinus*)

The trial comprising of seven test entries and two check varieties namely, HC 583 and AMC 108 was conducted over four locations i.e., Aduthurai, Amadalavalasa, Kendrapara and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.17.

Aduthurai: At this location sowing was done on 20.06.2020 and after 125 days of field duration harvesting was done on 15.10.2020. Test entry JRK-2019-3 (42.82 q/ha) recorded highest fibre yield followed by JRK-2019-1 (39.35 q/ha) and check variety AMC 108 (36.46 q/ha). No significant differences for fibre yield were observed among entries.

Table 1.17 IET with kenaf (*H. cannabinus*)-2020 (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Kendrapara	Rahuri	National average
AMC 108+	36.46	28.18	19.39	41.23	31.32
HC 583+	29.51	27.89	26.45	38.26	30.53
JRHC-15	29.51	22.51	20.49	43.58	29.02
JRK-2019-1	39.35	20.78	20.06	37.12	29.33
JRK-2019-2	31.25	21.82	17.43	39.91	27.60
JRK-2019-3	42.82	28.41	29.01	43.14	35.85
JRK-2019-4	26.62	19.62	16.10	35.26	24.40
G. Mean	33.65	24.17	21.27	39.79	29.72
F test	*NS*	*HS*	*HS*	*Sig.*	*HS*
SEm±	3.84	1.37	1.87	1.58	1.19
$LSD_{p=0.5}$	-	4.24	5.75	4.89	3.38
CV (%)	19.75	9.85	15.20	6.91	13.86

+; check varieties,

Amadalavalasa: Sowing of the trial was done on 15.06.2020 at this location and harvested after 135 days after sowing on 28.10.2020. At this location test entry JRK-2019-3 (28.41 q/ha) out yielded check variety AMC 108 (28.18 q/ha) followed by HC 583 (27.89 q/ha) which were statistically at par for fibre yield. Highly significant difference for fibre yield was observed among entries.

Kendrapara: The field trial at this location was sown on 20.06.2020 and harvested on 05.11.2020 after 138 days. Test entry JRK-2019-3 (29.01 q/ha) recorded highest fibre yield followed by check variety HC 583 (26.45 q/ha) which were statistically on par for fibre yield. Highly significant difference was observed among entries.

IET with kenaf at Kendrapara

Rahuri: Sowing of the trial was done on 27.06.2020 and the crop was harvested after 105 days on 10.10.2020. Test entry JRHC-15 (43.58 q/ha) recorded highest fibre yield followed by JRK-2019-3 (43.14 q/ha) and check variety AMC 108 (41.23 q/ha) which were statistically on par for fibre yield. Significant difference among entries was observed.

IET with kenaf at Rahuri

National average: Analysis of data at national level revealed that difference among test entries was highly significant. Test entry JRK-2019-3 (35.85 q/ha) significantly out yielded the best check variety AMC 108 (31.32 q/ha) for fibre yield.

NP(CB) 1.50: AVT-I with kenaf (*H. cannabinus*)

The trial was constituted with eight test entries and two check varieties namely, HC 583 and AMC 108 and conducted over five locations i.e., Aduthurai, Amadalavalasa, Barrackpore, Kendrapara and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.18.

Aduthurai: Sowing was done on 19.06.2020 and after 118 days of field duration harvesting was done on 15.10.2020. None of the test entry performed better than the best check HC 583 (26.83 q/ha) followed by JRK-2017-2 (24.69 q/ha), AMC 108 (24.34 q/ha) and JRK-2018-4 (24.22 q/ha). Highly significant differences for fibre yield were observed among entries.

Table 1.18 AVT-I with kenaf (*H. cannabinus*)-2020 (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Barrackpore	Kendrapara	Rahuri	National average
AMC 108+	24.34	18.35	28.17	22.79	30.70	24.87
HC 583+	26.83	20.26	25.40	24.33	33.81	26.13
JRK-2017-1	23.03	27.14	27.94	32.05	34.17	28.87
JRK-2017-2	24.69	28.11	29.01	26.76	36.57	29.03
JRK-2017-5	21.13	23.58	25.90	27.07	32.33	26.00
JRK-2018-1	22.32	14.86	26.49	26.09	32.71	24.49
JRK-2018-3	21.37	20.13	27.52	27.42	31.35	25.56
JRK-2018-4	24.22	20.24	31.69	24.79	33.57	26.90
G. Mean	23.49	21.58	27.76	26.41	33.15	26.48
F test	*HS*	*HS*	*Sig.*	*HS*	*HS*	*HS*
SEm±	0.57	1.05	1.10	1.41	0.79	0.46
$LSD_{p=0.5}$	1.68	3.10	3.22	4.14	2.31	1.28
CV (%)	4.87	9.77	7.88	10.66	4.74	7.73

+; check varieties

Amadalavalasa: Sowing of trial was done on 15.06.2020 at this location and harvested after 135 days on 28.10.2020. Test entries JRK-2017-2 (28.11 q/ha), JRK-2017-1 (27.14 q/ha) and JRK-2017-5 (23.58 q/ha) performed significantly better than the best check HC 583 (20.26 q/ha) for fibre yield. Highly significant difference was observed among entries.

AVT-I with kenaf at Amadalavalasa

Barrackpore: The trial was sown on 03.07.2020 at this centre and harvested on 03.11.2020 when the crop was 123 days old. Test entry JRK-2018-4 (31.69 q/ha) and JRK-2017-2 (29.01 q/ha) recorded highest fibre yield followed by check variety AMC 108 (28.17 q/ha) and test entries JRK-2017-1 (27.94 q/ha) and JRK-2018-3 (27.52 q/ha). Significant difference was observed among entries.

Kendrapara: The field trial at this location was sown on 04.07.2020 and harvested on 10.11.2020 after 129 days. At this location test entry JRK-2017-1 (32.05 q/ha) significantly out yielded the best check variety HC 583 (24.33 q/ha) for fibre yield. Other better performing entries were JRK-2018-3 (27.42 q/ha) and JRK-2017-5 (27.07 q/ha). Highly significant difference was observed among entries.

AVT-I with kenaf at Rahuri

Rahuri: Sowing of the trial was done on 27.06.2020 and the crop was harvested after 105 days on 10.10.2020. Highly significant difference was observed among the entries. Test entry JRK-2017-2 (36.57 q/ha) recorded significantly high fibre yield over the best check HC 583 (33.81q/ha) followed by JRK-2017-1 (34.17 q/ha) and JRK-2018-4 (33.57 q/ha) which were statistically at par with best check.

National average: Based on pooled data analysis over locations, test entries JRK-2017-2 (29.09 q/ha) and JRK-2017-1 (28.87 q/ha) significantly out yielded the best check variety HC 583 (26.13 q/ha) for fibre yield. Other better performing entry was JRK-2018-4 (26.90 q/ha). Highly significant difference among entries was observed.

NP(CB) 1.51: AVT-II with kenaf (*H. cannabinus*)

The trial was constituted with four test entries and two check varieties namely, HC 583 and AMC 108 and conducted over six locations i.e., Aduthurai, Amadalavalasa, Barrackpore, Coochbehar, Kendrapara and Rahuri. Data was not received from Coochbehar centre. Location wise results are discussed below and fibre yield data are presented in table 1.19.

Aduthurai: The trial was sown on 19.06.2020 and harvested on 15.10.2020 at the crop age of 118 days. Test entry JRK-2016-2 (24.04 q/ha) recorded significantly high fibre yield over the best check variety AMC 108 (21.49 q/ha) followed by JRK-2016-5 (21.66 q/ha). Highly significant difference among entries was observed.

Based on mean performance over years, check variety AMC 108 (21.70 q/ha) recorded highest fibre yield followed by test entry JRK-2016-2 (21.67 q/ha) and JRK-2016-5 (20.97 q/ha). Entries were highly significant.

Amadalavalasa: Sowing at this location was done on 16.06.2020 and after 134 days of field duration harvesting was done on 28.10.2020. Test entries JRK-2016-5 (21.93 q/ha), JRK-2016-2 (21.25 q/ha) and JRK-2016-1 (18.78 q/ha) out yielded best check AMC 108 (18.72 q/ha) followed by HC 583 (17.55 q/ha) for fibre yield. Entries were not significantly different.

On the basis of analysis of data over years, again test entries JRK-2016-5 (25.81 q/ha) and JRK-2016-2 (25.47 q/ha) out yielded best check AMC 108 (23.33 q/ha) for fibre yield potential. Highly significant difference among entries was observed.

AVT-II with kenaf at Amadalavalasa

Barrackpore: The trial was sown at this location on 03.07.2020 and harvested on 03.11.2020 at the crop age of 123 days. Test entries JRK-2016-5 (32.37 q/ha) and JRK-2016-2 (29.98 q/ha) out yielded the best check AMC 108 (29.55 q/ha) for fibre yield at this location. Significant differences among entries were observed.

Considering mean performance over years again test entries JRK-2016-5 (33.21 q/ha) and JRK-2016-2 (32.27 q/ha) out yielded the best check AMC 108 (31.50 q/ha) for fibre yield. Highly significant differences among entries were observed.

Kendrapara: The trial was sown at this location on 20.06.2020 and harvested on 05.11.2020 after 138 days. Test entry JRK-2016-5 (30.80 q/ha) out yielded best check AMC 108 (29.17 q/ha) fibre yield followed by JRK-2016-1 (25.70 q/ha). Significant differences among entries were observed.

As per analysis of mean performance over years check variety AMC 108 (29.23 q/ha) was best performer followed by test entry JRK-2016-5 (27.90 q/ha). Entries were highly significant.

Rahuri: The trial was sown at this location on 27.06.2020 and harvested on 10.10.2020 after 105 days. Test entry JRK-2016-5 (38.21 q/ha) out yielded the best check variety AMC 108 (36.93 q/ha) for fibre yield closely followed by test entries JRK-2016-1 (36.37 q/ha) and JRK-2016-2 (35.70 q/ha). Highly significant differences among entries were observed.

AVT-II with kenaf at Rahuri

Table 1.19 Pooled data of AVT-I (2018) and AVT-II (2020) with kenaf (*H. cannabinus*) (fibre yield in q/ha)

Entry	Aduthurai			Amadalavalasa			Barrackpore*			Coochbehar#	Kendrapara			Rahuri			National average		
	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean^
AMC 108+	21.90	21.49	21.70	27.94	18.72	23.33	33.44	29.55	31.50	30.98	29.29	29.17	29.23	24.21	36.93	30.57	27.96	27.17	27.60
HC 583+	17.54	13.95	15.75	23.80	17.55	20.68	30.66	26.37	28.52	28.24	24.51	24.91	24.71	19.13	20.67	19.90	23.98	20.69	22.48
JRK-2016-1	16.84	19.41	18.13	22.37	18.78	20.58	31.29	28.69	29.99	29.51	18.97	25.70	22.34	16.80	36.37	26.59	22.63	25.79	24.07
JRK-2016-2	19.30	24.04	21.67	29.69	21.25	25.47	34.56	29.98	32.27	28.18	24.88	22.47	23.68	25.72	35.70	30.71	27.06	26.69	26.89
JRK-2016-3	18.36	-	18.36	25.64	-	25.64	27.93	-	27.93	26.16	25.89	-	25.89	23.89	-	23.89	24.65	-	-
JRK-2016-5	20.28	21.66	20.97	29.68	21.93	25.81	33.21	32.37	32.79	33.87	25.00	30.80	27.90	17.43	38.21	27.82	26.58	28.99	27.68
G. Mean	19.04	20.11	19.58	26.52	19.64	23.08	31.85	29.39	30.62	29.49	24.76	26.61	25.69	21.19	33.57	27.38	25.47	25.86	25.65
F test	*HS*	*HS*	*HS*	*HS*	*NS*	*HS*	*Sig.*	*Sig.*	*HS*	*HS*	*Sig.*	*Sig.*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*
SEm±	0.64	1.07	0.64	1.44	1.29	0.96	1.40	1.20	0.97	0.56	1.70	1.63	1.13	0.71	1.05	0.63	0.48	0.56	0.55
LSD $_{p=0.5}$	1.94	3.04	1.83	4.35	3.64	2.70	4.22	3.40	2.67	1.68	5.12	4.60	3.27	2.15	2.96	1.88	1.34	1.60	1.09
CV (%)	6.76	10.68	9.04	10.87	13.09	11.31	8.78	8.16	8.35	3.79	13.73	12.20	12.40	6.75	6.22	6.73	9.16	9.76	9.70

+; check varieties,* In 2018, trial was conducted in Bamra; # Coochbehar trial was failed in 2020; ^ Pooled analysis without Coochbehar

Based on mean performance over years, test entry JRK-2016-2 (30.71 q/ha) out yielded the best check AMC 108 (30.57 q/ha) for fibre yield.

National Average: In 2018 under AVT-I trial highly significant differences among entries were observed. Check variety AMC 108 (27.96 q/ha) recorded highest fibre yield followed by test entries JRK-2016-2 (27.06 q/ha) and JRK-2016-5 (26.58 q/ha).

In 2020 under AVT-II trial also significant differences among entries were revealed when pooled data was analysed across locations. Test entry JRK-2016-5 (28.99 q/ha) recorded highest fibre yield followed by the best check variety AMC 108 (27.17 q/ha).

Based on pooled analysis of data over locations and years (grand mean), highly significant difference among entries were recorded. Check variety AMC 108 (27.26 q/ha) recorded highest fibre yield followed by test entries JRK-2016-5 (27.06 q/ha) and JRK-2016-2 (26.76 q/ha).

Roselle

NP(SB) 12.78: IET with roselle (*H. sabdariffa*)

The trial was constituted with five test entries and two check varieties namely, AMV 5 and HS 4288 and conducted over four locations i.e., Aduthurai, Amadalavalasa, Katihar, and Rahuri. Location wise results are discussed below and fibre yield data are presented in table 1.20.

Aduthurai: At this location sowing was done on 20.06.2020 and after 145 days of field duration harvesting was done on 12.11.2020. Test entry AD(RO)-17002 (41.09 q/ha) recorded highest fibre yield followed by check variety AMV 5 (39.93 q/ha) at this location. Entries were significantly different.

Amadalavalasa: Sowing of the trial was done on 15.06.2020 at this location and harvesting was done after 157 days on 19.11.2020. Check variety HS 4288 (36.86 q/ha) recorded highest fibre yield followed by test entry AHS-333 (33.04 q/ha) and AD(RO)-17002 (31.83 q/ha). Significant difference was observed among entries.

Katihar: The field trial at this location was sown on 13.06.2020 and harvested on 03.11.2020 after 143 days. Highly significant difference was observed among entries. Test entries AHS-333 (23.61 q/ha), AHS-343 (23.44 q/ha) and AD(RO)-17002 (23.15 q/ha) out yielded best check variety HS 4288 (23.03 q/ha) for fibre yield.

Table 1.20 IET with roselle (*H. sabdariffa*)-2020 (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Katihar	Rahuri	National average
AD(RO)-17002	41.09	31.83	23.15	23.32	29.85
AHS-321	38.77	16.20	17.65	17.33	22.49
AHS-333	35.30	33.04	23.61	22.85	28.70
AHS-343	26.04	30.03	23.44	14.35	23.47
AMV 5+	39.93	25.69	21.12	15.04	25.45
HS 4288+	33.56	36.86	23.03	13.08	26.63
JRR-2018	24.88	16.32	15.63	12.27	17.28
G. Mean	34.23	27.14	21.09	16.89	24.84
F test	*HS*	*HS*	*HS*	*HS*	*HS*
SEm±	2.68	1.61	0.52	1.49	0.88
LSD $_{p=0.5}$	8.26	4.98	1.60	4.60	2.49
CV (%)	13.57	10.31	4.26	15.31	12.23

+; check varieties

Rahuri: Sowing of the trial was done on 11.07.2020 and the crop was harvested after 120 days of crop duration on 08.11.2020. Test entry AD(RO)-17002 (23.32 q/ha) recorded highest fibre yield followed by AHS-333 (22.85 q/ha) and AHS-321 (17.33 q/ha) at this location. Highly significant difference was observed among the entries.

National average: Based on pooled analysis of data across locations, differences among test entries were highly significant. Test entry AD(RO)-17002 (29.85 q/ha) turned out to be the best performing entry for fibre yield followed by AHS-333 (28.70 q/ha) and check variety HS 4288 (26.63 q/ha).

NP(SB) 12.79: AVT-I with roselle (*H. sabdariffa*)

The trial was constituted with three test entries and two check varieties namely, AMV 5 and HS 4288 and conducted over six locations i.e., Aduthurai, Amadalavalasa, Coochbehar, Katihar, Kendrapara and Rahuri. Coochbehar and Kendrapara centre did not report data as trial was failed due to heavy rain after sowing. Location wise results are discussed below and fibre yield data are presented in table 1.21.

Aduthurai: Sowing at this location was done on 20.06.2020 and after 145 days of field duration harvesting was done on 12.11.2020. Check variety AMV 5 (24.93 q/ha) recorded highest fibre yield at this location which was followed by test entries AHS-335 (24.34 q/ha) and AHS-342 (23.74 q/ha). Highly significant differences for fibre yield were observed among entries.

Amadalavalasa: Experiment was sown at this location on 16.06.2020 and harvesting was done after 156 days on 19.11.2020. Check variety HS 4288 (24.69 q/ha) recorded highest fibre yield followed by test entry AHS-335 (23.68 q/ha) at this centre. Highly significant difference was observed among entries.

Katihar: The field trial was sown on 12.06.2020 and harvested on 30.10.2020 after 140 days at this location. Test entries BRRM-1 (35.20 q/ha) and AHS-342 (31.26 q/ha) out yielded best check AMV 5 (31.22 q/ha) for fibre yield at this location. Difference among entries was highly significant.

Rahuri: Sowing of trial was done on 11.07.2020 and the crop was harvested after 120 days on 08.11.2020. Test entry AHS-335 (19.64 q/ha) recorded highest fibre yield followed by check variety HS 4288 (17.30 q/ha). The overall fibre yield was exceptionally low at this location. Highly significant difference was observed among the entries.

Table 1.21 AVT-I with roselle (*H. sabdariffa*)-2020 (fibre yield in q/ha)

Entry	Aduthurai	Amadalavalasa	Katihar	Rahuri	National average
AHS-335	24.34	23.68	29.50	19.64	24.29
AHS-342	23.74	18.92	31.26	12.86	21.70
AMV 5+	24.93	15.61	31.22	13.34	21.28
BRRM-1	20.77	21.55	35.20	13.48	22.75
HS 4288+	21.55	24.69	30.69	17.30	23.56
G. Mean	23.07	20.89	31.57	15.32	22.71
F test	*HS*	*HS*	*HS*	*HS*	*HS*
SEm±	0.98	1.81	0.38	0.81	0.56
LSD $_{p=0.5}$	2.13	3.95	0.82	1.77	1.13
CV (%)	5.99	12.28	1.69	7.48	6.99

+; Check varieties,

National average: Pooled analysis over locations revealed highly significant differences among entries. Test entry AHS-335 was the best performer with 24.29 q/ha fibre yield which was closely followed by check variety HS 4288 (23.56 q/ha).

NP(SB) 12.80: AVT-II with roselle (*H. sabdariffa*)

The trial was constituted with four test entries and two check varieties namely, AMV 5 and HS 4288 and conducted over six locations i.e., Aduthurai, Amadalavalasa, Coochbehar, Katihar, Kendrapara and Rahuri. Coochbehar centre did not report data as trial was failed due to heavy rain after sowing. Location wise results are discussed below and fibre yield data are presented in table 1.22.

Aduthurai: The trial was sown on 20.06.2020 and after 145 days of field duration harvesting was done on 12.11.2020. Test entry AHS-307 (26.35 q/ha) recorded highest fibre yield followed by check variety AMV 5 (25.28 q/ha) and AHS-309 (23.92 q/ha). Significant difference among entries was observed.

Considering mean performance over years, again test entry AHS-307 (22.42 q/ha) recorded highest fibre yield followed by check variety AMV 5 (22.26 q/ha).

Amadalavalasa: Sowing at this location was done on 16.06.2020 and after 156 days of field duration harvesting was done on 19.11.2020. At this location also test entry AHS-307 (31.70 q/ha) recorded highest fibre yield followed by check variety HS 4288 (27.98 q/ha). Highly significant differences among entries were observed.

Based on pooled analysis over years too test entry AHS-307 (27.94 q/ha) out yielded best check HS 4288 (26.17 q/ha) for fibre yield potential.

AVT-II with roselle at Amadalavalasa

Katihar: At this centre sowing was done on 13.06.2020 and after 144 days the crop was harvested on 04.11.2020. Check variety AMV 5 (34.92 q/ha) recorded significantly high fibre yield followed by test entries AHS-310 (28.55 q/ha) and AHS-309 (27.66 q/ha). Highly significant differences among entries were observed.

Considering mean performance over years also again check variety AMV 5 (26.48 q/ha) recorded highest fibre yield followed by test entries AHS-309 (24.01 q/ha) and AHS-310 (23.24 q/ha). Entries were highly significant.

Kendrapara: The trial was sown at this location on 20.06.2020 and harvested on 07.11.2020 after 140 days. Significant difference among entries was observed. Test entry AHS-307 (29.91 q/ha) out yielded the best check AMV 5 (26.59 q/ha) for fibre yield followed by test entries AHS-309 (25.76 q/ha) and AHS-310 (24.57 q/ha).

Table 1.22 Pooled data of AVT-I (2018) and AVT-II (2020) with roselle (*H. sabdariffa)* (fibre yield in q/ha)

Entry	Aduthurai			Amadalavalasa			Cooch behar	Katihar			Kendrapara			Rahuri			National average		
	2018	2020	Mean	2018	2020	Mean	2018	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean^
AHS-307	18.49	26.35	22.42	24.17	31.70	27.94	33.50	19.73	22.97	21.35	25.96	29.91	27.94	19.34	17.29	18.32	23.53	25.64	23.59
AHS-309	19.66	23.92	21.79	25.44	17.63	21.54	26.57	20.36	27.66	24.01	21.89	25.76	23.83	23.90	19.68	21.79	22.97	22.93	22.59
AHS-310	19.34	23.27	21.31	24.79	20.09	22.44	31.47	17.92	28.55	23.24	23.07	24.57	23.82	21.05	19.15	20.10	22.94	23.13	22.18
AMV 5+	19.24	25.28	22.26	19.74	14.46	17.10	31.50	18.04	34.92	26.48	22.34	26.59	24.47	21.15	15.21	18.18	22.00	23.29	21.70
HS 4288+	20.54	22.79	21.67	24.36	27.98	26.17	28.13	19.76	22.32	21.04	21.78	22.58	22.18	23.16	18.00	20.58	22.96	22.73	22.33
JRR-16	18.60	-	-	29.30	-	-	26.04	17.98	-	-	17.51	-	-	20.61	-	-	21.67	-	-
G. Mean	19.31	24.32	21.82	24.63	22.37	23.50	29.54	18.97	27.28	23.13	22.09	25.88	23.99	21.54	17.86	19.70	22.68	23.55	22.48
F test	*NS*	*Sig.*	*HS*	*HS*	*HS*	*HS*	*HS*	*Sig.*	*HS*	*HS*	*Sig.*	*Sig.*	*Sig.*	*HS*	*Sig.*	*HS*	*HS*	*HS*	*HS*
SEm±	0.69	0.66	0.52	1.31	1.72	1.15	0.94	0.52	0.25	0.31	1.51	1.50	1.00	0.76	0.83	0.59	0.41	0.51	0.34
$LSD_{p=0.5}$	-	2.03	1.45	3.94	5.30	3.27	2.83	1.58	0.79	0.88	4.54	4.61	2.96	2.30	2.54	1.67	1.16	1.43	0.96
CV (%)	7.07	5.41	6.42	10.62	15.37	13.77	6.38	5.48	1.88	3.67	13.63	11.56	11.73	7.07	9.24	8.19	8.95	9.59	9.67

+; check varieties, #; Coochbehar trial was failed in 2020; ^ Pooled analysis without Coochbehar and test entry JRR-16

On the basis of pooled analysis over years also test entry AHS-307 (27.94 q/ha) recorded significantly high fibre yield than the best check variety AMV 5 (24.47 q/ha) which was closely followed by AHS-309 (23.83 q/ha). Entries were significantly different.

Rahuri: The trial was sown at this location on 11.07.2020 and harvested on 08.11.2020 after 120 days of sowing. Test entry AHS-309 (19.68 q/ha) recorded highest fibre yield closely followed by AHS-310 (19.15 q/ha and check variety HS 4288 (18.00 q/ha) for fibre yield. Significant difference among entries was observed.

Considering mean performance over years, test entry AHS-309 (21.79 q/ha) out yielded the best check variety HS 4288 (20.58 q/ha) for fibre yield. Highly significant differences among entries were observed.

AVT-II with roselle at Rahuri

National Average: In 2018 under AVT-I trial highly significant differences among entries were observed. However, test entry AHS-307 (23.53 q/ha) out yielded the best check HS 4288 (22.96 q/ha) for fibre yield at this location which was closely followed by test entries AHS-309 (22.97 q/ha) and AHS-310 (22.94 q/ha).

In 2020 under AVT-II trial highly significant difference among entries was observed when compared at national level pooling over locations. Test entries AHS-307 (25.64 q/ha) significantly out yielded the best check ANV 5 (23.29 q/ha) for fibre yield which was closely followed by test entry AHS-310 (23.13 q/ha).

Analysis of mean over locations and years (grand mean) revealed highly significant differences among entries. Test entries AHS-307 (23.59 q/ha) significantly out yielded the best check variety HS 4288 (22.33 q/ha) for fibre yield followed by AHS-309 (22.59 q/ha).

Sunnhemp

NP(SNH-B) 1.31: IET with sunnhemp (*C. juncea*)

The trial was conducted with four test entries and two check varieties namely, SUIN 053 and SH 4 over four locations namely, Aduthurai, Budbud, Kalyani and Pratapgarh. Location wise results are discussed below and fibre yield data are presented in table 1.23.

Aduthurai: The trial was sown at this location on 26.06.2020 and harvested on 27.09.2020 at the crop age of 93 days. Check variety SH 4 (9.25 q/ha) recorded highest fibre yield followed by test entries SUNC-14 (8.32 q/ha), ADSH-17009 (8.31 q/ha) and SUNC-13 (8.16 q/ha). Entries were not significantly different.

Budbud: Sowing at this centre was done on 16.06.2020 and harvested on 16.09.2020 when the crop age was 92 days. The average performance of entries at this location was very low with high value of Coefficient of variation indicated poor crop growth and lack of precision while conducting the trial. Test entries SUNC-13 (7.13 q/ha) and SUNC-14 (6.43 q/ha) performed better than the best check SH 4 (4.60 q/ha) for fibre yield. Significant differences among entries were observed.

Kalyani: The trial was sown at this location on 26.06.2020 and harvested on 27.09.2020 when the crop age was 93 days. Test

IET with sunnhemp at Kalyani

entry SUNC-13 (15.80 q/ha) performed better than the best check SUIN 053 (14.00 q/ha) for fibre yield at this location. Differences among entries were significant.

Pratapgargh: The crop was sown at this location on 12.06.2020 and harvested on 11.09.2020 after 85 days of sowing. The average performance of entries at this location also was very low with high value of Coefficient of variation indicated poor crop growth and lack of precision while conducting the trial. None of the test entries at this location performed better than best check variety SUIN 053 (8.51 q/ha) for fibre yield. Differences among entries were highly significant.

National average: Analysis of data over locations revealed highly significant differences among entries. Test entry SUNC-13 (9.06 q/ha) out yielded the best check SUIN 053 (8.66 q/ha) for fibre yield closely followed by SUNC-12 (8.68 q/ha).

Table 1.23 IET with sunnhemp (*C. juncea*)-2020 (fibre yield in q/ha)

Entry	Aduthurai	Budbud	Kalyani	Pratapgarh	National average
ADSH-17009	8.31	2.83	11.57	1.41	6.03
SH 4+	9.25	4.60	10.24	3.89	7.00
SUIN 053+	7.71	4.41	14.00	8.51	8.66
SUNC-12	7.95	5.43	13.43	7.92	8.68
SUNC-13	8.16	7.13	15.80	5.15	9.06
SUNC-14	8.32	6.43	13.25	3.01	7.75
G. Mean	8.28	5.14	13.05	4.98	7.86
F test	*NS*	*HS*	*Sig.*	*HS*	*HS*
SEm±	0.44	0.52	0.95	0.47	0.44
$LSD_{p=0.5}$	1.39	1.62	2.99	1.50	0.90
CV (%)	9.24	17.33	12.58	16.52	13.85

+; check variety,

Flax

NP(FB) 1.20: AVT-II with flax (*L. usitatissimum*)

The trial was conducted with four test entries and one check variety JRF 2 at five locations namely, Coochbehar, Kalimpong, Nagaon, Pratapgrarh and Sorbhog. Nagaon and Sorbhog centres did not report fibre yield data owing to the lack of scutching machine. Location-wise results of plant height, green biomass and fibre yield are discussed below and presented in table 1.24, 1.25 and 1.26, respectively.

Coochbehar: The trial was sown at this location on 25.10.2019 and harvested on 19.02.2020 after 107 days. Test entry JRF-16 attained better plant height (108.3 cm), green biomass (183.91 q/ha) and fibre yield (13.25 q/ha) than check variety JRF 2 (102.5 cm, 179.67 q/ha and 12.19 q/ha). The best entry JRF-16 was statistically at par with check variety for all the traits under study.

Considering pooled analysis over years, again test entry JRF-16 out yielded check variety JRF 2 (97.2 cm, 168.38 q/ha and 13.61 q/ha) for plant height (102.4 cm), green biomass yield (171.62 q/ha) and fibre yield (15.12 q/ha). Entries were not significantly different

Kalimpong: Experiment at this location was sown on 11.11.2019 and harvested on 04.03.2020 at the crop age of 114 days. Test entry JRF-16 performed better than check variety JRF 2 (100 cm, 179.68 q/ha and 12.79 q/ha) for plant height (104.8 cm), green biomass (187.1 q/ha) and fibre yield (13.81 q/ha). Entries were not significantly different for any trait.

At this location AVT-I trial was conducted during 2017-18 hence, pooled analysis not carried out.

Nagaon: Experiment at this location was sown on 15.11.2019 and harvested on 17.04.2020 at the crop age of 123 days. None of the test entries performed better than check variety JRF 2 for plant height (112.3 cm) and green biomass (135.42 q/ha) at this location. Data on fibre yield was not reported.

Based on pooled analysis over years also none of the test entries performed better than check variety JRF 2 (111.4 cm) for plant height but test entry JRF-18 (141.27 q/ha) out yielded check variety JRF 2 (133.82 q/ha) for green biomass yield.

Pratapgarh: The experiment was laid on 22.10.2019 and harvested on 04.03.2020 after 124 days of sowing. None of the test entry performed better than check variety JRF 2 for plant height (124.5 cm) but test entry JRF-15 performed better for green biomass yield (236.34 q/ha) and dry fibre yield (13.98 q/ha) but difference was not significant. Entries were not significantly different for plant height and green biomass yield.

Considering mean performance over years, none of the test entry performed better than the check variety JRF 2 for plant height (122.4 cm). Test entry JRF-15 (223.03 q/ha) for green biomass and test entry JRF-17 (14.64 q/ha) for dry fibre yield out yielded check variety JRF 2 (205.79 q/ha and13.29 q/ha).

Sorbhog: The trial was sown on 11.12.2019 at this centre and after 149 days of crop age harvested on 08.05.2020. At this centre none of the test entries performed better than check variety JRF 2 for plant height (106.3 cm) and green biomass yield (45.14 q/ha). Entries were significantly different for plant height and green biomass yield.

Considering mean performance over locations, test entry JRF-18 (96.9 cm) performed numerically better than check variety JRF 2 (92.5) for plant height. Test entry JRF-18 (112.71 q/ha) was the best performer for green biomass yield followed by JRF-17 (101.37 q/ha) and check variety JRF 2 (86.68 q/ha). Entries were significantly different.

National Average: In 2018 under AVT-I none of test entry attained better plant height than check variety JRF 2 (100.3 cm) whereas all the test entry performed better than check variety for green biomass yield. Test entry JRF-16 (15.17 q/ha) was the best performer for fibre yield followed by JRF-17 (14.87 q/ha) and check variety JRF-2 (14.11 q/ha). Entries were significantly different for all the traits.

In 2020 under AVT-II trial significant difference among entries was observed when compared at national level pooling over locations. None of the test entries performed better than check variety JRF 2 for plant height (108.9 cm) and green biomass yield (181.33 q/ha). For dry fibre yield test entry JRF-16 (13.59 q/ha) was the best performer followed by JRF-17 (13.18 q/ha) and check variety JRF 2 (12.79 q/ha).

Analysis of mean over locations and years (grand mean) revealed significant differences among entries. None of the test entries performed better than check variety JRF 2 for plant height (104.6 cm) and green biomass yield (169.33 q/ha). For dry fibre yield test entries JRF-16 (14.35 q/ha) and JRF-17 (14.03 q/ha) performed numerically better than check variety JRF 2 (13.45 q/ha) but were statistically at par for fibre yield potential.

EVALUATION TRIALS FOR SPECIAL TRAITS

NP (JB) 4.10: AVT-II with tossa jute (*C. olitorius*) for leafy vegetable

The trial was constituted with four test entries and two check varieties namely JRO 204 and JRO 524 and conducted over five locations i.e., Barrackpore, Coochbehar, Kalyani, Katihar and Nagaon. Location wise results are discussed below and fresh leaf yield data are presented in table 1.27.

Table 1.24 Pooled data of AVT-I (2017-18) and AVT-II (2019-20) with flax (*L. usitatissimum*) (Plant height in cm)

Entry	Coochbehar			Kalimpong	Nagaon			Pratapgarh			Sarbhog			National average		
	2018	2020	Mean	2020	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean
JRF 2+	91.9	102.5	97.2	100.0	110.5	112.3	111.4	120.3	124.5	122.4	78.8	106.3	92.5	100.3	108.9	104.6
JRF-15	88.4	99.0	93.7	95.4	94.3	88.9	91.6	113.1	119.8	116.4	69.3	75.0	72.1	91.3	96.1	93.7
JRF-16	96.5	108.3	102.4	104.8	99.3	95.2	97.2	110.9	118.7	114.8	76.3	73.8	75.0	95.7	100.6	98.1
JRF-17	93.0	102.4	97.7	100.2	96.5	99.0	97.8	110.3	118.2	114.3	90.0	80.0	85.0	97.5	99.7	98.6
JRF-18	83.6	101.8	92.7	98.4	100.0	104.3	102.1	112.7	122.2	117.4	95.0	98.8	96.9	97.8	104.7	101.2
G. Mean	90.7	102.8	96.7	99.8	100.1	99.9	100.0	113.4	120.7	117.1	81.9	86.8	84.3	96.5	102.0	99.3
F test	*NS*	*NS*	*NS*	*NS*	*Sig.*	*HS*	*HS*	*Sig.*	*NS*	*Sig.*	*NS*	*HS*	*Sig.*	*Sig.*	*Sig.*	*Sig.*
SEm±	3.22	2.74	2.10	3.41	2.74	3.03	2.01	1.94	3.29	1.85	6.60	4.42	3.98	2.02	1.41	1.26
$LSD_{p=0.5}$	9.94	7.82	5.99	9.72	8.43	8.64	5.72	5.99	9.37	5.26	20.33	12.60	11.33	5.89	4.01	3.60
CV (%)	7.11	4.94	6.00	6.33	5.46	5.62	5.40	3.42	5.04	4.36	16.13	9.43	13.02	8.37	6.22	7.30

+; check variety, *; Kalimpong data not included in pooled analysis due to 1 year data.

Table 1.25 Pooled data of AVT-I (2017-18) and AVT-II (2019-20) with flax (*L. usitatissimum*) (Green biomass in q/ha)

Entry	Coochbehar			Kalimpong	Nagaon			Pratapgarh			Sarbhog			National average		
	2018	2020	Mean	2020	2018	2020	Mean	2018	2020	Mean	2018	2020	Mean	2018	2020#	Mean*
JRF 2+	157.08	179.67	168.38	179.68	132.21	135.42	133.82	181.02	230.56	205.79	128.21	45.14	86.68	149.63	181.33	169.33
JRF-15	149.39	164.30	156.85	153.62	157.59	57.29	107.44	209.72	236.34	223.03	82.80	33.12	57.96	149.88	152.89	162.44
JRF-16	159.32	183.91	171.62	187.10	156.25	89.58	122.92	200.46	209.03	204.75	112.18	33.39	72.79	157.05	167.41	166.43
JRF-17	161.94	173.05	167.50	176.99	137.55	70.83	104.19	207.64	195.37	201.51	168.27	34.46	101.37	168.85	154.06	157.73
JRF-18	156.22	152.60	154.41	171.22	176.28	106.25	141.27	194.91	222.22	208.57	184.29	41.13	112.71	177.93	163.07	168.08
G. Mean	156.79	170.71	163.75	173.72	151.98	91.88	121.93	198.75	218.70	208.73	135.15	37.45	86.30	160.67	163.75	164.80
F test	*NS*	*Sig.*	*Sig.*	*NS*	*NS*	*HS*	*Sig.*	*NS*	*NS*	*Sig.*	*Sig.*	*Sig.*	*Sig.*	*NS*	*Sig.*	*Sig.*
SEm±	8.99	6.83	5.63	8.69	13.51	6.11	7.49	8.61	10.07	6.49	18.19	2.63	9.40	6.46	3.00	3.55
$LSD_{p=0.5}$	27.71	19.46	16.04	24.77	41.62	17.42	21.36	26.54	28.70	18.51	56.04	7.51	26.78	18.86	8.56	10.13
CV (%)	8.99	7.40	9.49	9.26	13.51	12.31	16.98	8.61	8.52	8.59	18.19	13.01	30.07	6.46	9.78	14.06

+; check variety, # In pooled analysis of 2020, data of Sorbhog centre not considered due to very low green biomass yield, *;In pooled analysis over locations and years, Kalimpong and Sarbhog data not considered due to single year data and very low yield, respectively.

Table 1.26 AVT-I (2017-18) and AVT-II (2019-20) with flax (*L. usitatissimum*) (fibre yield in q/ha)

Entry	Coochbehar			Kalimpong	Pratapgarh			National average*		
	2018	2020	Mean	2020	2018	2020	Mean	2018	2020	Mean
JRF 2+	15.02	12.19	13.61	12.79	13.19	13.38	13.29	14.11	12.79	13.45
JRF-15	10.50	10.42	10.46	11.10	14.00	13.98	13.99	12.25	11.83	12.04
JRF-16	16.99	13.25	15.12	13.81	13.34	13.52	13.43	15.17	13.53	14.35
JRF-17	15.09	11.75	13.42	13.18	14.64	14.64	14.64	14.87	13.18	14.03
JRF-18	13.10	11.52	12.31	11.97	13.63	13.54	13.59	13.37	12.35	12.9
G. Mean	14.14	11.83	12.99	12.57	13.76	13.81	13.79	13.95	12.74	13.35
F test	*HS*	*Sig.*	*NS*	*HS*	*NS*	*Sig.*	*NS*	*Sig.*	*Sig.*	*Sig.*
SEm±	0.83	0.56	0.46	0.41	0.78	0.78		4.06	0.33	0.32
$LSD_{p=0.5}$	2.57	1.61	1.29	1.18	2.40	2.23	1.38	11.58	0.93	0.92
CV (%)	0.83	8.84	10.75	6.09	0.78	10.47	10.88	0.57	8.8	10.83

+; check variety, *; Kalimpong data not included in pooled analysis due to 1 year data.

Barrackpore: At this location sowing was done on 20.05.2020 and after 31 days of field duration harvesting was done on 20.06.2020. No significant difference for leaf yield was observed among entries. Check variety JRO 204 recorded highest leaf yield (196.5 q/ha) followed by JROV 5 (180.2 q/ha) and JROV-3 (176.3 q/ha).

Considering mean performance over years, significant differences among entries were observed. Again check variety JRO 204 recorded highest leaf yield of 157 q/ha followed by JROV 5 (152.35 q/ha) and JROV-3 (151.06 q/ha).

Coochbehar: At this location sowing was done on 18.05.2020 and after 32 days of crop duration harvesting was done on 19.06.2020. Significant difference for leaf yield was observed among entries. Test entry JROV-3 recorded highest leaf yield (116.4 q/ha) followed by JROV-5 (111.0 q/ha) and check variety JRO 524 (109.6 q/ha). These test entries were on par with best check JRO 524.

Based on mean performance over years, check variety JRO 524 recorded highest foliage yield (114.3 q/ha) followed by JROV-3 (112.8 q/ha) and JROAL-1 (112.5 q/ha). Entries were significantly different.

Kalyani: Sowing of the trial was done on 22.04.2020 at this location and harvesting was done after 32 days on 24.05.2020. Significant difference was observed among entries. Check variety JRO 524 recorded highest leaf yield (118.6 q/ha) followed by JRO 204 (111.1 q/ha), JROV-5 (110.3 q/ha) and JROV-3 (108.5 q/ha).

As per the analysis of mean performance over years, again check variety JRO 204 recorded highest leaf yield (122.9 q/ha) followed by check variety JRO 524 (118.8 q/ha). Highly significant difference among entries was observed.

Katihar: Sowing of the trial was done on 14.05.2020 at this location and harvested on 17.06.2020 after 34 days of sowing. Highly significant difference was observed among entries. Test entry JROV-5 recorded highest leaf yield (262.3 q/ha) followed by JROAL-1 (247.5 q/ha) and check variety JRO 204 (245.1 q/ha).

Based on analysis of mean performance over years, test entry JROV-5 recorded highest leaf yield (218.2 q/ha) followed by JROAL-1 (216.2 q/ha), BCCO-19 (212.8 q/ha) and JRO 204 (211.1 q/ha). Significant difference among entries was observed.

Nagaon: Sowing was done on 25.04.2020 at this location and crop was harvested after 30 days on 25.05.2020. No significant difference among entries was observed. Data was not included in pooled analysis due to low foliage yield.

Table 1.27 Pooled data of AVT-I (2019) and AVT-II (2020) with *C. olitorius* jute for leafy vegetables (fresh vegetable yield q/ha)

Entry	Barrackpore			Coochbehar			Kalyani			Katihar			Nagaon			National average*		
	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean	2019	2020	Mean
BCCO-19	116.0	166.0	141.0	114.0	108.1	111.1	93.66	107.1	100.4	182.6	243.0	212.8	45.0	52.2	48.6	126.6	156.1	141.3
JRO 204+	117.6	196.5	157.0	107.1	107.7	107.4	134.8	111.1	122.9	177.0	245.1	211.1	42.0	90.1	66.1	134.1	165.1	149.6
JRO 524+	124.5	174.4	149.4	118.9	109.6	114.3	118.9	118.6	118.8	186.3	226.1	206.2	42.4	45.0	43.7	137.1	157.2	147.2
JROAL-1	116.2	135.8	125.9	121.2	103.8	112.5	84.23	101.6	92.9	184.8	247.5	216.2	44.7	50.0	47.3	126.6	147.2	136.9
JROV-3	125.8	176.3	151.0	109.4	116.4	112.9	104.7	108.5	106.6	190.4	228.4	209.4	38.7	54.4	46.6	132.6	157.4	144.9
JROV-5	124.5	180.2	152.3	111.1	111.0	111.0	121.3	110.3	115.8	174.1	262.3	218.2	40.2	41.9	41.0	132.7	165.9	149.3
G. Mean	120.8	171.5	146.1	113.6	109.4	111.5	109.6	109.5	109.6	182.5	242.1	212.3	42.2	55.6	48.9	131.6	158.1	144.9
F test	*NS*	*NS*	*Sig.*	*Sig.*	*Sig.*	*Sig.*	*HS*	*Sig.*	*HS*	*NS*	*HS*	*Sig.*	*NS*	*NS*	*NS*	*Sig.*	*HS*	*HS*
SEm±	9.14	12.15	7.60	3.10	2.28	1.92	4.39	5.99	3.71	6.59	3.30	3.68	2.97	12.26	9.16	3.12	3.53	3.33
LSD $_{p=0.5}$	-	-	22.43	9.79	7.17	5.68	13.84	18.86	10.95	-	10.41	10.88	-	-	-	8.92	10.09	6.63
CV (%)	13.11	12.27	12.74	4.74	3.60	4.23	6.94	9.47	8.30	6.26	2.36	4.25	12.21	38.18	31.60	8.22	7.74	7.97

+; check varieties, *; Pooled analysis excluding Nagaon centre

National average: In 2019 under AVT-I trial highly significant difference among entries was observed and based on pooled data excluding Nagaon centre check variety JRO 524 (137.1 q/ha) significantly out yielded test entries for foliage yield which was followed by JRO 204 (134.1 q/ha), JROV-5 (132.7 q/ha) and JROV-3 (132.6 q/ha).

In 2020 under AVT-II trial highly significant difference among entries was observed when compared across locations. Test entry JROV-5 (165.9 q/ha) recorded highest leaf yield closely followed by check variety JRO 204 (165.1 q/ha).

Analysis of mean over locations and years mean (grand mean) suggested highly significant difference among entries. Check variety JRO 204 recorded highest leaf yield (149.6 q/ha) followed by JROV-5 (149.3 q/ha) and JRO 524 (147.2 q/ha).

NP(MB) 3.6: AVT-II with roselle (*H. subdariffa*) for fresh calyx production

The trial was constituted with four test entries and two check varieties namely, HS 4288 and AMV 5 and conducted over three locations i.e., Aduthurai, Amadalavalasa and Rahuri but two test entries did not germinate either at one or all locations. Location wise results are discussed below and fresh calyx yield data are presented in table 1.28.

Fresh harvested calyx at Rahuri

Aduthurai: At this location sowing was done on 19.06.2020 and mature calyxes were harvested periodically. Test entries AHC-2 and HSLC-2 not germinated at this centre. Both test entries viz. HSLC-1 (37.83 q/ha) and AHC-1 (33.67 q/ha) significantly out yielded the best check HS 4288 (14.83 q/ha) for calyx yield. Highly significant differences for calyx yield were observed among entries.

Based on pooled analysis over years, test entry viz. AHC-1 (32.09 q/ha) was better performing followed by HSLC-1 (31.67 q/ha) and check HS 4288 (13.75 q/ha) for calyx yield. Highly significant differences for calyx yield were observed.

Table 1.28 Pooled data of AVT-I (2019) and AVT-II (2020) with roselle for calyx production (fresh calyx yield in q/ha)

Entry	Aduthurai			Amadalavalasa		Rahuri			National average		
	2019	2020	Mean	2019	2020	2019	2020	Mean	2019*	2020	Mean*
AHC-1	30.50	33.67	32.09	2.99	27.02	40.34	62.03	51.19	35.42	40.91	38.16
AHC-2	31.17	-	-	4.99	-	46.09	-	-	38.63	-	-
AMV 5+	10.17	14.33	12.25	1.99	26.61	33.68	27.80	30.74	21.93	22.91	22.42
HS 4288+	12.67	14.83	13.75	5.46	24.36	40.40	23.23	31.82	26.54	20.81	23.67
HSLC-1	25.50	37.83	31.67	11.13	30.93	58.67	61.30	59.99	42.09	43.35	42.72
HSLC-2	33.00	-	-	6.19	7.31	51.57	57.33	54.45	42.29	32.32	-
G. Mean	23.83	20.13	22.44	5.46	23.24	45.13	46.34	43.43	34.48	32.06	31.75
F test	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*	*HS*
SEm±	0.74	1.30	0.82	0.382	1.70	3.37	3.22	2.87	1.73	1.24	1.39
$LSD_{p=0.5}$	2.32	4.50	2.38	1.21	5.54	10.62	10.52	8.21	5.09	3.69	4.05
CV (%)	5.35	8.96	8.44	12.21	12.67	12.93	12.06	15.03	12.25	11.65	14.59

+; check variety, *; Amadalavalasa centre not included in pooled analysis due to wide deviation in data over years.

Amadalavalasa: The trial was sown on 22.06.2020 at this location and fresh calyxes were harvested periodically. Test entry HSLC-1 (30.93 q/ha) recorded highest calyx yield followed by AHC-1 (27.02 q/ha) and check variety AMV 5 (26.61 q/ha) which were not significantly different. Highly significant difference was observed among entries. Due to wide deviation in data over years, pooled analysis over year was not done.

Rahuri: The experiment was sown on 11.07.2020 and mature calyxes were harvested periodically at certain intervals. Highly significant difference was observed among entries. Test entry AHC-1 (62.03 q/ha) recorded highest calyx yield followed by HSLC-1 (61.30 q/ha), HSLC-2 (57.33 q/ha) and check variety AMV 5 (27.80 q/ha).

Considering pooled analysis over years, test entries HSLC-1 (59.99 q/ha), HSLC-2 (54.45 q/ha) and AHC-1 (51.19 q/ha) significantly out yielded the best check HS 4288 (31.82 q/ha) for calyx yield.

AVT-II with roselle for calyx at Rahuri

National average: In 2019 under AVT-I trial highly significant difference among entries was observed and based on pooled data excluding Amadalavalasa centre test entries HSLC-2 (42.29 q/ha), HSLC-1 (42.09 q/ha), AHC-2 (38.63 q/ha) and AHC-1 (35.42 q/ha) significantly out yielded best check HS 4288 (26.54 q/ha) for fresh calyx yield.

In 2020 under AVT-II trial highly significant difference among entries was observed when compared across locations. Test entries HSLC-1 (43.35 q/ha), AHC-1 (40.91 q/ha) and HSLC-2 (32.32 q/ha) significantly out yielded the best check AMV 5 (22.91 q/ha) for fresh calyx yield.

Analysis of mean over locations and years (grand mean) suggested highly significant difference among entries. Test entries HSLC-1 (42.72 q/ha) and AHC-1 (38.16 q/ha) significantly out yielded best check HS 4288 (23.67 q/ha) for fresh calyx yield.

During 2020 crop season, a total of 19 projects comprising of 60 trials were conducted under crop production programme of which 26 trials were under jute, 10 trials were under mesta, 04 trials were under sunnhemp, 05 trials were under ramie, 085 trials were under sisal and 06 trials were under flax crop, respectively.

Project NP (JA) 6. 19: Nutrient management for jute / mesta based cropping system

The experiment was alloted to Katihar, Bihar for jute under rain fed condition and to Aduthurai, Tamil Nadu for mesta under irrigated condition and the centre wise data are presented below:

Katihar: The trial with jute failed due to excess waterlogging in the experimental field because of high rainfall as well as poor drainiage condition.

Aduthurai: Perusal of data revealed that all the treatments recorded significantly higher plant height, and fibre yield of mesta over control (table 2.1). Maximum plant height (260.7 cm), basal diameter (2.87 cm) and fibre yield (30.13 q/ha) were recorded in T_6 [100% NPK on ST-TY (3.2 t/ha) +FYM] treatment. Application of recommended dose of fertilizer (RDF) combined with organic manure significantly increased fibre yield of mesta by 12.9% over RDF. Targeted yield of mesta (3.2 t/ha) could not be achieved with fertilizer application based on soil test and targeted yield. Incorporation of FYM along with inorganic fertilizer on the basis of soil test and target yield helped in achieving the targeted yield of mesta with (-) 5.8% yield deviation. Highest uptake of nitrogen (61.67 kg/ha), phosphorus (36.62 kg/ha) and potassium (56.97 kg/ha) by mesta were recorded with T_6 treatment and the uptake values with T_6 treatment were significantly higher than those recorded with other treatments while the treatment effect on available nutrient status of experimental soil was found non-signifcant except in case of available soil P_2O_5 values (table 2.2).

INM in mesta at Aduthurai

Table 2.1 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)	210.1	2.30	21.50
T_2: Recommended dose of fertilizer (RDF)	228.0	2.35	23.21
T_3: Organic manure (equivalent to 5 t/ha of FYM)	233.7	2.37	25.01
T_4: RDF + organic manure (equivalent to 5 t/ha of FYM)	240.0	2.59	26.20
T_5: 100% NPK on ST-TY (Target: mesta – 3.2 t/ha, rice – 4.0 t/ha)	254.0	2.67	27.15
T_6: T_5 + organic manure (equivalent to 5 t/ha of FYM)	260.7	2.87	30.13
T_7: 150% RDF	244.1	2.56	25.63
SEm±	3.5	0.04	0.45
$CD_{(P=0.05)}$	10.3	0.11	1.33

Table 2.2 Effect of integrated nutrient management in mesta on available nutrient status of soil at Aduthurai, Tamil Nadu

Treatments	Available nutrient at harvest (kg/ha)			Nutrient uptake (kg/ha)		
	N	P_2O_5	K_2O	N	P	K
T_1: Control (without any fertilizer / organic manure)	174.91	60.97	148.07	49.97	24.90	38.90
T_2: Recommended dose of fertilizer (RDF)	176.92	54.12	140.45	48.42	27.05	42.60
T_3: Organic manure (equivalent to 5 t/ha of FYM)	172.78	52.25	145.97	48.40	27.02	46.45
T_4: RDF + organic manure (equivalent to 5 t/ha of FYM)	175.25	51.60	143.97	48.40	26.22	45.65
T_5: 100% NPK on ST-TY (Target: mesta – 3.2 t/ha, rice – 4.0 t/ha)	178.37	54.45	145.05	50.27	26.30	46.27
T_6: T_5 + organic manure (equivalent to 5 t/ha of FYM)	182.47	55.50	144.20	61.67	36.62	56.97
T_7: 150% RDF	175.95	52.47	149.27	50.15	24.85	44.25
SEm±	2.74	1.68	2.19	1.52	1.40	1.73
$CD_{(P=0.05)}$	NS	4.98	NS	4.51	4.15	5.13

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

The experiment for jute was conducted at Coochbehar and Nagaon centres whereas the experiment for mesta was conducted at Amadalavalasa centre with an objective to develop an integrated nutrient management system for both jute and mesta based cropping systems under acidic soil condition and the centre wise results are presented below:

Coochbehar: Application of recommended dose of fertilizer (RDF) increased the fibre yield of jute significantly over control. Incorporation of organic manure along with RDF improved the fibre yield of the crop further though the treatment had no significant effect over RDF (table 2.3). Application of fertilizers on soil test and targeted yield basis with FYM and lime significantly increased the plant height, basal diameter and fibre yield of jute. Maximum plant height (261.7 cm) and fibre yield of jute (27.48 q/ha) were recorded with T_{12} treatment while maximum basal diameter (1.33 cm) was found with T_{11} treatment. Application of inorganic fertilizer on the basis of soil test and targeted yield approach (100 % NPK on ST-TY) could not achieve the target yield of jute (4.0 t/ha). Increasing the fertilizer dose to 150% NPK on ST-TY approach also could not achieve the yield target. Though the targeted yield of jute (4.0 t/ha) could not be achieved, the targeted yield of rice (5.0 t/ha) was achieved when inorganic fertilizer based on ST-TY approach was applied both at 100% and 150% levels, either alone or in combination with FYM and lime. The highest grain yield of rice (60.43 q/ha) was observed with T_{12} (150% NPK on ST-TY + 25% LR +FYM @ 5 t/ha) treatment (table 2.3). The available nutrient status of experimental soil was improved in plots receiving soil test based fertilizer application alone or in combination with FYM and / or lime both at 100% and 150% ST-TY level compared to 100% RDF treatment at Coochbehar (table 2.4).

Table 2.3 Yield attributes and fibre yield of jute and grain yield of rice under integrated nutrient management system on acid soil at Coochbehar, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)	Rice grain yield (q/ha)	Rice straw yield (q/ha)
$T_{1:}$ Control (without any fertilizer / organic manure)	163.0	0.86	12.08	22.46	31.80
T_2 : 100% Recommended Fertilizer Dose (RDF)	220.8	1.01	19.67	44.13	53.20
T_3 : 100% RDF + lime / dolomite application on 25% LR (lime requirement)	221.0	1.03	19.60	41.28	52.85
T_4 : 100% RDF + organic manure (equivalent to 5 t/ha of FYM)	221.4	1.00	21.00	46.01	58.46
T_5 : 100% NPK on ST-TY	227.3	1.08	24.57	50.96	62.63
T_6 : 100% NPK on ST-TY + lime / dolomite application on 25% LR	226.6	1.18	25.15	54.60	65.53
T_7 : 100% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	225.5	1.29	25.90	54.96	68.56
T_8 : 100% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	224.2	1.27	26.39	58.57	67.46
T_9 : 150% NPK on ST-TY	225.8	1.26	25.23	50.44	65.16
T_{10}: 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	233.3	1.26	26.92	59.83	72.00
T_{11}: 150% NPK on ST-TY + lime / dolomite application on 25% LR	234.0	1.33	26.30	59.63	74.06
T_{12}: 150% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	261.7	1.32	27.48	60.43	75.86
SEm±	13.9	0.08	1.62	3.22	4.28
$CD_{(P=0.05)}$	40.7	0.23	4.74	9.43	12.54

Table 2.4 Available nutrient of soil and nutrient uptake by jute under integrated nutrient management on acid soils at Coochbehar, West Bengal

Treatments	Available nutrient (kg/ha) at harvest			Nutrient uptake (kg/ha)		
	N	P_2O_5	K_2O	N	P	K
$T_{1:}$ Control (without any fertilizer / organic manure)	58.74	9.22	48.69	163.50	17.76	100.91
T_2 : 100% Recommended Fertilizer Dose (RDF)	62.40	12.12	68.85	188.24	20.10	115.36
T_3 : 100% RDF + lime / dolomite application on 25% LR (lime requirement)	64.25	13.80	69.90	191.20	19.20	112.22
T_4 : 100% RDF + organic manure (equivalent to 5 t/ha of FYM)	68.66	13.20	70.67	193.47	21.78	120.10
T_5 : 100% NPK on ST-TY	71.08	14.20	72.45	190.00	20.45	122.01
T_6 : 100% NPK on ST-TY + lime / dolomite application on 25% LR	74.28	14.62	73.06	187.60	19.94	120.15
T_7 : 100% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	74.80	15.60	73.44	193.24	19.04	117.00
T_8 : 100% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	76.39	16.10	73.85	190.30	20.56	117.90
T_9 : 150% NPK on ST-TY	80.10	16.51	75.25	187.67	19.46	121.60
T_{10}: 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	79.39	17.80	77.75	187.00	18.60	120.44
T_{11}: 150% NPK on ST-TY + lime / dolomite application on 25% LR	79.57	18.36	78.90	181.57	18.36	114.43
T_{12}: 150% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	82.20	18.58	81.43	175.14	19.25	110.89

Nagaon: The experiment on integrated nutrient management was conducted on acid soil of Nagaon, Assam. Results revealed that all the treatments increased the height and basal diameter of the plant though the increase was not statistically significant (table 2.5). All the nutrient management treatments except 100% RDF (recommended dose of fertilizer) recorded significantly higher fibre yield of jute over control (table 2.5). Application of inorganic fertilizer alone, both at 100 and 150% ST-TY levels, could not achieve the targeted yield of jute (4.0 t/ha) where as the same yield target was achived when lime (@ 25% LR) and organic manure (@ 5 t/ha) were integrated with soil test based fertilizer application both at 100 and 150% levels. Highest fibre yield (38.81 q/ha) was recorded with T_{12} treatment (150% NPK on ST-TY + lime @ 25% LR + organic manure @ 5 t/ha) (table 2.5). The target yield of rice (4 t/ha) could not be achieved through application of inorganic fertilizer alone or in combination with lime and organic manure, both at 100 and 150% ST-TY levels. Maximum rice grain yield (3.3 t/ha) was recorded in T_{11} treatment (150% NPK on ST-TY + lime @ 25% LR). Maximum nutrient uptake by jute was recorded with T_{12} treatment (table 2.6).

Table 2.5 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)	Rice grain yield (q/ha)
T_1: Control (without any fertilizer / organic manure)	326.0	1.48	25.03	26.83
T_2 : 100% Recommended Fertilizer Dose (RDF)	366.3	1.68	29.93	30.83
T_3 : 100% RDF + lime / dolomite application on 25% LR (lime requirement)	349.3	1.50	32.01	31.83
T_4 : 100% RDF + organic manure (equivalent to 5 t/ha of FYM)	376.3	1.53	31.76	29.66
T_5 : 100% NPK on ST-TY	389.0	1.74	31.09	31.50
T_6 : 100% NPK on ST-TY + lime / dolomite application on 25% LR	372.3	1.52	33.71	32.16
T_7 : 100% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	367.6	1.59	32.59	30.16
T_8 : 100% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	386.0	1.61	36.16	32.00
T_9 : 150% NPK on ST-TY	391.0	1.75	35.65	32.83
T_{10}: 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	367.6	1.66	37.62	31.16
T_{11}: 150% NPK on ST-TY + lime / dolomite application on 25% LR	369.3	1.60	38.31	33.00
T_{12}: 150% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	388.0	1.66	38.81	32.96
SEm±	15.9	0.10	1.79	0.55
$CD_{(P=0.05)}$	NS	NS	5.24	1.61

Table 2.6 Available nutrient of soil and nutrient uptake by jute under integrated nutrient management on acid soils at Nagaon, Assam

Treatments	Available nutrient (kg/ha) at harvest			Nutrient uptake (kg/ha)		
	N	P_2O_5	K_2O	N	P	K
T_1: Control (without any fertilizer / organic manure)	276.73	19.93	133.16	65.09	19.78	39.05
T_2 : 100% Recommended Fertilizer Dose (RDF)	278.66	20.10	125.13	77.82	23.64	46.69
T_3 : 100% RDF + lime / dolomite application on 25% LR (lime requirement)	289.86	16.83	133.26	83.22	25.28	49.93
T_4 : 100% RDF + organic manure (equivalent to 5 t/ha of FYM)	272.49	18.10	115.96	82.59	25.09	49.55
T_5 : 100% NPK on ST-TY	279.10	17.96	115.13	80.84	24.56	48.50
T_6 : 100% NPK on ST-TY + lime / dolomite application on 25% LR	273.16	18.56	114.36	87.66	26.63	52.59
T_7 : 100% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	282.20	17.53	114.76	84.72	25.74	50.83
T_8 : 100% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	271.60	17.33	113.33	94.02	28.57	56.41
T_9 : 150% NPK on ST-TY	281.23	17.16	116.50	92.69	28.16	55.61
T_{10}: 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	281.10	16.30	124.83	97.82	29.72	58.69
T_{11}: 150% NPK on ST-TY + lime / dolomite application on 25% LR	279.53	18.16	124.63	99.62	30.27	59.77
T_{12}: 150% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	278.90	17.80	128.30	100.92	30.66	60.55
SEm±	7.23	1.18	5.04	4.65	1.41	2.79
$CD_{(P=0.05)}$	NS	NS	NS	13.62	4.13	8.17

Amadalavalasa: All the nutrient management treatments significantly enhanced plant height, basal diameter, plant population, green weight and fibre yield of mesta in acid soil over control. Application of recommended dose of fertilizer (RDF) combined with organic manure (T_4) increased yield of mesta over RDF treatment but the effect was not significant (table 2.7). Application of fertilizer on soil test and targeted yield basis (100% NPK on ST-TY) either alone or in combination with organic manure and/or lime achieved the target yield of mesta. Among different nutrient management treatments, maximum plant height (350 cm), plant population (3.01 lakh/ha), green weight (697.51 q/ha) and dry fibre yield (41.86 q/ha) were recorded under T_8 treatment (100% NPK on ST-TY + lime+ FYM @ 5 t/ha) followed by T_{12} and T_7 treatments, respectively (table 2.7).

INM in mesta at Amadalavalasa

Table 2.7 Yield attributes and fibre yield of mesta under integrated nutrient management system in acid soil at Amadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Plant population (lakh/ha)	Green weight (q/ha)	Fibre yield (q/ha)
T_1: Control (without any fertilizer / organic manure)	205.3	1.35	2.38	108.18	6.51
T_2 : 100% Recommended Fertilizer Dose (RDF)	265.0	1.96	2.90	361.19	21.37
T_3 : 100% RDF + lime / dolomite application on 25% LR (lime requirement)	305.0	2.01	2.96	422.77	24.87
T_4 : 100% RDF + organic manure (equivalent to 5 t/ha of FYM)	310.0	2.15	3.01	470.90	27.65
T_5 : 100% NPK on ST-TY	310.0	2.21	2.92	461.74	27.23
T_6 : 100% NPK on ST-TY + lime / dolomite application on 25% LR	320.0	2.31	2.95	484.17	28.45
T_7 : 100% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	330.0	2.45	3.00	592.93	35.38
T_8 : 100% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	350.0	2.57	3.01	697.51	41.86
T_9 : 150% NPK on ST-TY	330.0	2.32	2.94	491.61	30.12
T_{10}: 150% NPK on ST-TY + organic manure (equivalent to 5 t/ha of FYM)	350.0	2.51	2.99	518.12	33.09
T_{11}: 150% NPK on ST-TY + lime / dolomite application on 25% LR	340.0	247	2.95	485.09	30.11
T_{12}: 150% NPK on ST-TY + lime / dolomite application on 25% LR+ organic manure (equivalent to 5 t/ha of FYM)	350.3	2.62	2.99	594.20	35.65
SEm±	9.5	0.09	0.01	39.13	2.37
$CD_{(P=0.05)}$	27.8	0.26	0.02	114.65	6.94

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

The experiment was conducted to develop the integrated weed management schedule for jute at Kalyani, Coochbehar, Nagaon, Kendrapara, and Katihar; for mesta at Amadalavalasa and Aduthurai; and for jute seed crop at Rahuri, Maharashtra. The centre-wise results are presented below.

Jute: Kalyani, Coochbehar, Kendrapara, Katihar, Nagaon, Amadalavalasa, Aduthurai, Rahuri

Kalyani: Perusal of experimental data revealed the all weed control treatments significantly increased the basal diameter and fibre yield of jute and also decreased the weed biomass compared to unweeded check (table 2.8). Maximum value of plant height (371.6 cm), basal diameter (1.67 cm) and fibre yield (31.04 q/ha) were recorded with T_9 (two hand weeding / mechanical weeding) treatment, respectively. The fibre yield of jute recorded with T_9 treatment was closely followed by yield (30.23 q/ha) with T_3 (Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @100 g/ha at 15 DAE) treatment though there was significant variation in fibre yield of the crop among all the weed control treatments (table 2.8). Weed biomass at 15 DAE was minimum with the T_9 (two hand weeding / mechanical weeding) followed by T_1 (Pretilachlor 50%EC 900 ml/ha at 45-48 hrs of sowing with irrigation + one hand weeding at 15 DAE) treatments (0.11 & 0.13 q/ha) while at 35 DAE, minimum weed dry biomass were recorded with T_9 (0.19 q/ha) followed by T_3 (0.21 q/ha) and T_4 (0.25 q/ha) treatments, respectively. The highest weed control efficiency (79.08 %) was also recorded with T_1 treatment followed by T_7 (72.60 %) (CRIJAF Nail Weeder) treatment (table 2.8). The highest cost of cultivation (Rs 91000/ha) was recorded with T_4 (Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @ 50 g/ha at 15 DAE + one hand weeding at 30 DAE) treatment followed by T_9 (Rs. 85600/ha) (two hand weeding) treatment, while, maximum net return (Rs. 59141/ha) was recorded with T_7 treatment followed by T_3 (Rs. 58382/ha) and T_9 (Rs. 56830/ha) treatments, respectively. The highest B:C

ratio (1.84) was recorded with T_7 treatment followed by T_3 (1.73), T_9 (1.66) and T_2 (1.66) treatments, respectively, at Kalyani, West Bengal (table 2.9). The pool analysis of 3 years data (2018-20) revealed that fibre yield recorded with T_3 treatment (Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE) (31.56 q/ha) was at statistically par with T_7 treatment (Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE) (30.16 q/ha) and both the treatments recorded significantly higher fibre yield of jute over other other weed control treatments and also higher net return and are recommended for south Bengal region.

Table 2.8 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)	Fibre yield (q/ha) (2020)	Pool (2018-2020)	Weed dry matter (q/ha) 15 DAE	Weed dry matter (q/ha) 35 DAE	WCE (%)
T_1: Pretilachlor 50% EC 900 g/ha at 45-48 hrs of sowing with irrigation + one hand weeding (15DAE)	344.0	1.41	27.36	25.37	0.13	0.28	79.08
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	350.0	1.50	28.56	28.05	0.24	0.26	60.72
T_3: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	364.6	1.58	30.23	31.56	0.28	0.21	54.27
T_4: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW (30 DAE)	353.3	1.46	28.81	28.53	0.33	0.25	39.88
T_5: Propaquizafop 10% EC @ 90 g/ha at 15 DAE + One HW (30 DAE)	342.3	1.41	27.27	24.82	0.31	0.32	36.13
T_6: Pendimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one hand weeding (15 DAE)	328.3	1.36	26.71	23.45	0.21	0.35	49.82
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE	361.0	1.49	28.16	30.16	0.27	0.27	72.60
T_8: Unweeded check	318.3	1.19	20.25	18.10	0.34	0.59	0.00
T_9: Two HW/MW (nail weeder) at 15-20 DAE and 35-40 DAE	371.6	1.67	31.04	27.96	0.11	0.19	69.85
SEm±	5.3	0.03	1.69	0.84	0.01	0.05	--
$CD_{(P=0.05)}$	15.8	0.08	5.05	1.68	0.02	0.14	--

HW: hand weeding; MW: mechanical weeding: WCE: Weed control efficiency

Table 2.9 Economics of weed control methods in jute at Kalyani, West Bengal

Treatment	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
T_1: Pretilachlor 50% EC 900 g/ha at 45-48 hrs of sowing with irrigation + one HW (15 DAE)	77350	125461	48111	1.62
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	79100	130981	51881	1.66
T_3: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	80300	138682	58382	1.73
T_4: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW (30 DAE)	91000	132139	41139	1.45
T_5: Propaquizafop 10% EC @ 90 g/ha at 15 DAE + One HW (30 DAE)	80450	125188	44738	1.56
T_6: Pendimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	79350	122530	43180	1.54
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE	70000	129141	59141	1.84
T_8: Unweed check	66000	92886	26886	1.41
T_9: Two HW/MW (nail weeder) at 15-20 DAE and 35-40 DAE	85600	142430	56830	1.66

HW: Hand weeding; MW: mechanical weeding; MSP of jute : Rs. 4225/q

Coochbehar: The weed control treatments did not significantly affect the plant height and basal diameter of jute at Coochbehar, West Bengal. Maximum fibre yield of jute (26.85 q/ha) was recorded with T_4 treatment (quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @ 50 g/ha at 15 DAE + one hand weeeding at 30 DAE) which was at par with fibre yield recorded with T_2, T_3 and T_9 treatments (24.46 to 25.73 q/ha) (table 2.10). Significant reduction in weed dry biomass was recorded by all weed control treatment compared to unweeded control and lowest weed biomass was recorded with T_4 treatment at all the stages (0.22 to 0.76 q/ha) (table 2.11) followed by T_9, T_3, T_2 and T_1 treatments. The weed control efficiency was maximum with T_4 treatment (90.3%) and was in the order $T_4 > T_9 > T_3 > T_2 > T_1$, respectively (table 2.11). Maximum gross return (Rs. 99370/ha) was recorded with T_4 treatment followed by T_9, T_3 and T_2 treatments, respectively while maximum net return (Rs. 59174/ha) was recorded with T_4 treatment followed by T_3 and T_2 treatments. Similarly maximum B:C ratio (2.47) was recorded with T_4 treatment followed by T_7, T_3 and T_2 treatments, respectively at Coochbehar, West Bengal (table 2.12). The pool analysis of 3 years data (2018-20) revealed that fibre yield recorded with T_4 treatment (Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW at 30 DAE) (30.28 q/ha) was at statistically par with T_9 (two hand weeding) (30.16 q/ha) and also with T_3, T_2 and T_1 treatments (table 2.10). Cosidering the higher fibre yield (pool data) of jute as well as higher net return (Rs. 59174/ha recorded over other other weed control treatments, application of Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW at 30 DAE is recommended for weed control in jute in north Bengal region.

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Table 2.10 Yield attributes and fibre yield of jute under different weed control methods at Coochbeher, West Bengal

Treatments	Plant height (cm)	Basal diameter (cm)	Green weight (q/ha)	Fibre yield (q/ha)	
				2020	Pool*
T_1: Pretilachlor 50% EC @ 900 g/ha at 45-48 hrs of sowing with irrigation + one HW (15 DAE)	227.6	1.04	421.43	21.10	26.41
T_2: Quizalofop ethyl 10% EC @38 g/ha at 15 DAE + one HW (30 DAE)	228.6	1.06	472.16	24.46	28.61
T_3: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	229.3	1.02	481.26	25.53	28.83
T_4: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @50 g/ha at 15 DAE + one HW (30 DAE)	239.3	1.10	536.50	26.85	30.28
T_5: Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	226.5	0.95	353.40	19.30	27.14
$1T_6$: Pendimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	216.2	0.98	390.86	19.48	25.27
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE	218.4	0.99	408.56	20.10	25.37
T_8: Unweed check	198.9	0.78	246.73	12.05	16.44
T_9: Two HW/MW(nail weeder) at 15-20 DAE and 35-40 DAE	234.7	1.09	513.33	25.73	30.05
SEm±	11.5	0.10	30.35	1.90	1.96
$CD_{(P=0.05)}$	NS	NS	90.74	5.68	3.93

NB: HW: hand weeding; MW: mechanical weeding; * pool of 2018, 2019 & 2020

Table 2.11 Weed dry biomass, weed control efficiency and weed index under different weed control methods at Coochbeher, West Bengal

Treatments	Weed dry matter (q/ha)			WCE (%)			WI (%)
	15 DAE	30 DAE	45 DAE	15 DAE	30 DAE	45 DAE	
T_1: Pretilachlor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	0.39	0.85	0.95	82.37	70.64	69.63	21.43
T_2: Quizalofop ethyl 10% @ 38 g/ha at 15 DAE + one HW (30 DAE)	0.39	0.68	0.89	82.19	76.29	71.43	8.90
T_3: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @100g/ha at 15 DAE	0.29	0.63	0.77	86.72	78.31	75.42	4.93
T_4: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	0.22	0.51	0.76	90.34	82.21	75.54	0.00
T_5: Propaquizafop 10 EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	0.70	1.53	2.10	68.90	47.26	34.18	28.14
T_6 :Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	0.51	1.41	1.95	77.01	51.31	39.88	27.44
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g/ha at 25 DAE	0.44	1.37	1.88	80.69	52.72	41.78	25.16
T_8: Un-weeded control	2.29	2.90	3.26	0.00	0.00	0.00	55.13
T_9: Two HW / MW (nail weeder) at 15-20 DAE and 35-40 DAE	0.28	0.53	0.77	87.70	81.62	75.48	4.20
SEm±	0.07	0.04	0.18	--	--	--	--
$CD_{(P=0.05)}$	0.20	0.11	0.53	--	--	--	--

HW: hand weeding; MW: mechanical weeding: WCE: Weed control efficiency: WI: Weed Index

Table 2.12 Economics of weed control methods in jute at Coochbeher, West Bengal

Treatment	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C ratio
T_1: Pretilachlor @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	48992	78070	29078	1.59
T_2: Quizalofop ethyl 10% @ 38 g/ha at 15 DAE + one HW (30 DAE)	47332	90527	43195	1.91
T_3: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron 15 WDG @100g/ha at 15 DAE	48821	94473	45652	1.94
T_4: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron@ 50 g/ha at 15 DAE + one HW (30 DAE)	40196	99370	59174	2.47
T_5: Propaquizafop 10 EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	43250	71410	28160	1.65
T_6 :Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	38452	72101	33649	1.88
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g at 25 DAE	37560	74370	36810	1.98
T_8: Un-weeded control	33016	44583	11567	1.35
T_9: Two HW / MW (nail weeder) at 15-20 DAE and 35-40 DAE	60132	95201	35069	1.58

HW: hand weeding; MW: mechanical weeding: WCE: Weed control efficiency; MSP of Jute @ Rs. 4225/q

Nagaon: The effect of weed control treatments was non-significant on plant height and plant population while it was significant on basal diameter and fibre yield of jute at Nagaon, Assam, though the average fibre yield across the treatments were low due to excess rainfall and poor drainage at the later stage of crop growth (table 2.13). Most of the weed control treatments recorded significantly higher fibre yield of jute over unweeded control and maximum fibre yield was recorded

with T_3 treatment (quizalofop ethyl 5% EC @ 60 g/ha + ethoxysulfuron @ 100 g/ha at 15 DAE) (23.86 q/ha) which was statistically at par with fibre yield recorded with T_1 (pretilachlor 50% EC @ 900 g/ha + one hand weeding at 15 DAE) and T_2 (quizalofop ethyl 10% EC @ 38 g/ha + one hand weeding at 15 DAE) treatments. All the three treatments (T_1, T_2 and T_3) were ststistically at par with two hand weeding treatment in this regard. The weed dry matter recorded with different weed control treatments at different dates of emergence were in the order - $T_2 < T_1 < T_3$ at 15 DAE; $T_2 = T_3 < T_7$ at 35 DAE and $T_5 < T_9 < T_3 < T_1$ at 60 DAE, respectively. The weed control treatments showing higher weed control efficiency were – T_1, T_2 and T_3 at 15 DAE; T_2 and T_3 at 35 DAE and T_5, T_9 and T_3 at 60 DAE, respectively (table 2.14).

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Table 2.13 Yield attributes and fibre yield of jute under different weed control methods at Nagaon, Assam

Treatments	Plant height (cm)	Basal diameter (cm)	Plant population (lakh/ha)	Fibre yield (q/ha)
T_1: Pretilachlor 50% EC 900 g/ha at 45-48 hrs of sowing with irrigation + one HW (15DAE)	359.3	1.21	5.68	22.44
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	346.0	1.48	4.93	22.81
T_3: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @100 g/ha at 15 DAE	373.6	1.63	5.54	23.86
T_4: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @50 g/ha at 15 DAE + one HW (30 DAE)	362.0	1.66	5.28	21.00
T_5: Propaquizafop 10 EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	361.3	1.49	5.44	21.46
T_6: Pendimethalin 35% EC @525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	341.6	1.59	5.14	20.71
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g at 25 DAE	365.0	1.33	5.29	21.95
T_8: Unweed check	344.6	1.23	4.94	19.71
T_9: Two HW/ MW (nail weeder) at 15-20 DAE and 35-40 DAE	407.0	1.23	5.08	22.91
SEm±	18.9	0.04	0.23	0.62
$CD_{(P=0.05)}$	NS	0.11	NS	1.85

HW: hand weeding; MW: mechanical weeding

Kendrapara: The perusal of data revealed that the effect of weed control method was significant only on plant height, basal diameter, green weight and fibre yield of jute and all the weed control treatments recorded significantly higher value of all the parameters compared to unweeded check. Maximum value of basal diameter (1.66 cm), green weight (611.94 q/ha) and fibre yield (29.72 q/ha) were recorded with T_1 (Pretilachlor 50% EC @ 900 g/ha at 45-48 hrs of sowing with irrigation + one hand weeding at 15 DAE) treatment and it was statistically at par with T_2, T_3, T_4, T_7 treatments while maximum plant height (334.3 cm) was recorded with T_9 treatment (table 2.15). All the said treatments (T_1, T_2, T_3, T_4, T_7) were at par with T_9 (two hand weeding) treatment in this regard. Minimum weed biomass at 15 DAE was recorded with T_1 (1.54 q/ha) treatment which was statistically at par with T_7 and T_9 treatments, respectively. At 35 DAE, T_2 treatment recorded lowest weed dry matter (1.55 q/ha) which was on a par with T_1, T_4 and T_6 treatments while

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at 45 DAE minimum weed dry matter was recorded with T3 treatment (1.41 q/ha) statistically at par with T_2, T_9, T_7 and T_1 treatments, respectively (table 2.16). The weed control efficiency of the treatments imposed were in the order of T_1 (78.3%) > T_9> T_7> T_2 > T_3> T_4, respectively. Maximum net return (Rs. 62898/ha) and B:C ratio (2.22) was recorded with T_2 (nail weeder + quizalofop 5% EC) treatment closely followed by T_1 and T_4 treatments, respectively (table 2.17).

Table 2.14 Weed biomass and weed control efficiency under different weed control methods at Nagaon, Assam

Treatments	Weed dry matter (q/ha)			Weed control efficiency (%)		
	15 DAE	35 DAE	60 DAE	15 DAE	35 DAE	60 DAE
T_1: Pretilachlor 50% EC 900 g/ha at 45-48 hrs of sowing with irrigation + one HW (15DAE)	1.28	3.18	3.26	81.4	62.7	77.8
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	1.09	1.85	4.04	84.2	78.3	72.5
T_3: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @100 g/ha at 15 DAE	1.32	1.85	2.86	80.8	78.3	80.5
T_4: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @50 g/ha at 15 DAE + one HW (30 DAE)	1.49	2.59	3.98	78.3	69.6	72.9
T_5: Propaquizafop 10 EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	2.14	3.62	2.16	68.9	57.6	85.3
T_6: Pendimethalin 35% EC @525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	4.10	6.56	9.70	40.4	23.1	33.9
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g at 25 DAE	3.45	2.38	4.57	49.9	72.1	68.9
T_8: Unweed check	6.88	8.53	14.68	0.0	0.0	0.0
T_9: Two HW / Mechanical weeding (nail weeder) at 15-20 DAE and 35-40 DAE	1.85	5.04	2.31	73.1	40.9	84.3
SEm±	0.36	0.32	0.32	--	--	--
$CD_{(P=0.05)}$	1.07	0.95	0.95	--	--	--

HW: hand weeding; MW: mechanical weeding

The pool analysis of 3 years data (2018-20) revealed that fibre yield recorded with T_9 treatment (two hand weeding) (27.92 q/ha) was statistically par with T_4 (27.83 q/ha), T_7 (27.44 q/ha), T_1 (27.33 q/ha) and T_2 (26.83 q/ha) treatments (table 2.10). Cosidering both the higher fibre yield (pool data) of jute (27.33 – 27.44) as well as higher net return (Rs. 61134 - 62898/ha) recorded with Nail Weeder + quizalofop ethyl 5%EC @ 60 g at 25 DAE or application of pretilichlor 50% EC 900 g/ha at 45-48 hours of sowing with irrigation + one HW (15 DAE) are recommended for weed control in jute at Kendrapara, Odisha region.

Table 2.15 Yield attributes and fibre yield of jute under different weed control methods at Kendrapara, Odisha

Treatments	Plant height (cm)	Basal diameter (cm)	Green weight (q/ha)	Fibre yield (q/ha)	
				2020	Pool
T_1: Pretilichlor 50% EC 900 g/ha at 45-48 hours of sowing with irrigation + one HW (15 DAE)	332.3	1.66	611.94	29.72	27.33
T_2 : Quizalofopethyl 10% EC @ 38 g/ha at 15 DAE + one HW at 30 DAE	323.3	1.50	576.66	27.77	26.83
T_3: Quizalofopethyl 5% EC 60 g/ha +Ethoxysulfuron 15 WDG @100g/ha at 15 DAE	319.6	1.60	518.61	25.27	24.52
T_4: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	328.6	1.63	589.16	28.33	27.83
T_5 : Propaquizalofopethyl 10% EC @ 90g/ha at 15 DAE + one HW (30 DAE)	317.0	1.36	486.94	23.88	23.29
T_6: Pendimethalin 35% EC @ 525g/ha (48 hours of sowing with irrigation) + 0ne HW (15 DAE)	300.6	1.21	533.05	24.44	23.41

Treatments	Plant height (cm)	Basal diameter (cm)	Green weight (q/ha)	Fibre yield (q/ha)	
				2020	Pool
T_7: Nail weeder at 5 DAE + Quizalofopethyl 5% EC 60g/ha at 25 DAE	325.0	1.53	595.28	28.89	27.44
T_8: Unweeded check	279.6	1.16	355.28	17.49	17.45
T_9: Two HW at 15-20 DAE and 35-40 DAE	334.3	1.65	563.89	29.44	27.92
SEm±	9.2	0.06	31.23	1.56	0.88
$CD_{(P=0.05)}$	27.5	0.17	93.37	4.66	1.76

HW: hand weeding; MW: mechanical weeding; * pool of 2018, 2019 & 2020

Table 2.16 Weed biomass and weed control efficiency under different weed control methods at Kendrapara, Odisha

Treatments	Weed dry matter (q/ha)			WCE (%)
	15 DAE	35 DAE	45 DAE	
T_1: Pretilichlor 50% EC 900 g/ha at 45-48 hours of sowing with irrigation + one HW (15 DAE)	1.54	1.83	2.07	78.33
T_2 : Quizalofopethyl 10% @ 38 g/ha at 15 DAE + one HW at 30 DAE	3.56	1.55	1.45	73.88
T_3: Quizalofopethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15DAE	3.27	2.34	1.41	72.07
T_4: Quizalofopethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @ 50g/ha at 15DAE + one HW (30 DAE)	2.88	1.76	2.18	72.88
T_5 : Propaquizalofopethyl 10% EC @ 90g/ha at 15 DAE + one HW (30 DAE)	3.49	2.32	4.01	60.92
T_6: Pendimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation) + one HW (15 DAE)	2.58	1.97	4.02	65.87
T_7: Nail weeder at 5 DAE + Quizalofopethyl 5% EC 60 g/ha at 25 DAE	2.44	2.03	1.77	75.14
T_8: Unweeded check	3.73	5.94	15.50	0.00
T_9: Two HW at 15-20 DAE and 35-40 DAE	2.19	2.42	1.46	75.83
SEm±	0.29	0.17	0.24	78.33
$CD_{(P=0.05)}$	0.86	0.50	0.71	

HW: hand weeding; MW: mechanical weeding; WCE: Weed control efficiency

Table 2.17 Economics of different weed control methods at Kendrapara, Odisha

Treatments	Total cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
T_1: Pretilichlor 50% EC 900 g/ha at 45-48 hours of sowing with irrigation + one HW (15 DAE)	57565	118699	61134	2.06
T_2 : Quizalofopethyl 10% EC @ 38g/ha at 15 DAE + one HW at 30 DAE	58485	109935	51450	1.88
T_3: Quizalofopethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @100g/ha at 15DAE	50185	100617	50432	2.00
T_4: Quizalofopethyl 5% EC 60g + Ethoxysulfuron 15 WDG @5 0g/ha at 15DAE+One HW (30 DAE)	58835	114150	55315	1.94
T_5 : Propaquizalofopethyl 10% EC @ 90g/ha at 15 DAE + one HW (30 DAE)	57095	94959	37864	1.66
T_6: Pendimethalin 35% EC @ 525g/ha (48 hours of sowing with irrigation) + One HW (15 DAE)	57485	99840	42355	1.74
T_7: Nail weeder at 5 DAE + Quizalofopethyl 5% EC @ 60 g/ha at 25 DAE	51585	114483	62898	2.22
T_8: Unweeded check	47485	68000	20515	1.43
T_9: Two HW (HW) at 15-20 DAE and 35-40 DAE	68485	116369	47884	1.70

HW: hand weeding; MW: mechanical weeding; MSP of Jute @ Rs. 4225/q

Katihar: Trial failed due to prolonged water logging due to excess rainfall and poor drainage.

IWM in jute seed crop at Rahuri

Rahuri: Significant effect of weed control treatments on yield attributes and seed yield of jute have been observed at Rahuri (table 2.18). Maximum seed yield (16.70 q/ha) of tossa jute was recorded with T_4 treatment (Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @ 50 g/ha at 15 DAE + one hand weeding at 30 DAE) which was at par with T_3 (16.22 q/ha) and T_5 (15.16 q/ha) treatments, respectively. The pool analysis of seed yield of jute for three years (2018-2020) also revealed that maximum seed yield of tossa (16.33 q/ha) was recorded with T_4 treatment. Maximum number of branch/plant (17.7) and pods/plant (110.73) were also recorded with T_4 treatment (table 2.18). The T_4 treatment also recorded minimum weed dry matter (15.84 & 25.45 q/ha) and maximum weed control efficiency (56.8 – 57.9%) at 30 and 45 DAS while at 15 DAS, same trend was recorded with T_1 treatment (table 2.19). Maximum gross return (Rs. 100191/ha) and net return (Rs. 56821/ha) was recorded with T_4 treatment closely followed by T_3 treatment while both the treatments recorded higher B:C ratio (2.31 & 2.33) at Rahuri, Maharashtra (table 2.18). Thus considering the seed yield, weed control efficiency as well as economics, application of quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @ 50 g/ha at 15 DAE + one hand weeding at 30 DAE is recommended for weed control in jute seed crop at Rahuri, Maharashtra.

Table 2.18 Yield attributes and jute seed yield under different weed control methods at Rahuri, Maharashtra

Treatments	Number of branch/ plant	Number of pod/ plant	Seed yield (q/ha)		Cost of cultivation (Rs/ha)	Gross Return (Rs/ha)	Net Return (Rs/ha)	B:C
			2020	Pool*				
T_1 : Pretilachlor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	14.6	94.1	13.95	13.35	42510	83716	41206	1.97
T_2 : Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	13.8	88.8	13.79	13.40	42790	82758	39968	1.93
T_3: Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	15.6	106.7	16.22	15.49	41710	97317	55607	2.33
T_4 : Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	17.7	110.7	16.70	16.33	43370	100191	56821	2.31
T_5 : Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	11.3	83.7	15.16	13.59	42920	90996	48076	2.12
T_6 : Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	10.2	89.0	12.77	12.00	42776	76628	33852	1.79
T_7 : Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g at 25 DAE	14.6	94.2	13.70	13.10	41830	82184	40354	1.96
T_8 : Unweeded check	10.1	59.1	9.93	9.11	39060	59578	20518	1.53
T_9 : Two HW/ MW (nail weeder) at 15-20 DAE and 35-40 DAE	13.4	90.2	13.60	13.91	43460	81609	38149	1.88
SEm±	1.0	5.1	0.65	0.38	-	-	-	-
$CD_{(P=0.05)}$	2.9	15.4	1.94	0.76	-	-	-	-

HW: hand weeding; MW: mechanical weeding; Price of jute seed @ Rs. 60/kg; pool of 2018, 2019 & 2020

Table 2.19 Weed biomass, weed control efficiency and weed index under different weed control methods at Rahuri, Maharashtra

Treatments	Weed dry weight (q/ha)			Weed index (%)	WCE (%)		
	15 DAS	30 DAS	45 DAS		15 DAS	30 DAS	45 DAS
T_1 : Pretilachlor @900 g/ha at 45 -48 hrs of sowing with irrigation + one hand weeding (15 DAE)	7.18	23.37	41.53	17.00	49.47	48.07	46.13
T_2 : Quizalofop ethyl 10% @ 38 g/ha at 15 DAE + one hand weeding (30 DAE)	19.81	22.46	33.96	17.45	18.70	49.06	51.03
T_3: Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron @100g/ha at 15 DAE	17.39	17.54	28.07	2.80	23.61	54.77	55.87
T_4 : Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron@ 50 g/ha at 15 DAE + one hand weeding (30 DAE)	19.29	15.84	25.45	0.00	19.87	56.76	57.93
T_5 : Propaquizafop 10 EC @ 90 g/ha at 15 DAE + one hand weeding (30 DAE)	17.62	25.51	46.44	9.22	23.11	43.64	43.67
T_6 : Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one hand weeding (15 DAE)	10.36	34.09	52.44	24.01	40.84	37.67	40.19
T_7 : Nail weeder at 5 DAE + Quizalofop ethyl 5% EC 60 g at 25 DAE	9.94	27.11	34.79	17.95	38.63	44.22	51.04
T_8 : Unweeded check	30.61	89.31	148.32	40.35	0.00	0.00	0.00
T_9 : Two hand weedings (HW)/MW (nail weeder) at 15-20 DAE and 35-40 DAE	17.09	23.62	33.92	18.43	24.16	45.71	51.65
SEm±	1.20	1.43	1.94	--	--	--	--
$CD_{(P=0.05)}$	3.58	4.27	5.80	--	--	--	--

HW: hand weeding; MW: mechanical weeding; WCE: weed control efficiency

Amadalavalasa: The average fibre yield of mesta in the experimental plot across the teatments were low because of infestation of foot and stem rot disease in mesta. All weed control treatments recorded significantly higher fibre yield of mesta as compared to unweeded control while the treatment effect on plant height and basal diameter was non-significant. The highest fibre yield (13.83 q/ha) was recorded with T_4 treatment (quizalofopethyl 5% EC 60g + ethoxysulfuron @ 50g/ha at 15 DAE + one hand weeding at 30 DAE) which was statistically at par with the fibre yield recorded with T_1, T_2, T_3 and T_9 treatments, respectively. The application of T_4 treatment consistently recorded lower weed dry biomass at 15 (1.27 q/ha), 35 (0.01 q/ha) and 45 DAS (10.65 q/ha) and at harvest (17.96 q/ha) and higher weed control efficiency (74.7%), respectively (table 2.21). Maximum gross (Rs. 58453/ha) and net return (Rs. 10876/ha) was recorded with T_4 treatment closely followed by T_9 (hand weeding mechanical weeding) treatment (Rs. 56025/ha & Rs. 10520/ha) at Amadalavalasa, Andhra Pradesh (table 2.20).

IWM in mesta at Amadalavalasa

Table 2.20 Yield attributes and fibre yield of mesta under different weed control methods atAmadalavalasa, Andhra Pradesh

Treatments	Plant height (cm)	Basal diameter (cm)	Mesta fibre yield (q/ha)	Total cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)
T_1: Pretilachor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	254.6	1.59	11.85	44360	50097	5737
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30DAE)	253.1	1.53	12.04	44303	50886	6584

Treatments	Plant height (cm)	Basal diameter (cm)	Mesta fibre yield (q/ha)	Total cost (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)
T_3: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @ 100 g/ha at 15 DAE	252.3	1.51	12.33	45375	52096	6721
T_4: Quizalofop ethyl 5% EC 60 g/ha + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	277.3	1.68	13.83	47578	58453	10876
T_5: Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	253.0	1.53	10.99	45558	46430	872
T_6: Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	252.3	1.60	9.91	44180	41872	-2308
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC @ 60 g/ha at 25 DAE	247.3	1.47	10.57	42780	44667	1887
T_8: Unweeded control	233.0	1.44	8.01	39005	33836	-5169
T_9: Two HW / MW (nail weeder) at 15-20 DAE and 35-40 DAE	263.6	1.53	13.26	45505	56025	10520
SEm±	11.6	0.05	0.79	--	--	--
$CD_{(P=0.05)}$	NS	NS	2.36	--	--	--

HW: hand weeding; MW: mechanical weeding; MSP of mesta : Rs. 2800/q

Table 2.21 Weed biomass, weed control efficiency and weed index under different weed control methods at Amadalavalasa, Andhra Pradesh

Treatments	Weed dry matter (q/ha)			Weed dry matter at harvest (q/ha)	Weed index at harvest (%)	WCE at harvest (%)
	15 DAS	35 DAS	45 DAS			
T_1: Pretilachor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	1.80	0.85	12.19	21.48	39.16	69.5
T_2: Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30DAE)	2.41	0.01	11.70	17.68	38.10	75.0
T_3: Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	1.77	0.11	12.63	26.22	36.62	62.7
T_4: Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	1.27	0.01	10.65	17.96	29.12	74.7
T_5: Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	2.74	0.01	13.25	24.81	43.44	64.8
T_6: Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	1.24	1.23	11.88	25.22	49.32	64.3
T_7: Nail weeder at 5 DAE + Quizalofop ethyl 5% EC @ 60 g/ha at 25 DAE	4.25	0.01	12.28	44.07	44.88	37.3
T_8: Un weeded control	6.70	15.71	25.66	70.78	58.20	0.0
T_9: Two HW / MW (nail weeder) at 15-20 DAE and 35-40 DAE	5.61	0.16	11.99	31.72	30.80	54.9
SEm±	0.23	0.14	1.05	1.93	4.03	--
$CD_{(P=0.05)}$	0.68	0.41	3.13	5.77	12.04	--

HW: hand weeding; MW: mechanical weeding; WCE- Weed Control efficiency

Aduthurai: The experimental data revealed that significantly higher basal diameter (2.56 cm) and fibre yield (27.32 q/ha) of mesta were recorded with T_1 (pretilachlor 900 g/ha at 45-48 hrs of sowing with irrigation + one hand weeding at 15 DAE) treatment over other treatments (table 2.22). Maximum plant height (224.6 q/ha) was recorded with T_2 treatment. The T_1 treatment also recorded minimum weed dry matter (0.28 - 0.76 q/ha) and maximum weed control efficiency (50.09 – 76.34%) at all the sampling dates (table 2.23). Maximum gross return (Rs. 109280/ha), net return (Rs. 77830/ha) and B:C ratio (3.47) were recorded with T_1 treatment closely followed by T_2 and T_3 treatments (table 2.22).

Table 2.22 Yield attributes and fibre yield of mesta under different weed control methods atAduthurai, Tamil Nadu

Treatments	Plant height (cm)	Basal diameter (cm)	Fibre yield (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
T_1 : Pretilachlor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	221.2	2.56	27.32	31450	109280	77830	3.47
T_2 : Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	224.6	2.27	24.22	33200	96893	63693	2.92
T_3 : Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	219.5	2.25	22.44	29600	89787	60187	3.03
T_4 : Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	217.9	2.22	21.01	32400	84067	51667	2.59
T_5 : Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	215.5	2.22	21.61	31600	86440	54840	2.74
T_6 : Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	214.5	2.23	21.38	30950	85533	54583	2.76
T_7 : Nail weeder at 5 DAE + Quizalofop ethyl 5% EC @ 60 g/ha at 25 DAE	211.4	2.12	22.01	33500	88067	54567	2.63
T_8 : Unweeded check	199.4	2.12	20.16	30900	80667	49767	2.61
T_9 : Two HW/MW (nail weeder) at 15-20 DAE and 35-40 DAE	219.1	2.30	24.40	31700	97600	65900	3.08
SEm±	3.6	0.03	0.56	--	--	--	--
$CD_{(P=0.05)}$	10.7	0.08	1.67	--	--	--	--

HW: hand weeding; MW: mechanical weeding; *MSP of mesta : Rs. 2800/q*

Table 2.23 Weed biomass, weed control efficiency and weed index under different weed control methods at Aduthurai, Tamil Nadu

Treatments	Weed dry Biomass (q/ha)			Weed index (%)	WCE (%)		
	15 DAS	35 DAS	45 DAS		15 DAS	35 DAS	45 DAS
T_1 : Pretilachlor 50% EC @ 900 g/ha at 45 -48 hrs of sowing with irrigation + one HW (15 DAE)	0.28	0.76	0.46	0.00	76.34	50.09	73.71
T_2 : Quizalofop ethyl 10% EC @ 38 g/ha at 15 DAE + one HW (30 DAE)	0.84	1.12	0.83	11.34	28.68	27.70	53.34
T_3 : Quizalofop ethyl 5% EC @ 60 g/ha + Ethoxysulfuron 15 WDG @100 g/ha at 15 DAE	0.68	1.11	0.93	17.80	41.76	27.64	48.13
T_4 : Quizalofop ethyl 5% EC 60 g + Ethoxysulfuron 15 WDG @ 50 g/ha at 15 DAE + one HW (30 DAE)	0.70	1.06	0.72	23.07	40.22	30.13	60.15
T_5 : Propaquizafop 10% EC @ 90 g/ha at 15 DAE + one HW (30 DAE)	0.72	1.01	0.73	20.90	38.71	32.37	58.05
T_6 : Pedimethalin 35% EC @ 525 g/ha (48 hours of sowing with irrigation or sufficient rain) + one HW (15 DAE)	0.40	1.20	0.89	21.70	65.45	22.68	49.04
T_7 : Nail weeder at 5 DAE + Quizalofop ethyl 5% EC @ 60 g/ha at 25 DAE	0.68	1.20	0.72	19.38	42.34	23.88	59.49
T_8 : Unweeded check	1.18	1.57	1.82	29.52	0.00	0.00	0.00
T_9 : Two HW/MW (nail weeder) at 15-20 DAE and 35-40 DAE	0.52	0.78	0.58	13.11	55.86	45.02	66.00
SEm±	0.06	0.13	0.08	--	--	--	--
$CD_{(P=0.05)}$	0.17	0.38	0.23	--	--	--	--

HW: hand weeding; MW: mechanical weeding; WCE- Weed Control efficiency

NP (JA) 7.13: Demonstration trial for use of jute fabrics / gunny bags in crop production

The trial was initiated in 2015 with an objective to increase the use of jute bags in agriculture sector and increase revenue from unit land area in unit time. The result of the centre is presented below.

Coochbehar: The demonstration trial data of growing vegetable crops on soil columns within jute gunny bags in the transplanted paddy field in 4:1 and 8:1 row ratio (rice : vegetable) showed an increased productivity as well as profitability of the system without affecting the rice yield. Intercropping of brinjal at both row ratio recorded higher rice equivalent yield (131.91 & 134.43 q/ha), gross return (Rs. 145105 & 147870/ha), net return (Rs. 87955 & 91920/ha) and B:C ratio (2.54 & 2.64) followed by rice + tomato system compared to sole rice (37.43 q/ha, Rs. 41173/ha, 17423/ha & 1.73, respectively) (table 2.24)

Table 2.24 Crop yield and economics of growing vegetables in jute gunny bags in transplanted paddy field at Coochbehar, West Bengal

Treatments	Yield of rice (q/ha)	Yield of component crop (q/ha)	Rice equivalent yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs./ha)	Net return (Rs/ha)	B:C
T1: Transplanted rice	37.43	--	37.43	23750	41173	17423	0.73
T2: Rice + brinjal (8:1)	33.95	26.94	131.91	57150	145105	87955	2.54
T3: Rice + tomato (8:1)	32.27	14.82	75.25	48150	82777	34627	1.72
T4: Rice + chilli (8:1)	29.52	5.05	47.88	53200	52672	-528	0.99
T5: Rice + brinjal (4:1)	32.10	28.14	134.43	55950	147870	91920	2.64
T6: Rice + tomato (4:1)	32.02	13.41	80.78	47380	88862	41482	1.88
T7: Rice + chilli (4:1)	22.83	9.58	57.67	54890	63433	8543	1.16

***Selling price on the basis of local market: Rice: Rs. 11.00/kg, Brinjal: Rs. 40.00/kg, Tomato: Rs. 40.00/kg and Chilli: Rs. 100.00/kg at Coochbehar, West bengal*

Kendrapara: The results of the demonstration showed that growing ridge gourd on soil columns within jute gunny bags in the transplanted paddy field increased the productivity as well as profitability of the system. The yield of ridge gourd in jute gunny bag system was 17.36 q/ha (paddy equivalent yield – 43.40 q/ha). Thus growing of ridge gourd in jute gunny bags in inter-row space of transplanted paddy field recorded higher system paddy equivalent yield (68.40 q/ha), gross return (Rs. 123120/ha), net return (Rs. 74120/ha) compared to sole paddy (40.00 q/ha, Rs. 72000/ha & 32000/ha, respectively) (table 2.25)

Table 2.25 Crop yield and economics of growing vegetables in jute gunny bags in transplanted paddy field at Kendrapara, Odisha

Treatments	Paddy yield (q/ha)	Yield of component crop (q/ha)	Paddy equivalent yield (q/ha)	System Paddy equivalent yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)
T_1(Sole paddy crop)	40.00	-	40.00	40.00	40000	72000	32000
T_2(Paddy + ridge gourd)	25.00	17.36	43.40	68.40	49000	123120	74120

***: Price of paddy - Rs.18/kg and price of ridge gourd - Rs.45/kg*

NP (JA) 7.14: Response of integrated nutrient management for seed production in tossa jute (C. olitorius)/mesta

The trial was initiated in 2017 and later modified in 2018 for conducting it at Amadalavalasa centre to find out the optimum dose of seed yield of mesta. The result of the centre is presented below.

Amadalavalasa: The experimental data revealed that application of FYM @ 5 t/ha + liming @ 25% LR recorded significantly higher number of branches/plant (19.0), pods/plant (57.0), seeds/pod (25.0) and seed yield (11.27 q/ha) of mesta over both FYM (5 t/ha) and no FYM treatments in 2019-20. Same trend in seed yield was observed when data was pooled (table 2.26). The comparison of fertilizer treatments revealed that F_4 (NPK @ 80: 17.5: 33.3 kg/ha) and F5 (NPK @ 80: 26: 50 kg/ha) treatments were statistically at par but both the treatments recorded significantly higher

seed yield and yield attributing characters (except number of pods/plant) of mesta over other fertilizer treatments in 2019-20. Similar trend was observed in case of seed yield of mesta (8.13 to 8.68 q/ha) when the data was pooled (table 2.26). The interaction of organic matter with fertilizer doses was significant and the data revealed that F_4M_3 (NPK @ 80: 17.5: 33.3 kg/ha + FYM @ 5 t/ha + lime @ 25% LR) and $F_5 M_3$ (NPK @ 80: 26: 50 kg/ha + FYM @ 5 t/ha + lime @ 25% LR) treatments were at par and recorded significantly higher seed yield (17.14 - 17.58 q/ha) of mesta in 2020-21 and also when the data was pooled (2018-2020) (12.16 - 12.93 q/ha) at Amadalavalasa, Andhra Pradesh (table 2.27).

Application of organic matter along with lime recorded highest net return (Rs. 78342/ha) and B:C ratio (3.28) of mesta compared to sole FYM and control treatments. Among the fertilizer treatments, the fertilizer dose of 80: 17.5: 33.3 kg NPK/ha recorded maximum net return (Rs. 82967/ha) and B:C ratio (3.71) (table 2.26). Hence application of FYM @ 5t/ha + lime (@25%LR along with NPK @ 80: 17.5: 33.3 kg/ha is recommended for seed production in mesta at Amadalavalasa, Andhra Pradesh.

Table 2.26 Effect of organic manure and fertilizers on yield attributes, seed yield and economics of cultivation of mesta at Amadalavalasa, Andhra Pradesh

Treatments	Number of branches /plant	Number of pods / plant	Number of seeds / pod	Seed yield (q/ha)		Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
				2020-21	Pool*				
Organic manure									
M_1 : No FYM	9.0	29.0	17.0	3.28	2.87	25533	32803	7270	1.28
M_2: FYM @ 5t/ha	16.0	47.0	24.0	7.81	5.70	30533	78117	47583	2.56
M_3: FYM @ 5t/ha+ lime (@25%LR)	19.0	57.0	25.0	11.27	8.19	34414	112757	78342	3.28
SEm±	0.45	0.80	0.34	0.24	0.09	--	--	--	--
$CD_{(P=0.05)}$	1.76	3.13	1.33	0.94	0.25	--	--	--	--
Fertilizer dose									
F_1 : Control	4.0	16.0	18.0	2.56	1.98	26029	25650	-379	0.99
F_2 : 60: 13: 25	10.0	35.0	21.0	4.80	3.73	29473	47983	18510	1.63
F_3 : 60: 26: 50	17.0	44.0	22.0	7.25	5.41	32223	72539	40316	2.25
F_4 : 80: 17.5: 33.3	22.0	59.0	25.0	11.36	8.13	30622	113589	82967	3.71
F_5 : 80: 26: 50	21.0	66.0	23.0	11.30	8.68	32455	113033	80578	3.48
SEm±	0.66	1.15	0.72	0.29	0.12	--	--	--	--
$CD_{(P=0.05)}$	1.92	3.34	2.09	0.84	0.33	--	--	--	--

**: pool of 2018-19, 2019-20 & 2020-21; MSP of mesta = Rs. 2800/q*

Table 2.27 Interactive effect of organic manure and fertilizers on seed yield of mesta at Amadalavalasa, Andhra Pradesh

Fertilizer dose (kg/ha)	Seed yield (q/ha)					
	Organic matter / Lime					
	2020-21			Pool (2018-19, 2019-20 & 2020-21)		
	M_1	M_2	M_3	M_1	M_2	M_3
F_1 : Control	0.64	2.86	4.19	0.74	2.15	3.05
F_2 : 60: 13: 25	2.21	5.10	7.08	1.98	3.92	5.30
F_3 : 60: 26: 50	2.68	8.69	10.39	2.58	6.12	7.53
F_4 : 80: 17.5: 33.3	5.67	10.82	17.58	4.54	7.69	12.16
F_5 : 80: 26: 50	5.19	11.58	17.14	4.52	8.61	12.93
SEm±	0.51			0.28		
$CD_{(P=0.05)}$	1.48			0.82		

M_1 : No FYM; M_2 : FYM @ 5 t/ha; M_3 : FYM @ 5 t/ha + lime @ 25% LR

NP(JA) 7.15: Carbon dynamics and hydro-physical characterization of soil in jute and mesta growing areas

The study was initiated in 2015 in all the AINP JAF centres and was later modified in 2017 with two major objectives – i) to generate database on soil hydro-physical behaviour under various jute and mesta growing areas in India and ii) to quantify different carbon pools and their interactions under various jute and mesta growing areas in India. The results for 2020 as per objectives are presented below:

A) Soil Hydro-physical Characterization

During the period reported upon, soil samples collected from AINP centres namely Nagaon (03 locations), Amadalavalasa (10 locations), Rahuri (06 locations) and Aduthurai (07 locations), and Kendrapara (03 locations). The centre-wise reports are as follows:

Nagaon, Assam

The soils are acidic (range: 5.60 to 5.77) in nature and clay loam in texture. The bulk density (BD) of the soils ranging in between 1.36 and 1.41 Mg/m^3. The clay content of the soils varies in between 30.1 to 33.0 %. The SOC contents among the various locations are categorised in medium and it ranged in between 0.87- 0.99%, highest being at Kathiatoli (table 2.28). The water stable aggregate (WSA) and mean weight diameter (MWD) showed that of both the locations has significantly higher aggregate stability (WSA range: 76.03-78.92%; MWD range: 0.83-0.85 mm). Saturated hydraulic conductivity (Ks) values revealed that there were wide variations between both the locations and it varied between 0.56 and 0.85 cm/hr (X 10^{-3}). Medium to faster rate of steady infiltration was recorded in both the locations (ranging in between 7.68-11.00 cm/hr. Available water contents in both the locations were almost same (range: 0.25-0.26 m^3/m^3) (table 2.28).

Table 2.28 Hydro-physical soil properties at various locations of Hojai district, Assam

Sl. No.	Name of the Village/ Location	BD (Mg/ m^3)	Soil Texture			Textural Class	Org. C (%)	pH	CEC (cmol/ kg)	WSA (> 0.25 mm)	Mean Weight Diam. (mm)	K_s cm/hr (x 10^{-3})	Infiltration rate (cm/hr)	Avail. Water (m^3/m^3)
			Sand (%)	Silt (%)	Clay (%)									
1.	Hojai	1.36	26.4	41.6	30.1	Clay loam	0.87	5.77	9.07	76.03	0.83	0.56	7.68	0.25
2.	Kathiatoli	1.41	29.3	36.7	33.0	Clay loam	0.99	5.60	9.13	78.92	0.85	0.85	11.0	0.26
	Std. Dev.	0.04	2.93	3.62	3.44	-	0.12	0.17	0.57	2.68	0.02	0.32	2.54	0.01

Amadalavalasa, Andhra Pradesh

The pH of the soils are mostly acidic (pH range: 5.39-5.84) in reaction and mostly sandy loam to sandy clay loam in texture (table 2.29). The sand content of the soils are very high (range: 72.53- 84.80 %). There are significant variations in BD values of these locations (range: 1.32-1.41 Mg/m^3). The SOC contents among the various locations are categorised in low to medium and it ranged in between 0.38-0.58%, highest and lowest being at Balijipeta and Goluguvalasa, respectively (table 2.29).

Table 2.29 Hydro-physical soil properties at various mesta growing areas of Andhra Pradesh

Sl. No.	Name of the Village/ Location	BD (Mg/m^3)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
1.	Goluguvalasa	1.41	80.85	6.43	12.72	Sandy loam	0.42	5.42	0.08
2.	Vantharam	1.38	79.35	5.37	15.28	Sandy loam	0.48	5.48	0.08
3.	Pankuvalasa	1.34	73.01	6.52	20.47	Sandy clay loam	0.51	5.74	0.07

Sl. No.	Name of the Village/ Location	BD (Mg/m³)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
4.	Kosangipadu	1.37	77.18	7.06	15.76	Sandy loam	0.46	5.54	0.06
5.	Chilakapalle	1.38	80.18	6.18	13.64	Sandy loam	0.43	5.39	0.06
6.	Balijipeta	1.37	84.8	5.84	9.36	loamy sand	0.58	5.67	0.08
7.	Amiti	1.36	83.67	6.49	9.84	loamy sand	0.38	5.81	0.06
8.	Lingalavalasa	1.32	72.53	6.13	21.34	Sandy clay loam	0.48	5.46	0.07
9.	Boddapadu	1.38	74.65	5.67	19.68	Sand loamy	0.52	5.84	0.06
10.	Jalumuru	1.34	73.07	6.68	20.25	Sandy clay loam	0.49	5.82	0.08
	Std. Dev.	0.03	4.52	0.51	4.46	-	0.06	0.18	0.01

Kendrapara, Odisha

The pH of the soils are mostly acidic (pH range: 5.89 - 6.75) in reaction and mostly clay loam in texture. The sand content of the soils are very high (range: 38 - 48 %) while the clay content of the soil at Badamula basanta, Pattamundai block, Odisha is high (46.14 %). There is significant difference in EC values among the various locations and it ranged in between 0.13 - 0.21 dS/m (table 2.30). The BD values of these locations varied in between 1.37 - 1.43 Mg/m³. The SOC contents among the various locations are categorised in low to medium and it ranged in between 0.54 - 0.73%. Among the various locations in Chaudakutala, Kendra para block is having highest SOC content (0.73 %) (table 2.30).

Table 2.30 Hydro-physical soil properties at various locations of Pattamundai and Kendrapara blocks, Odisha

Sl. No.	Name of the Village/Location	BD (Mg/m³)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
1.	Badamula basanta, Pattamundai Block	1.41	38.00	15.86	46.14	Clay	0.54	6.75	0.21
2.	Chaudakutala Kendrapara Block	1.37	48.00	23.86	28.14	Sandy clay loam	0.73	5.89	0.13
3.	Samalpur Kendrapara Block	1.43	40.00	23.86	36.14	Clay loam	0.60	6.06	0.17
	Std. Dev.	0.03	4.73	4.13	8.07	-	0.11	0.40	0.04

Aduthurai, Tamil Nadu

The soils of all mesta growing areas of Nagapattinam districts, Tamil Nadu are acidic to neutral in nature (range 6.10- 7.25). The soils are sandy loam to clay loam in texture, as clay% varies in between 28.5 to 48.5% (table 2.31). The sand percentages in the soils varies from 22.73 to 49.20 %. The BD values of these locations varied in between 1.80-2.16 Mg/m³. The SOC content of the soils of Nagapattinam districts, Tamil Nadu are categorised under low to medium (range: 0.51- 0.86 %), lowest being in Sirkazhi and highest being in Nakkambadi (table 2.31).

Table 2.31 Hydro-physical soil properties at various mesta growing areas of Nagapattinam districts, Tamil Nadu

Sl. No.	Name of the Village/ Location	BD (Mg/ m³)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
1.	Pandur	1.77	42.17	22.00	35.83	sandy loam	0.78	6.45	0.04
2.	Sirkazhi	1.99	29.80	31.20	39.00	Clay loam	0.51	6.10	0.04
3.	Nakkambadi	1.82	45.90	20.45	33.65	sandy loam	0.68	7.25	0.03
4.	Manganallur	1.80	50.50	21.00	28.50	sandy loam	0.76	6.35	0.04

Sl. No.	Name of the Village/ Location	BD (Mg/ m³)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
5.	Kali,Mayiladuthurai	1.82	49.20	20.40	30.40	sandy loam	0.62	6.80	0.06
6.	Thiruvalaputhur	1.88	45.00	23.00	32.00	sandy loam	0.74	7.00	0.04
7.	Radhanallur	1.77	49.10	22.40	28.50	sandy loam	0.86	6.45	0.03
8.	Arupathi	2.06	22.73	31.07	46.20	Clay loam	0.55	6.75	0.06
9.	Memathur	1.88	46.60	23.00	30.40	sandy loam	0.74	7.10	0.08
10.	Nimmezhi,sirkazhi	2.16	24.75	26.75	48.50	Clay loam	0.51	7.10	0.06
	Std. Dev.	0.13	10.63	4.11	7.16	-	0.12	0.38	0.02

Rahuri, Maharastra

The soils of the Experimental fields of MPKV, Rahuri are mostly alkaline (pH range: 8.04-8.87) in reaction and clay in texture except in Jute seed production and roselle plots where they are loamy sand and loamy in texture, respectively. The soil samples collected from Jute seed production plot is having high sand content (86.00 %) and having very low clay content (2.54 %). The BD values of these locations varied in between 1.14 -1.27 Mg/m³ (table 2.32). The bulk SOC contents are ranging in between 0.47 to 0.72 % and the SOC content can be categorised under low to medium. Among all the locations studied, the soils of Sunnhemp, Agronomy plot had comparatively high SOC content (0.72 %) lowest being at Jute Agronomy plot (0.47 %). Overall, the soil physicochemical properties of research farms of MPKV, Rahuri are heterogenous in nature (table 2.32).

Table 2.32 Hydro-physical soil properties at various locations of experimental plots of MPKV, Rahuri

Sl. No.	Name of the Village/ Location	BD (Mg/ m³)	Soil Texture			Textural Class	Org. C (%)	pH	EC (dS/m)
			Sand (%)	Silt (%)	Clay (%)				
1.	Jute seed production plot	1.23	86.00	11.46	2.54	Loamy sand	0.56	8.04	0.03
2.	Roselle plot	1.26	44.00	29.46	26.54	Loam	0.63	8.87	0.03
3.	Jute agronomy	1.27	29.60	23.86	46.34	Clay	0.47	8.84	0.04
4.	Kenaf plot	1.19	31.60	23.86	44.54	Clay	0.62	8.83	0.04
5.	Jute breeding	1.14	33.60	25.86	40.54	Clay	0.54	8.77	0.03
6.	Sunnhemp Agronomy	1.18	33.60	23.86	42.54	Clay	0.72	8.61	0.04
	Std. Dev.	0.02	21.62	6.09	16.91	-	0.08	0.33	0.01

B) Soil Carbon Dynamics

During the period reported upon, soil carbon pools at various locations of experimental plots of MPKV, Rahuri were quantified and presented in table. Results showed that (following the modified Chan *et al.*, 2001 method) very labile portion were more than that of labile and non-labile pools (table 2.33).

Table 2.33 Soil carbon pools at various locations of experimental plots of MPKV, Rahuri

Location	Very Labile Pool (g/kg)	Labile Pool (g/kg)	Non Labile Pool (g/kg)
Site 1: Jute seed production plot	3.44	2.20	1.86
Site 2: Roselle plot	4.23	2.12	2.10
Site 3: Jute agronomy	3.30	1.63	1.63
Site 4: Kenaf plot	4.23	2.05	2.03
Site 5: Jute breeding	3.73	1.98	1.89
Site 6: Sunnhemp Agronomy	4.74	2.41	2.36

NP(JA) 7.16: Improved jute seed production and weed control methods for high rainfall region

The trial was initiated in 2018 at Nagaon and Coochbehar centres with an objective to ascertain self sufficiency in jute seed production in eastern India and also to establish effective weed management procedure for jute seed crop in *kharif* season. The results obtained are summarized below.

Nagaon: The trial failed due to excess rainfall and water logging due to poor drainage during the experimental period as reported.

Coochbehar: The experimental data revealed that method of sowing had significant influence only on number of productive branches/plant of jute while weed control methods significantly influenced seed yield and yield attributing characters of jute except number of productive branches/plant, at Coochbehar, West Bengal. Flat bed sowing recorded significantly higher number of productive branches/plant (5.1) over other sowing methods. All the weed control treatments recorded significantly higher value of seed yield and yield attributing characters of jute over unweeded control. Maximum value of seed yield (2.35 q/ha), pods/plant (37.2), seeds/pod (199.0) and 1000 seed weight (2.18 g) was recorded with W_1 (two hand weeding treatment) and the treatment was at par W_4 (pretilachlor 0.9 kg/ha as pre-emergence+ one hand weeding) and W_5 (Quizalofop ethyl 10% EC 38 g + ethoxysulfuron @135 g/ha at 15 DAE) treatments (also with W_3 treatment with respect to pods/plant of jute) (table 2.34). Weed dry matter was found significantly lower with W_1 and W_5 treatments (0.31- 0.33 q/ha) at 30 DAE and with W_1treatment (0.33 q/ha) at 45 DAE, respectively (table 2.34). The interaction of types of sowing with weed control methods on seed yield of jute was found non-significant. The pool analysis of three years data (2018 to 2020) revealed that significantly higher seed yield of tossa jute was recorded with flat bed sowing (3.21 q/ha) and with two hand weeding (3.23 q/ha) at Coochbehar, West Bengal and is recommended for jute seed cultivation in the region (table 2.34).

Table 2.34 Effect of sowing and weeding methods on yield attributes and seed yield of tossa jute at Coochbehar, West Bengal

Treatments	Productive branch/ plant	Number of pods/ plant	Seeds / pod	1000 seed weight (gm)	Seed yield (q/ha)		Weed dry matter (q/ha)	
					2020	Pool*	30 DAE	45 DAE
Method of sowing								
S_1: Flat bed sowing	5.1	36.4	189.9	2.16	2.11	3.21	1.04	1.17
S_2: Flat bed transplanting	3.7	30.0	139.2	2.12	1.69	2.25	0.73	0.85
S_3: Transplanting of jute seedlings on ridges	2.5	28.6	164.8	2.12	1.74	2.79	0.73	0.92
SEm±	0.2	2.9	15.8	0.02	0.24	0.12	0.06	0.03
$CD_{(P=0.05)}$	0.7	NS	NS	NS	NS	0.23	0.23	0.11
Method of weeding								
W_1: Two hand weeding	4.39	37.2	199.0	2.18	2.35	3.23	0.31	0.33
W_2: Unweeded check	2.23	19.1	107.2	1.99	1.13	2.15	2.34	2.82
W_3: Pendimethalin 35% EC @ 0.5 kg /ha + one hand weeding	3.90	32.4	165.1	2.15	1.73	2.61	0.60	0.69
W_4: Pretilachlor 50% EC @ 0.9 kg/ha + one hand weeding	4.26	34.7	174.8	2.18	1.88	2.90	0.59	0.68
W_5: Quizalofop ethyl 10 EC 38 g + Ethoxysulfuron 15 WDG @135 g/ha at 15 DAE	4.21	34.9	177.0	2.17	2.14	2.88	0.33	0.38
SEm±	0.65	2.3	9.8	0.02	0.18	0.16	0.08	0.06
$CD_{(P=0.05)}$	NS	6.8	28.6	0.05	0.52	0.31	0.23	0.17

*: pool of 2018, 2019 & 2020

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

The trial was initiated in 2020 at Rahuri centre with an objective to study the effect of urban compost on seed yield of tossa jute. The results obtained are summarized below.

Rahuri: The experimental data revealed that maximum seed yield of *tossa* jute (17.09 q/ha) was recorded with T_8 (75% RDN + 25% N through FYM + 5 kg $MgSO_4$) treatment which was statistically at par with seed yield with T_7 (16.63 q/ha), T_2 (15.74 q/ha) and T_3 (15.56 q/ha) treatments, respectively. Similar trend was recorded in case of number of pods/plant of jute while for 1000 seed weight, the T_8, T_7, T_3 and T_4 treatments were at par in their effect. Number of branches/plant of tossa jute was again highest with T_8 treatment (12.8) which was at par with T_7 treatment (table 2.35). Maximum gross return (Rs. 102580/ha), net return (Rs. 57270/ha) was recorded with T_8 treatment followed by T_7 treatment while B:C ratio was highest with T_7 treatment (2.28) closely followed by T_8 treatment (2.26) at Rahuri, Maharashtra (table 2.36).

INM in jute seed crop at Rahuri

Table 2.35 Effect of nutrient management methods on yield attributes and seed yield of tossa jute at Rahuri, Maharashtra

Treatments	Productive branch/plant	Number of pod/plant	Seed / pod	1000 seed weight (gm)	Seed yield (q/ha)
T_1: RDN* (80 kg N/ha)	8.8	53.1	207.3	2.58	12.39
T_2: RDN + FYM 5 t/ha	10.4	85.8	225.6	2.61	15.74
T_3: 75 % RDN + 25 % N through Urban compost	10.8	83.2	228.0	2.81	15.56
T_4: 75 % RDN + 25 % N through FYM	10.6	82.8	213.0	2.90	13.49
T_5: RDN + 5 kg $MgSO_4$ /ha	10.0	66.3	218.0	2.57	14.45
T_6: RDN + + 10 kg $MgSO_4$ /ha	10.4	65.7	219.3	2.54	12.61
T_7:75 % RDN + 25 % N through Urban compost + 5 kg $MgSO_4$ /ha	13.3	95.8	232.0	2.91	16.63
T_8: 75 % RDN + 25 % N through FYM + 5 kg $MgSO_4$ /ha	12.7	104.1	237.6	2.93	17.09
SEm±	0.7	6.9	6.9	0.07	0.77
$CD_{(P=0.05)}$	2.1	20.9	NS	0.21	2.33

**: RDN – recommended dose of nitrogen*

Table 2.36 Economics of nutrient management methods on yield attributes and seed yield of jute at Rahuri, Maharastra

Treatments	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
T_1: RDN* (80 kg N/ha)	41710	74360	32650	1.78
T_2: RDN + FYM 5 t/ha	46790	94440	47650	2.02

Treatments	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C ratio
T_3: 75 % RDN + 25 % N through Urban compost	43370	93380	50010	2.15
T_4: 75 % RDN + 25 % N through FYM	44870	80960	36090	1.8
T_5: RDN + 5 kg $MgSO_4$ /ha	42776	86740	43964	2.03
T_6: RDN + + 10 kg $MgSO_4$ /ha	42920	75660	32740	1.76
T_7:75 % RDN + 25 % N through Urban compost + 5 kg $MgSO_4$ /ha	43810	99780	55970	2.28
T_8: 75 % RDN + 25 % N through FYM + 5 kg $MgSO_4$ /ha	45310	102580	57270	2.26

Mesta

NP (MA) 3.5: Comparative evaluation of mesta based cropping systems for higher productivity and profitability

The trials were conducted at Amadalavalasa and Aduthurai centres in 2020 with an objective to find out suitable mesta based cropping sequences and intercropping systems for higher productivity and profitability. The results obtained are summarized below.

a) Mesta based intercropping systems

Amadalavalasa: The perusal of data of intercropping trial in 2020 revealed that highest mesta equivalent yield (48.34 q/ha) was recorded with sole maize closely followed by mesta + maize (2:1) intercropping system (47.36 q/ha). Mesta + sunnhemp (3:4) also recorded higher mesta equivalent yield (32.82 q/ha) among other intercropping systems. All intercropping systems recorded higher mesta equivalent yield compared to that of sole mesta crop (22.93 q/ha) (table 2.37). Among the intercropping systems tested, maximum gross return (Rs. 132740/ha) and net return (Rs. 80624/ha) was recorded with mesta + maize (2:1) intercropping followed by mesta + sunnhemp (3:4) (Rs. 91976/ha & Rs. 70310/ha) which were considerably higher than that with sole mesta. Among the other intercropping systems, mesta + greengram, mesta + blackgram and mesta + groundnut also recorded higher gross and net return over sole mesta. Among the intercropping systems, again highest B:C ratio was recorded with mesta + sunnhemp (4.25) followed by mesta + blackgram (3.59) and mesta + greengram (3.56), respectively (table 2.37).

Intercropping in mesta at Amadalavalasa ??

Table 2.37 Crop yield and economics of cultivation under different mesta based intercropping systems at Amadalavalasa, Andhra Pradesh

Treatments	Mesta fibre yield (q/ha)	Component crop yield (q/ha)		Mesta fibre equivalent yield (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C
		Sole crop	Intercrop					
T_1: Sole mesta 30 cm×10 cm)	22.93	22.93	0.00	22.93	21816	64204	42388	2.94
T_2: Sole ground nut (30 cm × 10 cm)	--	19.10	0.00	35.91	55676	100753	45077	1.81
T_3: Sole maize (30 cm×20 cm)	--	73.25	0.00	48.34	50753	135513	84760	2.67
T_4: Sole cluster bean (60 cm×25 cm)	--	44.60	0.00	35.23	26513	98120	71607	3.70
T_5: Sole greengram (30 cm×10 cm)	--	13.15	0.00	33.79	22089	94627	72538	4.28
T_6: Sole sunnhemp (30 cm×10 cm)	--	17.40	0.00	37.23	21584	104400	82816	4.84
T_7: Sole blackgram (30 cm×10 cm)	--	6.85	0.00	14.66	22089	41100	19011	1.86
T_8: Mesta + groundnut (3:4)	10.38	0.00	9.10	27.49	43826	77067	33241	1.76
T_9: Mesta + maize (2:1)	14.88	0.00	49.23	47.36	52116	132740	80624	2.55
T_{10}: Mesta + Cluster bean (3:4)	13.95	0.00	12.90	24.13	24869	67440	42571	2.71
T_{11}: Mesta + green gram (3:4)	13.86	0.00	5.50	27.99	21994	78386	56392	3.56
T_{12}: Mesta + sunnhemp (3:4)	12.92	0.00	9.30	32.82	21666	91976	70310	4.25
T_{13}: Mesta + blackgram (3:4)	17.69	0.00	4.90	28.17	21994	78932	56938	3.59
SEm±	--	--	--	2.34	--	--	--	--
$CD_{(P=0.05)}$	--	--	--	6.80	--	--	--	--

**: under intercropping; price????*

Aduthurai: The results of trials on intercropping of mesta in 2020 revealed that mesta + rice (3:4) system recorded significantly higher mesta equivalent yield (45.96 q/ha) over other intercropping systems as well as sole crop of mesta and was followed by mesta + groundnut (3:4) intercropping system (41.02 q/ha) in this regard (table 2.38). Maximum value of gross return (Rs. 128412/ha) and net return (Rs. 98212/ha) was recorded with mesta + rice (3:4) intercropping followed by mesta + groundnut (3:4) (Rs. 114966/ha & Rs. 81966/ha) which were considerably higher than that with sole mesta (table 2.38).

Mesta based crop sequence at Aduthurai

b) Mesta based cropping sequence

Amadalavalasa (2020-21): The succeeding crop of mesta are to be harvested and the result of the trial will be presented in 2021 Annual report.

Aduthurai (2019-20): The data of mesta based cropping sequence trial of 2019-20 revealed that mesta-sunnhemp crop sequence recorded maximum mesta fibre equivalent yield (68.50 q/ha) followed by maesta – maize (58.64 q/ha) and mesta – groundnut (51.77 q/ha) crop sequences at Aduthurai, Tamil Nadu (table 2.39). Mesta – sunnhemp crop sequence also recorded highest gross return (Rs. 191973/ha), net return (Rs. 152153/ha) followed by mesta – maize and mesta – groundnut sequences also whereas highest B:C ratio was recorded with mesta – sunnhemp sequence (4.82) followed by mesta – greengram (2.67) and mesta – blackgram (2.66), respectively (table 2.39).

Table 2.38 Yield attributes and fibre yield of mesta under different mesta based intercropping system at Aduthurai, Tamil Nadu

Treatments	Mesta fibre yield (q/ha)	Component crop yield (q/ha)		Mesta fibre equivalent yield (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C
		Sole crop	Intercrop					
T_1: Sole mesta (30 cm×10 cm)	27.47	27.47	--	27.46	32000	76907	44907	2.40
T_2: Sole rice (20 cm×10 cm)	--	60.05	--	40.23	34200	112173	77973	3.28
T_3: Sole ground nut (30 cm×10 cm)	--	17.87	--	33.59	28400	94247	65847	3.32
T_4: Sole greengram (30 cm ×10 cm)	--	10.98	--	28.22	32000	79036	47036	2.47
T_5: Sole blackgram (30 cm ×10 cm)	--	9.10	--	19.47	31900	54600	22700	1.71
T_6: Mesta + rice (3:4)	22.00	--	35.76	45.96	30200	128412	98212	4.25
T_7: Mesta + ground nut (3:4)	23.57	--	9.28	41.02	33000	114966	81966	3.48
T_8: Mesta + greengram (3:4)	23.33	--	5.58	37.68	27800	105511	77711	3.80
T_9: Mesta + blackgram (3:4)	23.63	--	4.80	33.90	32800	94973	62173	2.90
SEm±	--	--	--	1.28	--	--	--	--
$CD_{(P=0.05)}$	--	--	--	3.82	--	--	--	--

Table 2.39 Yield attributes and fibre yield of mesta under different mesta based intercropping system at Aduthurai, TamilNadu

Treatments	Mesta fibre yield (q/ha)	Sequence (2^{nd}) crop yield (q/ha)	System mesta fibre equivalent (MEY) yield (q/ha)	Cost of cultivation (Rs/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	B:C
T_1: Mesta - groundnut	24.63	14.43	51.77 (27.13) *	73575	145109	71534	1.97
T_2: Mesta - maize	24.86	51.17	58.64 (33.77)	68900	164285	95385	2.38
T_3: Mesta - jowar	24.33	15.43	38.84 (14.51)	42500	108877	66377	2.56
T_4: Mesta - greengam	24.23	6.13	39.99 (15.76)	41900	111989	70089	2.67
T_5: Mesta - sunnhemp	24.13	20.73	68.50 (44.37)	39820	191973	152153	4.82
T_6: Mesta - blackgram	24.40	6.50	38.31 (13.91)	40420	107320	66900	2.66
SEm±	0.42	--	1.46	--	--	--	--
$CD_{(P=0.05)}$	NS	--	4.59	--	--	--	--

**: MEY of sequence crop (2^{nd} crop) in parenthesis*

Aduthurai (2020-21): The succeeding crop of mesta are to be harvested and the result of the trial will be presented later in 2021 Annual report.

Project NP (SUN-A) 5.7: Effect of sowing dates and varieties for seed yield maximization in sunnhemp

The experiment was conducted at Kalyani, Nagaon, Rahuri and Amadalavalasa to determine the optimum sowing date for maximization of seed yield of new sunnhemp varietis and the results are summarized below.

Kalyani (2019-20): The report of the trial conducted in 2019-20 could not be presented in AINPJAF Annual Report 2019 as the crop was harvested late and the results of 2019-20 are presented here which is as follows:

The perusal of data revealed that maximum seed yield of sunnhemp at Kalyani was recorded with 15th September sowing (21.80 q/ha) which was statistically at par with seed yield recorded on 30th September (20.00 q/ha) after which the yield decreased significantly (table 2.40). Among the varieties tested, maximum seed yield was recorded

with SUIN 053 (19.11 q/ha) and was in the order of SUIN 053 > SUIN 037 > JRJ 610 (table 2.40). The interaction effect of date of sowing and variety on seed yield was found non-significant at Kalyani, West Bengal.

Amadalavalasa (2019-20): The perusal of data of 2019-20 revealed that the maximum seed yield (23.78 q/ha) of sunnhemp was recorded with 30th September which was significantly higher than seed yield observed in other sowing dates while there were no significant variation in the number of branches/pnat, seeds/pod and 1000 seed weight between both 30th September and 15th October sowing dates (table 2.40). Among the varieties tested JRJ 610 recorded significantly higher seed yield of sunnhemp (24.85 q/ha) over other varieties and also higher values of the yield attributing characters of sunnhemp at Amadalavalasa, Andhra Pradesh (table 2.40).

Seed crop of sunnhemp at Amadalavalasa

Table 2.40 Effect of sowing dates and variety on seed yield and yield attributes of sunnhemp at Kalyani, West Bengal and Amadalavalasa, Andhra Pradesh during 2019-20

Treatments	Kalyani (2019-20)	Amadalavalasa (2019-20)				
	Seed yield (q/ha)	Branches /plant	Pods / plant	Seeds /pod	1000 seed weight (g)	Seed yield (q/ha)
Dates of Sowing						
D_1: 15th September	21.80	6.81	63.34	6.14	39.82	12.62
D_2: 30th September	20.00	9.72	91.32	11.15	41.38	23.78
D_3: 15th October	10.55	9.21	73.65	9.96	42.61	20.43
SEm±	0.65	0.29	1.98	0.32	0.39	0.87
$CD_{(P=0.05)}$	2.00	0.98	7.42	1.25	1.54	2.64
Variety						
V_1: JRJ 610	15.27	8.53	84.41	11.43	40.24	24.85
V_2: SUIN 037	17.97	6.51	64.57	9.56	38.76	18.76
V_3: SUIN 053	19.11	7.65	73.64	10.31	40.29	21.42
SEm±	0.65	0.3	1.07	0.63	0.29	0.95
$CD_{(P=0.05)}$	2.54	1.17	2.63	1.83	0.87	2.78

Kalyani (2020-21): The crop is in the field and results will be presented in Annual Report 2021.

Nagaon (2020-21): The trial was conducted but the experiment failed due to prolonged waterlogging due to heavy rainfall and poor drainage.

Amadalavalasa (2020-21): The crop is in the field and final data will be processed after harvesting of trial.

Rahuri: (2020-21): The crop is in the field and final data will be processed after harvesting of trial.

Ramie

NP(RA) 2.4 (modified): Yield maximization in ramie through improved management

The experiment was initiated at Barrackpore and Coochbehar, West Bengal and Sorbhog, Assam with an objective to determine the effect of planting methods and fertilizer on fibre yield of ramie and the results are summarized below.

Barrackpore: The fibre yield of ramie was significantly influenced by method of planting and fertilizer management at ICAR-CRIJAF, Barrackpore. Ridge and furrow method of planting recorded significantly higher fibre yield during

2nd (3.55 q/ha) and 4th (3.79 q/ha) and also in case of total fibre yield (13.95 q/ha) of ramie over other planting methods while in 1st and 3rd cuttings, fibre yield with ridge and furrow method was statistically at par with raised bed method (table 2.42).. The total fibre yield of ramie recorded with the INM treatments, i.e., F_4 [125% N from RDF (inorganic) + 25% N from FYM] (14.34 q/ha) and F_5 [125% N from RDF (inorganic) + 25% N from ramie compost] (14.58 q/ha) were statistically at par and were significantly higher than fibre yield with 150% recommended dose of nitrogen (RDN) (13.84 q/ha), while in all the individual cuttings, the fibre yield did not vary significantly among the three treatments (F_3, F_4 & F_5) (table 2.42). The interaction between method of planting and fertilizer management was found significant at ICAR-CRIJAF, Barrackpore. Highest fibre yield (16.35 q/ha) of ramie was recorded with S_3F_5 treatment which was at par with S_3F_4 treatment (16.26 q/ha) at Barrackpore, West Bengal (table 2.43).

Table 2.42 Effect of method of sowing and fertilizer on fibre yield of ramie at Barrackpore, West Bengal

Treatments	Fibre yield (q/ha)				
	1st cut	2nd cut	3rd cut	4th cut	Total
Methods of planting					
S_1: Flat bed	2.20	2.58	2.83	2.73	10.36
S_2: Raised bed	2.42	3.15	3.93	3.54	13.06
S_3: Ridge and Furrow	2.50	**3.55**	4.10	3.79	13.95
SEm±	0.04	0.04	0.06	0.03	0.10
$CD_{(P=0.05)}$	0.15	0.15	0.23	0.11	0.39
Fertilizer					
F_1: control					
F_2: 100% RDN (inorganic)	1.70	1.83	2.02	1.87	7.43
F_3: 150% N from RDN (inorganic)	2.39	2.93	3.66	3.09	12.08
F_4: 125% N from RDN (inorganic) + 25% N from FYM	2.50	3.49	4.06	3.78	13.84
F_5: 125% N from RDN (inorganic) + 25% N from ramie compost	2.65	3.55	4.10	4.02	14.34
SEm±	2.64	3.67	4.25	4.01	14.58
$CD_{(P=0.05)}$	0.07	0.08	0.09	0.10	0.18
	0.20	0.23	0.26	0.29	0.52

RDN: recommended dose of nitrogen

Table 2.43 Interaction of method of sowing and fertilizer on fibre yield of ramie at Barrackpore, West Bengal

Treatments	Total Fibre Yield (q/ha)		
	S_1: Flat bed	S_2: Raised bed	S_3: Ridge and Furrow
Fertilizer methods			
F_1: Control	6.60	7.76	7.93
F_2: 100% RDN (inorganic)	10.35	12.08	13.83
F_3: 150% N from RDN (inorganic)	11.46	14.67	15.41
F_4: 125% N from RDN (inorganic) + 25% N from FYM	11.59	15.17	16.26
F_5: 125% N from RDN (inorganic) + 25% N from ramie compost	11.79	15.60	16.35
SEm±	0.32		
$CD_{(P=0.05)}$	0.93		

RDN: recommended dose of nitrogen

Coochbehar: The perusal of data revealed that the effect of method of planting and fertilizer was significant on fibre yield of ramie in individual cuttings and also on total fibre yield of the crop. Total fibre yield as well as fibre yield of ramie in 1st and 2nd cuttings with ridge and furrow sowing (6.42 q/ha; 2.52 & 3.89 q/ha) and raised bed systems (6.11 q/ha; 2.44 & 3.67 q/ha) were statiscally at par and both the treatments recorded significantly higher fibre yield of ramie over flat bed planting (table 2.44). All the fertilizer treatments recorded significantly higher yield over control. The total fibre yield (total of 3 cuttings) of ramie recorded with 150% recommended dose of N (RDN) (6.50 q/ha) was statistically at par with the yield recorded with INM treatments (F_4 & F_5) comprising of 25% of the N from FYM / ramie compost (6.88 & 7.12 q/ha) at Coochbehar, West Bengal. Similar trend was recorded in individual cuttings also (table 2.44) thereby indicating a savings of 25% inorganic nitrogen even at higher recommended N dose. The interaction effect of planting method and fertilizer on fibre yield of ramie was found non-significant at Coochbehar, West Bengal.

INM in ramie at Coochbehar

Sorbhog: The effect of planting method on fibre yield of ramie was non-significant at all the cuttings as well as in case of total yield at Sorbhog, Assam. However, highest total fibre yield was recorded with flat planting method (16.31 q/ha) (table 2.44). The effect of fertilizer on fibre yield was found significant in 2nd cutting and in total fibre yield of ramie at Sorbhog, Assam. Maximum value of total fibre yield (16.14 q/ha) of ramie was recorded with 100% RDF treatment. The interaction on planting methods and fertilizer fertilizer on fibre yield of ramie was found significant and flat bed planting along with 100% RDF (S_1F_1) recorded significantly higher fibre yield (23.26 q/ha) over other treatments (table 2.45).

Table 2.44 Effect of method of sowing and fertilizer on fibre yield of ramie at Coochbehar, West Bengal and Sorbhog, Assam

Treatments	Fibre yield (q/ha)						
	Coochbehar			Sorbhog			
	1st cut	2nd cut	Total	1st cut	2nd cut	3rd cut	Total
Methods of planting							
S_1: Flat bed	2.10	3.03	5.14	7.67	4.10	4.53	16.31
S_2: Raised bed	2.44	3.67	6.11	5.86	3.89	4.42	14.18
S_3: Ridge and Furrow	2.52	3.89	6.42	6.30	3.93	4.03	14.27
SEm±	0.08	0.13	0.10	0.96	0.34	0.30	0.88
$CD_{(P=0.05)}$	0.31	0.50	0.39	NS	NS	NS	NS
Fertilizer							
F_1: Control	1.19	1.90	3.09	-	-	-	-
F_2: 100% RDN (inorganic)	2.40	3.47	5.87	8.05	3.88	4.20	16.14
F_3: 150% N from RDN (inorganic)	2.63	3.87	6.50	5.74	2.71	4.15	12.61
F_4: 125% N from RDN (inorganic) + 25% N from FYM	2.73	4.15	6.88	5.93	4.87	4.46	15.27
F_5: 125% N from RDN (inorganic) + 25% N from ramie compost	2.85	4.27	7.12	6.73	4.43	4.50	15.66
SEm±	0.11	0.19	0.24	0.60	0.34	0.29	0.81
$CD_{(P=0.05)}$	0.32	0.55	0.69	NS	1.00	NS	2.40

RDN: recommended dose of nitrogen

Table 2.45 Interaction of method of sowing and fertilizer on fibre yield of ramie at Sorbhog, Assam

Treatments	Total fibre yield (q/ha)		
	Mode of sowing		
	S_1: Flat bed	S_2: Raised bed	S_3: Ridge and Furrow
Fertilizer			
F_1: 100% RDN (inorganic	23.26	13.00	12.16
F_2: 150% N from RDN (inorganic)	14.20	11.36	12.26
F_3: 125% N from RDN (inorganic) + 25% N from FYM	14.96	15.60	15.26
F_4: 125% N from RDN (inorganic) + 25% N from ramie compost	12.83	16.76	17.40
SEm±	1.41		
$CD_{(P=0.05)}$	4.18		

NP(RA) 2.5: Interactive effect of nitrogen and potassium on fibre yield and fibre quality of ramie

The experiment was initiated at ICAR-CRIJAF, Barrackpore and Sorbhog, Assam with an objective to study the effect of nitrogen and potassium on fibre yield of ramie and the results are summarized below.

Barrackpore: The perusal of data revealed that the effect of nitrogen and potassium application on fibre yield of ramie was significant at Barrackpore, West Bengal. Increase in nitrogen dose increased fibre yield of ramie significantly up to 75 kg N/ha/cut dose all the cuttings and also in total yield (14.68 q/ha) (table 2.46). Application of potassium increased fibre yield of ramie significantly up to 50 kg K/ha/cut dose 3rd and 4th cuttings (4.12 & 3.61 q/ha) and in total fibre yield (13.48 q/ha) while in the 1st cutting, the increase was significant up to 25 kg k/ha/cut dose only. The effect of potassium on fibre yield of ramie was non-significant in 2nd cutting at Barrackpore, West Bengal (table 2.46). The interaction effect of N and K on fibre yield of ramie was significant and $N_{75}K_{50}$ treatment recorded significantly higher fibre yield of ramie (16.40 q/ha) over other treatment combinations (table 2.47).

Table 2.46 Effect of nitrogen and potassium on yield attributes and yield of ramie at Barrackpore, West Bengal

Treatments	Fibre yield (q/ha)				
	1st cut	2nd cut	3rd cut	4th cut	Total
Nitrogen level (kg/ha)					
N_1: 0	1.99	2.12	2.28	1.69	8.08
N_2: 25	2.61	2.70	4.06	3.05	12.43
N_3: 50	2.68	2.96	4.09	3.86	13.61
N_4: 75	2.89	3.42	4.24	4.11	14.68
SEm±	0.10	0.13	0.08	0.12	0.28
$CD_{(P=0.05)}$	0.31	0.41	0.25	0.38	0.89
Potassium level (Kg/ha)					
K_1: 0	2.22	2.60	3.01	2.68	10.53
K_2: 25	2.70	2.78	3.87	3.24	12.59
K_3: 50	2.71	3.02	4.12	3.61	13.48
SEm±	0.06	0.12	0.08	0.10	0.17
$CD_{(P=0.05)}$	0.17	NS	0.23	0.29	0.49

Table 2.47 Interaction effect of nitrogen and potassium on yield attributes and fibre yield of ramie at Barrackpore, West Bengal

Treatments	Total fibre yield (q/ha)		
	Potassium level (kg/ha)		
	K_1: 0	K_2: 25	K_3: 50
N_1: 0	8.21	7.73	8.30
N_2: 25	10.14	12.91	14.25
N_3: 50	11.38	14.49	14.97
N_4: 75	12.38	15.25	16.40
SEm±	0.34		
$CD_{(P=0.05)}$ **Nitrogen level (kg/ha)**	0.98		

Sorbhog: The experimental data revealed that the effect of nitrogen and potassium on yield attributing characters and fibre yield of ramie was non-significant at Sorbhog, Assam. However, the total fibre yield of ramie was found to be numerically higher with 75 kg N/ha (12.10 q/ha) and 25 kg K/ha (11.69 q/ha) treatments, respevtively (table 2.48).

Table 2.48 Effect of method of sowing and fertilizer on fibre yield of ramie at Sorbhog, Assam

Treatments	Fibre yield (q/ha)			
	1st cut	2nd cut	3rd cut	Total
Nitrogen level (kg/ha)				
N_1: 0	4.75	3.93	4.55	13.24
N_2: 25	3.16	2.80	3.88	9.85
N_3: 50	3.35	3.46	3.15	9.97
N_4: 75	4.37	4.36	3.35	12.10
SEm±	0.40	0.50	0.47	1.05
$CD_{(P=0.05)}$	NS	NS	NS	NS
Potassium level (kg/ha)				
K_1: 0	4.01	3.65	3.61	11.28
K_2: 25	4.00	3.80	3.88	11.69
K_3: 50	3.71	3.47	3.71	10.90
SEm±	0.31	0.31	0.36	0.66
$CD_{(P=0.05)}$	NS	NS	NS	NS

RDN: recommended dose of nitrogen

NP (FLA) 1.1: Fibre yield maximization in flax (2019-20)

The trial was conducted at Coochbehar, West Bengal to determine the effect of date of sowing, spacing and nitrogen on growth and fibre yield of flax. The results are summarized below for 2019-20 crop season for Coochbehar centre.

Coochbehar: The experimental data of 2019-20 revealed that the effect of date of sowing on plant height, basal diameter, green biomass, dry biomass and fibre yield of flax was significant at Cooch Behar. Maximum plant height (105.8 cm), basal diameter (0.41 cm), green weight (192.01 q/ha), dry weight (54.43 q/ha) and fibre yield

(18.05 q/ha) of flax was recorded with sowing on 1st week of November and it decreased progressively with delay in the sowing time. However, no significant variation was observed in fibre yield and green weight between the sowing on 1st November and 11th November though the dry weight did not decrease significantly till 21st November sowing (table 2.49). All the fertilizer treatments recorded significantly higher value of plant height, basal diameter, green biomass, dry biomass and fibre yield of flax though the value of the said parameters under study did not vary significantly among the fertilizer treatments (table 2.49). The interaction between date of sowing and nitrogen was found non-significant at Coochbehar, West Bengal.

Table 2.49 Effect of date of sowing, spacing and nitrogen on yield attributes and fibre yield of flax at Cooch Behar, West Bengal (2019-20)

Treatments	Plant height (cm)	Basal diameter (cm)	Green biomass (q/ha)	Dry biomass (q/ha)	Fibre yield (q/ha)
Date of sowing					
D_1 : 1st November	105.8	0.41	192.01	54.43	18.05
D_2 : 11th November	101.4	0.40	182.02	51.81	17.13
D_3 : 21st November	99.9	0.39	157.33	44.82	14.75
D_4 : 1st December	95.2	0.38	145.83	41.17	13.74
SEm±	1.8	0.006	9.23	2.79	0.85
$CD_{(P=0.05)}$	6.2	0.02	31.93	9.65	2.94
Fertilizer nitrogen (kg /ha)					
F_1 : 0	91.9	0.34	119.05	33.76	11.12
F_2 : 40	100.7	0.40	173.27	49.28	16.34
F_3 : 80	103.6	0.42	188.40	53.50	17.79
F_4 : 120	106.1	0.42	196.47	55.69	18.43
SEm±	2.0	0.005	9.89	3.00	1.03
$CD_{(P=0.05)}$	5.8	0.01	28.77	8.73	2.99

NP(FLA) 1.5: Intercropping of flax with smother crop for enhancing productivity and suppressing the weed (2019-20)

The experiment was initiated at Barrackpore, Coochbehar, Katihar and Nagaon in 2019-20 with an objective to determine suitable smother crops for weed control in flax and enhancing the productivity of flax. At Nagaon, the experiment was conducted for flax seed crop. The results of 2019-20 at different centres are presented below:

Barrackpore: The perusal of data revealed that intercropping of flax + spinach (2:1) recorded significantly higher system flax fibre equivalent yield (25.31 q/ha) over other intercropping systems and was followed by sole flax crop (19.70 q/ha) (table 2.50). The effect of intercropping on plant height, basal diameter and fibre yield of flax was non-significant at Barrackpore though the maximum value of all the parameters (124.2 cm, 0.42 cm & 19.70 q/ha, respectively) were recporded with sole flax crop.

Coochbehar: At Coochbehar, West Bengal, maximum fibre equivalent yield of flax was recorded with flax + corainder (2:1) (16.45 q/ha) followed by flax + grass pea (2:1) (15.90 q/ha) and flax + lentil (2:1) (15.23 q/ha) though the treatment effect was non-significant (table 2.50). Maximum gross return (Rs. 313250/ha), net return (Rs. 270570/ha) and B:C ratio (3.887.34) were recorded with flax : coriander (2:1) intercropping followed by flax + lentil (2:1) and flax + grass pea (2:1) system at Coochbehar, West Bengal (table 2.50).

Table 2.50 Effect of intercropping on fibre yield of fibre flax at Barrackpore and Coochbehar, West Bengal (2019-20)

Treatments	Barrackpore					Coochbehar		
	Plant height (cm)	Basal diameter (cm)	Flax fibre yield (q/ha)	Intercrop yield (q/ha)	Flax fibre equivalent yield (q/ha)	Flax fibre yield (q/ha)	Intercrop yield (q/ha)	Flax fibre equivalent yield (q/ha)
T_1: Sole flax	124.2	0.42	19.70	--	19.70	13.45	--	13.45
T_2: Flax + grass pea (2:1)	118.5	0.40	15.66	1.44	16.14	14.17	5.23	15.90
T_3: Flax + garden pea (2:1)	121.2	0.37	14.40	12.89	17.88	12.75	7.01	13.36
T_4: Flax + coriander (2:1)	114.8	0.39	14.20	3.80	16.74	14.75	9.20	16.45
T_5: Flax + spinach (2:1)	115.6	0.41	15.22	19.04	25.31	11.32	8.29	12.27
T_6: Flax + lentil (2:1)	115.3	0.40	15.49	2.18	16.24	14.62	6.80	15.23
SEm±	2.05	0.02	1.66	--	1.74	1.20	--	1.03
$CD_{(P=0.05)}$	NS	NS	NS	--	5.23	NS	--	NS

Flax + coriander at Barrackpore

Flax + lentil at Coochbehar

Katihar: The experimental result on intercropping of fibre flax at Katihar, Bihar revealed that among the different intercropping systems tried, the flax equivalent of only flax + lentil (2:1) (5.68 q/ha) and flax + coriander (2:1) (5.35 q/ha) was significantly higher than fibre yield of sole flax crop (4.57 q/ha) at Katihar, Bihar (table 2.51).

Nagaon: At Nagaon, maximum plant height of flax was recorded with flax + coriander (2:1) (120.0 cm) followed by flax + garden pea (2:1) (114.8 cm) and sole flax (107.1 cm) while green weight was maximum with sole flax crop (20.31 q/ha) followed by flax+ grass pea (2:1) (12.60) and flax + garden pea (2:1) (10.03 q/ha), respectively. Seed yield of flax was maximum with sole flax crop (12.91 q/ha) which was statistically at par with flax + lentil (12.20 q/ha) and both the sytems recorded significantly higher seed yield over the rest of the treatments at Nagaon, Assam. Minimum weed biomass was recorded with sole flax treatment (12.65 q/ha) followed by flax + garden pea treatment (table 2.51).

Flax + garden pea at Nagaon

Table 2.51 Effect of intercropping on fibre yield of flax at Katihar, Bihar and seed yield of flax at Nagaon, Assam

Treatments	Katihar, Bihar			Nagaon, Assam			
	Flax fibre yield (q/ha)	Intercrop yield (q/ha)	Flax fibre equivalent yield (q/ha)	Plant height (cm)	Green weight (q/ha)	Seed yield of flax (q/ha)	Weed biomass (q/ha)
T_1: Sole flax	4.57	--	4.57	107.1	20.31	12.91	12.65
T_2: Flax + grass pea (2:1)	4.17	0.28	4.26	97.0	12.60	6.70	27.65
T_3: Flax + garden pea (2:1)	4.50	0.41	4.61	114.8	10.03	5.91	15.60
T_4: Flax + coriander (2:1)	5.15	0.50	5.35	120.0	7.33	6.38	19.15
T_5: Flax + spinach (2:1)	4.02	5.94	4.79	97.6	8.28	7.46	29.20
T_6: Flax + lentil (2:1)	5.35	0.99	5.68	97.4	9.26	12.20	29.85
SEm±	0.11	--	0.12	1.1	0.35	0.34	0.85
$CD_{(P=0.05)}$	0.33	--	0.36	3.3	1.05	1.02	2.55

Sisal

NP (SIA) 5.2: Nutrient management in sisal

The trial was conducted at Bamra, Odisha and Amadalavalasa, Andhra Pradesh with an objective to determine the nutrient management schedule in sisal for higher productivity of the crop and the results are presented below:

Bamra: Trial is in the field.

Amadalavalasa: The experimental data revealed that maximum number of leaves/plant (32.2), leaf length (91.9), green leaf weight (475.13 q/ha) and fibre yield (15.88 q/ha) of sisal was recorded with Leela variety though the effect of variety on the value of green weight and fibre yield was non-significant. Maximum leaf length (100.79 cm) and leaf width (11.10 cm) was recorded with local variety (table 2.53). Nutrient management significantly influenced number of leaves/plant, leaf length, leaf width, green biomass and fibre yield of sisal crop at Amadalavalasa, Andhra Pradesh. Maximum value of leaves/plant (38.0), green leaf biomass (597.16 q/ha) and fibre yield of sisal (19.81 q/ha) was recorded with F_8 INM treatment (NPK @ 60:13:50 kg/ha + vermi-compost @ 2.5 t/ha) which were statistically at par with the corresponding values recorded with F_9 INM treatment (NPK @ 90:13:50 kg/ha + vermi-compost @ 2.5 t/ha) while maximum value of leaf length (102.0 cm) and leaf width (11.30 cm) were recorded with T_9 treatment (table 2.53). The interaction effect of variety and fertilizer on fibre yield of sisal was found non-significant at Amadalavalasa, Andhra Pradesh.

INM in sisal at Amadalavalasa

Table 2.53 Effect of integrated nutrient management on yield attributes and fibre yield of sisal at Amadalavalasa, Andhra Pradesh

Treatments	Number of leaves/plant	Leaf length (cm)	Leaf width (cm)	Green biomass (q/ha)	Fibre yield (q/ha)
Variety					
V_1 : Local	27.30	100.79	11.10	465.58	15.30
V_2 : Leela	32.16	91.97	10.22	475.13	15.88
SEm+	0.37	0.16	0.05	4.91	0.16
$CD_{(P=0.05)}$	2.24	0.97	0.30	NS	NS
Fertilizer					
F_1 : Control (No fertilizer)	23.16	86.03	9.81	369.83	12.25
F_2 : 30 : 13 : 50	23.83	91.71	10.16	380.33	12.59
F_3 : 60: 13 : 50	25.16	94.86	10.35	400.16	13.26
F_4: 90 : 13 : 50	29.00	98.43	10.46	459.58	15.23
F_5 : 120 : 13 : 50	31.33	98.50	10.75	494.83	16.40
F_6 : F_3 + sisal waste @ 20 t/ha	27.33	97.35	10.86	434.91	14.40
F_7 : F_4 + sisal waste @ 20 t/ha	32.16	96.76	11.01	507.91	16.83
F_8 : F_3 + vermi-compost @ 2.5 t/ha	38.00	99.73	11.30	597.16	19.81
F_9 : F_4 + vermi-compost @ 2.5 t/ha	37.66	102.01	11.46	590.16	19.58
F_{10} : F_3 + Poultry manure @ 4 t/ha	29.66	98.43	10.45	468.66	15.53
SEm	1.59	0.76	0.13	24.87	0.82
$CD_{(P=0.05)}$	4.53	2.16	0.37	70.87	2.33

Fertilizer: $N:P_2O_5:K_2O$, kg/ha

NP(SIA) 5.3: Performance evaluation of short duration pulses and oilseed crops grown in inter rows of sisal

The trial was initiated at Bamra, Odisha and Amadalavalasa, Andhra Pradesh in 2016 to identify suitable intercrops for sisal under rainfed cultivation system to increase the fibre productivity as well as profitability of the system and the centre wise data are presented below.

Bamra: The intercrops are in the field and the data will be reported after the harvest of the trial is completed.

Amadalavalasa: The intercrops are in the field and the data will be reported after the harvest of the trial is completed.

Crop Protection

During 2020 crop season, a total of 12 projects comprising of 40 trials were conducted under crop protection programme of which 6 projects comprising 25 trials were under jute, 03 projects comprising 07 trials were under mesta and one project under flax comprising of 02 trials and two projects on sunnhemp comprising 06 trials.

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

The project was allotted to Barrackpore, Coochbehar, Kendrapara, Katihar, Nagaon and Amadalavalasa centres and the Centre wise data are presented below:

Nagaon: Survey was conducted only at RARS, AAU, and Shillongani regions of Nagaon districts due to restricted movement created by COVID-19 situation. Sowing of the crop was also delayed due to lockdown situation. Among the insect pests, during survey, Bihar hairy caterpillar, yellow mite and jute semilooper were recorded as important insect pests of jute. Yellow mite infestation was recorded on 30-45 day old crops. The peak infestation of jute hairy caterpillar and semilooper was highest with infestation of 26.33 and 9.72% respectively at 85 and 120 DAS. The infestation of yellow mite was negligible with maximum infestation of 1.70 mites/ cm^2 at 35 DAS. Root rot and stem rot are the major disease of jute observed. Root rot started from 55 day old crop and gradually increased with the crop age to attain a peak of 11.37 percent plant damage at harvesting stage. Stem rot incidence was highest at 120 day old crop (PDI 8.34) (table 3.1). For the record of natural enemies' infestation in field condition, the larvae of Bihar hairy caterpillar and jute semilooper were reared in the laboratory to study probable parasitization of the insects. No parasite for semilooper was observed, but a tachinid fly, *Blepherella lateralis* parasitized Bihar hairy caterpillar up to 22.50 % and 17.50% on 30.6.2020 and 12.7.2020 respectively (table 3.2).

Table 3.1 Survey of major insect pests and diseases of jute at Nagaon, Assam

Location: RARS, Shillongani; Variety: JRO 204 Date of sowing: 05.05.2020							
DAS & Date	Insect Pests Infestation (%)				YM population (no/cm^2)	Disease	
	BHC	SL	Mealy bug	YM		RR (%)	SR(PDI)
25 DAS (21.5.20)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35 DAS (6.6.20)	0.00	3.61	0.00	10.28	1.70	0.00	0.00
45 DAS (17.6.20)	6.78	0.00	0.00	6.67	0.93	0.00	0.00
55 DAS (30.6.20)	11.46	8.43	0.00	0.00	0.00	3.42	0.00
65 DAS (11.7.20)	18.58	6.48	0.00	0.00	0.00	3.78	0.00
75 DAS (23.7.20)	23.42	11.43	1.11	0.00	0.00	5.68	2.61
85 DAS (01.8.20)	26.33	9.72	1.89	0.00	0.00	6.00	3.46
95 DAS (13.8.20)	19.72	7.33	3.89	5.00	0.70	8.34	4.09
105 DAS (24.8.20)	16.24	0.00	4.72	0.00	0.00	9.26	6.73
120 DAS (04.9.20)	12.56	0.00	5.83	0.00	0.00	11.37	8.34

Table 3.2 Study on parasitization of Bihar hairy caterpillar and jute semilooper in the laboratory at Nagaon, Assam

Date	Bihar Hairy Caterpillar			Semilooper		
	No. reared	No. Parasitized	% parasitization	No. reared	No. Parasitized	% parasitization
30.06.20	40.00	9.00	22.50	20.00	0.00	0.00
12.07.20	40.00	7.00	17.50	20.00	0.00	0.00
24.07.20	40.00	0.00	0.00	20.00	0.00	0.00
01.08.20	40.00	0.00	0.00	20.00	0.00	0.00

Coochbehar: Data was recorded for infestation of insect pests and incidence of diseases in this Survey. Two locations were selected for data collection viz. Research Farm of UBKV and Paschim Mallik Para villages of Dhupguri. The yellow mite, semilooper and Bihar hairy caterpillar were the major insect pests in both the locations surveyed. The yellow mite infestation (no. of mite/cm^2 area of second unfold leaf) was maximum with 3.90 mite/cm^2 and 6.27 mite/cm^2 at UBKV Research plot (65 DAS, 3rd week of July) and Paschim Mallik Para (45 DAS, 4th week of May) respectively. The highest infestation of semilooper was noticed at Paschim Mallik Para village of Dhupguri with 12.63% at 45 DAS and minimum infestation 0.61 % was observed at 65 DAS. Bihar hairy caterpillar infestation started from 45 DAS (4th week of May) at Paschim Mallik Para, Dhupguri (45 DAS, 4th week of May) which continued till harvest of the crop with peak infestation during third week of June (15.56%). Parasitization of Bihar hairy caterpillar by Tachinid fly was 14.33% at Pundibari during the month of July (table 3.3).

Table 3.3 Survey of major insect pest of jute at Coochbehar, West Bengal

DAS/Date	Mite (No./cm^2 of 2nd unfold leaf)	Semilooper (% infestation)	Bihar Hairy Caterpillar (% infestation)
Location 1: UBKV, Pundibari			
25DAS (11.06.2020)	0.00	0.00	0.00
35DAS (21.06.2020)	0.00	4.06	0.00
45DAS (01.07.2020)	0.00	9.12	0.00
55DAS (11.07.2020)	1.83	3.90	4.45
65DAS (21.07.2020)	3.90	0.00	12.78
75DAS (31.07.2020)	0.86	0.00	5.91
Location 2: Dhupguri (Paschim Mallik para)			
25DAS (06.05.2020)	0.00	0.00	0.00
35DAS (16.05.2020)	1.89	3.55	0.00
45DAS (26.05.2020)	6.27	12.63	3.61
55DAS (05.06.2020)	1.46	6.02	7.56
65DAS (15.06.2020)	0.00	0.61	15.56
75DAS (25.06.2020)	0.00	0.00	6.20

Coochbehar: The observation was recorded for stem rot and root rot incidence. Maximum stem rot severity at the survey period was recorded at Dinhata (32.96%) followed by UBKV (18.79%). However, root rot

incidence was maximum in UBKV (29.22%). Higher increase in stem rot severity was noted from 55 DAS onwards while root rot generally appeared 55 days after sowing. The root rot incidences in Dinhata were 26.61% 90 DAS (table 3.4).

Table 3.4 Survey of major diseases of jute at Coochbehar, West Bengal

DAS/Date	Disease incidence	
	Stem rot(PDI)	Root rot (%)
Location 1: UBKV (Pundibari)		
30 DAS (16.06.20)	0.00	0.00
45 DAS (01.07.20)	0.65	0.00
60 DAS (16.07.20)	1.18	10.96
75 DAS (31.07.20)	7.42	22.86
90 DAS (17.08.20)	18.79	29.22
Location 2: Dinhata		
30 DAS (15.05.20)	0.00	0.00
45 DAS (30.05.20)	0.93	0.00
60 DAS (15.06.20)	7.37	11.24
75 DAS (30.06.20)	18.11	20.82
90 DAS (16.07.20)	32.96	26.61

Kendrapara: Survey was conducted at three locations such as Raghunathpur, Silipur and Research Farm, JRS, Kendrapara to assess the infestation of insect pest and diseases of jute. The yellow mite, semilooper, stem weevil and Bihary hairy caterpillar were observed in all the locations surveyed. The yellow mite infested plant was maximum i.e., 12% at village Raghunathpur of Marsaghai block (45 DAS) and 11.11% at village Silipur of Marsaghai block (45DAS) respectively, whereas in Research Farm of JRS, Kendrapara, the infestation of yellow mite was 8.89% at 45DAS during 1st week of June. In all the three locations maximum infestation of mite was recorded at 45DAS. In village Silipur, the semilooper infestation was maximum 27.91% at 85 DAS as compared to 26.19% and 22.22% plant damage at Raghunathpur village and Research Farm of JRS, Kendrapara respectively during 85 DAS. Apion infestation was maximum of 13.33% in village Silipur of Marsaghai block at 45 DAS as compared to 8.89% and 11.11% at village Raghunathpur and Research Farm, JRS, Kendrapara respectively. The Bihar hairy caterpillar (BHC) infestation was maximum (28.22%) at Research Farm, JRS, Kendrapara at 85DAS.There is no report of mealybug and cockchaffer beetle in all three locations.

Likewise, the survey was conducted to assess the intensity of jute diseases. It was observed that the stem rot disease was maximum (15.59%) at Reseach Farm, JRS, Kendrapara at 85 DAS. In village Silipur the incidence of stem rot was less (8.82%) at 85 DAS. The root rot disease incidence was highest (16.99%) at village Raghunathpur at 85 DAS and (15.19%) at village Silipur. The leaf mosaic was reported in KJC-7 varieties maximum (13.27%) at JRS, Kendrapara. Anthracnose disease was noticeable in JRO-524 variety in four locations of Kendrapara district with maximum incidence (9.41%) at village Raghunathpur of Kendrapara district (table 3.5).

Table 3.5 Survey and surveillance of insect pests and diseases of jute at Kendrapara, Odisha

	Insect Pest Incidence (%)				Disease incidence (%)			
DAS / Date	Semilooper	Apion	Yellow mite	BHC	Stem Rot	Root Rot	Mosaic	Anthracnose
Location: Raghunathpur, Marsaghai DOS-09.05.2020 Variety-JRO-524								
45 DAS (03.07.2020)	13.33	8.89	12.00	0.00	4.72	0.00	0.00	0.00
55 DAS (13.07.2020)	16.28	9.30	6.98	0.00	4.69	2.90	0.00	0.00
65 DAS (23.07.2020)	20.93	6.98	4.65	0.00	7.29	6.00	0.00	0.00
75 DAS (02.08.2020)	23.81	4.76	2.38	0.00	9.85	13.99	0.00	8.63
85 DAS (12.08.2020)	26.19	2.38	2.27	0.00	15.59	16.99	0.00	9.41
Location: Silipur ,Marsaghai DOS-13.05.20 Variety-JRO-524								
45 DAS (07.07.2020)	15.56	13.33	11.11	0.00	4.03	0.00	0.00	0.00
55 DAS (17.07.2020)	17.78	11.11	8.89	0.00	5.18	3.70	0.00	0.00
65 DAS (27.07.2020)	20.00	4.44	6.67	0.00	8.46	5.19	0.00	0.00
75 DAS (06.08.2020)	25.58	4.65	2.33	0.00	11.88	7.81	0.00	5.51
85 DAS (16.08.2020)	27.91	2.22	2.17	0.00	8.82	15.19	0.00	6.63
Location: Research Farm, JRS, Kendrapara , DOS-23.04.2020,Variety-JRO-204, KJC-7								
45 DAS (07.06.2020)	13.33	11.11	8.89	0.00	4.04	0.00	0.00	0.00
55 DAS (17.06.2020)	16.00	8.00	4.00	0.00	6.39	5.28	7.20	0.00
65 DAS (27.06.2020)	16.00	4.00	6.00	14.00	10.40	8.61	8.80	0.00
75 DAS (07.07.2020)	20.00	2.22	4.44	24.00	14.33	11.70	10.23	6.14
85 DAS (17.07.2020)	22.22	2.17	2.22	28.22	12.35	14.00	13.27	7.10

Barrackpore: Survey could not be conducted due to COVID-19 lockdown.

Katihar: Survey could not be conducted due to COVID-19 lockdown.

Amadalavalasa: Survey programme was carried out at different Mandals in both Srikakulam and Vizianagaram Districts of Andhra Pradesh and results revealed that incidence of semiloopers was more (0 to 51.33% leaf damage) in the surveyed locations and recorded higher incidence at Amadalavalasa Mandal of Srikakulam District ranging from 5.33 to 51.33 %% leaf damage. Mealybug incidence was more among the sucking pests in surveyed locations and recorded 0 to 42 %% at 45 days after sowing (DAS), 0 to 77 %% at 55 DAS, 0 to 44 %% at 65 DAS and 0 to 35 % during 75 DAS. However, mealybug incidence was high at Agricultural Research Station, Amadalavalasa and ranging from 18.00 to 50.66 %. Higher incidence of whiteflies was observed in Amadalavalasa and Burja Mandals of Srikakulam District with population ranging from 0.00 to 0.52 and 0.00 to 1.80 whiteflies per plant, respectively. Incidence of aphids was completely absent in surveyed locations except in Therlam Mandal of Vizianagaram District with population of 0.00 to 10.82 aphids per plant. Leafhopper incidence was also low during *kharif*, 2020 season with higher population of 0.10 to 0.72 leafhoppers per plant was recorded at Agricultural Research Station, Amadalavalasa (table 3.6).

Survey of insect pests in Amadalavalsa

Table 3.6 Survey and surveillance of insect pests in mesta at Amadalavalasa, Andhra Pradesh

District	Mandal	Village	Variety	Insect pest incidence																			
				Number												%							
				Aphids/plant				Whiteflies/plant				Leafhoppers/plant				Leaf damage by Semilooper				Mealybug incidence			
				45 DAS	55 DAS	65 DAS	75 DAS	45 DAS	55 DAS	65 DAS	75 DAS	45 DAS	55 DAS	65 DAS	75 DAS	45 DAS	55 DAS	65 DAS	75 DAS	45 DAS	55 DAS	65 DAS	75 DAS
	Amadalavalasa	ARS, Amadalavala	AMV-5	0.00	0.00	0.00	0.00	0.44	0.04	0.08	0.02	0.72	0.20	0.10	0.10	43.33	18.00	27.33	50.66	16.00	9.00	9.00	8.00
		Chintalapeta	Local	0.00	0.00	0.00	0.00	0.52	0.20	0.00	0.00	0.00	0.00	0.00	0.00	51.33	14.33	8.67	5.33	0.00	12.00	23.00	32.00
Srikakulam	Burja	Salikam 1	AMV-5	0.00	0.00	0.00	0.00	1.02	0.24	0.18	0.14	0.04	0.06	0.10	0.16	19.00	14.00	10.33	7.67	0.00	13.00	24.00	35.00
		Salikam 2	Local	0.00	0.00	0.00	0.04	0.60	0.18	0.08	0.00	0.00	0.00	0.04	0.10	19.00	11.67	10.33	8.00	2.00	77.00	44.00	16.00
		GKR Puram	Local	0.00	0.00	0.00	0.00	1.80	0.48	0.12	0.02	0.72	0.00	0.00	0.00	16.67	9.67	6.33	3.67	7.00	49.00	34.00	22.00
		Kalaparti	Local	0.00	0.00	0.00	0.00	0.22	0.34	0.12	0.00	0.00	0.00	0.00	0.00	19.00	11.00	8.00	4.33	0.00	17.00	9.00	4.00
	Jalumuru	Yelamanchili -1	Local	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.33	5.67	7.67	9.33	2.00	12.00	21.00	33.00
		Yelamanchili -2	Local	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	1.00	13.67	12.00	10.33	42.00	47.00	27.00	14.00
		Kaminaidupeta	Local	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.67	24.00	15.33	4.67	2.00	11.00	7.00	4.00
		Akkurada	Local	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	10.67	7.67	4.33	0.00	5.00	2.00	0.00
Vizianagaram	Therlam	Amiti	Local	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.06	3.33	2.00	5.00	13.00	15.00	63.00	31.00	14.00
		Sathiwada	Local	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.08	0.00	0.00	0.28	0.00	0.00	6.33	5.67	6.33	0.00	6.00	24.00	5.00
		Goluguvalasa	Local	0.00	0.46	7.98	10.82	0.16	0.00	0.06	0.08	0.20	0.08	0.04	0.00	9.00	3.00	5.00	9.33	17.00	7.00	5.00	8.00
		Koratam	Local	8.54	0.86	0.98	4.74	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	2.67	11.00	12.33	5.00	6.00	3.00	5.00	12.00
	Balijipeta	Chilakalapalli	Local	0.00	0.00	1.50	1.64	0.22	0.00	0.10	0.22	0.00	0.00	0.00	0.00	5.33	19.67	4.00	4.67	24.00	36.00	16.00	21.00
		Vengapuram	Local	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	2.67	6.00	5.00	0.00	0.00	1.00	2.00
		Tumarada	Local	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.33	5.00	2.33	0.00	2.00	0.00	21.00
		Chellimpalli	Local	0.00	0.00	0.00	0.10	0.10	0.00	0.00	0.04	0.00	0.00	0.00	0.00	6.00	2.67	4.67	3.67	0.00	2.00	17.00	7.00

NP(JPE) 1.0a: Screening of jute germplasm against insect pests and disease

The project was allotted to Coochbehar, Kendrapara, Katihar and Nagaon centres and the centre wise data are presented below:

Nagaon: Fifty number of *olitorius* germplasm along with varieties JRO-524 and JRO-204 considered as check were screened against insect pests. Plant damage by Bihar hairy caterpillar was maximum in OIN-174 (31.18 %) followed by OIN-159 (29.75 %). Lower infestation was observed in OIN-153 (12.33 %), OIN-139 (12.82%), OIN-136 (12.95%), OIN-138 (15.37 %). Entry OIN-153 (3.57%), OIN-172 (5.15%), OIN-151 (5.71%), OIN-145 (5.97%) and OIN-167 (5.93%) recorded lower semilooper infestation. Higher infestation of semilooper was observed on OIN-184 (14.43%), OIN-179 (14.26%) and OIN-181 (14.16%). Highest yellow mite population was recorded on OIN-173 (2.73 no/sq. cm) closely followed by OIN-148 (2.47 no/sq. cm), OIN-169 (2.27 no/sq.cm), OIN-162 (2.13 no/sq.cm). Lower mite population was recorded on OIN-138, OIN-142, OIN-148, OIN-149, OIN-172, OIN-178 as 0.75, 0.58, 0.33, 0.58, 0.58, and 0.67 no/sq.cm of second unfolded leaf (table 3.7).

Entry OIN-141 was free from root rot infestation. Lower root rot infestation was observed on OIN-145 (0.90%), OIN-151 (0.83%), OIN-157 (2.37%), OIN-166 (2.21%), OIN-174 (2.48%), OIN-175 (2.34%) and OIN-180 (2.27%). OIN-176 and OIN-177 were most susceptible to root rot with 16.72 and 16.32% disease incidence respectively. PDI for stem rot was lower for OIN-138 (0.75), OIN-142 (0.58), OIN-148 (0.33), OIN-149 (0.58), OIN-172 (0.58) and OIN-178 (0.67) (table 3.7).

Table 3.7 Performance of olitorius jute germplasm against insect pests and diseases at Nagaon, Assam

Entries	Plant Damage (%)		Yellow mite population (no/ cm^2)	Root Rot (%)	Stem Rot (PDI)
	Semilooper	Bihar Hairy Caterpillar			
OIN-136	8.45	12.95	1.67	11.55	4.58
OIN-137	12.36	17.07	0.53	14.14	4.33
OIN-138	11.71	15.37	0.93	8.04	0.75
OIN-139	11.34	12.82	1.53	8.67	3.83
OIN-140	12.49	23.82	1.20	7.41	4.08
OIN-141	9.28	17.73	1.67	0.00	2.92
OIN-142	11.04	22.20	0.67	4.48	0.58
OIN-143	11.55	27.73	1.53	8.96	3.17
OIN-144	7.35	16.61	1.80	5.39	3.75
OIN-145	5.97	21.61	1.53	0.90	2.83
OIN-146	9.58	21.32	1.73	11.34	3.42
OIN-147	12.65	20.14	1.13	6.24	4.33
OIN-148	8.99	22.67	2.47	12.04	0.33
OIN-149	9.92	23.25	1.40	8.67	0.58
OIN-150	9.50	18.12	1.00	9.00	4.17
OIN-151	5.71	22.14	1.47	0.83	4.42
OIN-152	8.66	21.75	1.87	11.25	5.42
OIN-153	3.57	12.33	1.27	15.53	4.25
OIN-154	7.48	19.64	1.00	8.11	6.00
OIN-155	11.16	18.41	1.93	7.50	4.25

Entries	Plant Damage (%)		Yellow mite population (no/ cm²)	Root Rot (%)	Stem Rot (PDI)
	Semilooper	Bihar Hairy Caterpillar			
OIN-156	12.17	17.59	1.60	7.41	3.00
OIN-157	6.46	19.55	0.67	2.37	5.33
OIN-158	12.12	25.95	1.07	7.31	4.42
OIN-159	11.94	29.75	1.40	6.20	2.33
OIN-160	12.84	22.40	2.00	14.82	3.17
OIN-161	13.39	21.01	1.27	7.90	4.08
OIN-162	10.06	18.60	2.13	14.57	1.42
OIN-163	6.26	22.83	1.00	8.97	4.42
OIN-164	11.96	24.37	0.73	11.99	5.17
OIN-165	12.33	20.69	1.93	6.39	4.25
OIN-166	9.71	25.17	1.73	2.21	3.92
OIN-167	5.93	23.69	0.93	10.84	7.25
OIN-168	7.53	20.19	0.53	4.23	1.17
OIN-169	9.87	22.43	2.27	9.72	3.25
OIN-170	9.01	16.74	1.27	7.66	4.33
OIN-171	13.83	21.61	1.20	7.29	3.33
OIN-172	5.15	26.28	1.73	11.68	0.58
OIN-173	7.93	23.80	2.73	11.37	3.00
OIN-174	13.63	31.18	2.07	2.48	3.92
OIN-175	8.80	18.76	1.93	2.34	4.58
OIN-176	15.50	21.08	0.93	16.72	6.50
OIN-177	9.97	21.23	0.80	16.36	4.58
OIN-178	10.19	17.69	2.27	9.03	0.67
OIN-179	14.26	17.31	1.80	7.26	5.58
OIN-180	12.55	21.39	2.07	2.27	5.17
OIN-181	14.16	20.76	0.73	4.49	7.00
OIN-182	9.69	23.28	1.27	10.50	1.25
OIN-183	10.66	23.08	1.20	7.30	7.58
OIN-184	14.43	22.77	1.13	10.95	5.50
OIN-185	9.69	23.09	1.60	8.11	4.25
JRO 524+	10.94	19.89	2.53	4.12	1.42
JRO 204+	10.84	25.92	1.87	4.76	2.67

+: check variety

Nagaon: Negligible infestation of insect pests and mite was observed in *capsularis* germplasm. Both root and stem rot disease was prevalent among *capsularis* germplasm. Lower root rot infestation was observed on CIN-150 (2.70%), CIN-174 (3.37%), CIN-173 (3.89%) and JRC-517 (4.28%). PDI for stem rot was lower for CIN-162 (0.33), CIN-165 (0.92), CIN-138 (1.75), CIN-140 (1.50), CIN-143 (1.58), CIN-148 (1.67), CIN-154 (1.83) and CIN-159 (1.75) (table 3.8)

Table 3.8 Performance of *olitorius* jute germplasm against diseases at Nagaon, Assam

Germplasms	Root Rot (%)	Stem Rot (PDI)	Germplasms	Root Rot (%)	Stem Rot (PDI)
CIN-136	15.37	6.17	CIN-163	19.02	4.37
CIN-137	9.34	2.67	CIN-164	9.93	6.58
CIN-138	9.80	1.75	CIN-165	7.78	0.92
CIN-139	13.42	6.83	CIN-166	11.76	5.67
CIN-140	10.68	1.50	CIN-167	13.08	9.08
CIN-141	9.20	8.08	CIN-168	5.50	2.00
CIN-142	13.07	4.08	CIN-169	11.22	6.08
CIN-143	12.03	1.58	CIN-170	7.56	6.75
CIN-144	12.25	7.08	CIN-171	13.06	7.25
CIN-145	9.08	7.92	CIN-172	11.82	8.58
CIN-146	13.85	6.83	CIN-173	3.89	8.17
CIN-147	9.61	6.25	CIN-174	3.37	7.08
CIN-148	7.80	1.67	CIN-175	12.42	1.58
CIN-149	8.79	2.33	CIN-176	13.42	5.25
CIN-150	2.70	8.50	CIN-177	7.32	5.17
CIN-151	13.64	6.58	CIN-178	14.33	8.00
CIN-152	13.29	7.17	CIN-179	11.24	6.33
CIN-153	12.77	7.92	CIN-180	14.93	3.00
CIN-154	10.04	1.83	CIN-181	15.90	7.42
CIN-155	8.35	7.33	CIN-182	10.66	7.33
CIN-156	8.39	5.83	CIN-183	12.64	2.58
CIN-158	11.56	8.83	CIN-184	9.54	8.00
CIN-159	11.27	1.75	CIN-185	9.48	4.42
CIN-160	13.17	7.42	CIN-186	9.54	8.42
CIN-161	11.60	8.25	JRC-517	4.28	5.92
CIN-162	10.68	0.33	JRC-698	7.68	2.33

Coochbehar: Forty *olitorius* germplasms were evaluated against insect pests. Yellow mite population was considerably low. Among the germplasms, significantly higher yellow mite incidence (number/sq. cm of 2nd unfold leaf) was noticed in OIN-151, JRO 204, JRO-524, OIN-161 and OIN-162 (6.21-7.16/cm^2). The entries of germplasm viz. OIN-149 and OIN-181 were found to be completely immune against yellow mite infestation with no damage. The higher percentage of Bihar hairy caterpillar damage was recorded in OIN-149, JRO-524, OIN-166, JRO-204, OIN-150 and lower caterpillar damage was noticed in OIN-153, OIN-142 & OIN-163. Comparatively lower % of semilooper damage was recorded in OIN-151, OIN-141, OIN-181(1.25-1.58) and higher % of semilooper damage was found in OIN-167, JRO-524, JRO-204, OIN-161 & OIN-175 (8.12-8.46%) (table 3.9).

Table 3.9 Evaluation of *olitorius* jute germplasm against insect pests at Coochbehar, West Bengal

Germplasms	YM (No./cm²)	SL (%)	BHC (%)	Germplasms	YM (No./cm²)	SL (%)	BHC (%)
OIN-140	4.55	3.57	5.32	OIN-166	2.65	4.94	20.17
OIN-141	3.08	1.43	4.19	OIN-167	4.47	9.56	11.09
OIN-142	1.92	2.48	2.84	OIN-168	0.60	2.71	13.82
OIN-143	2.24	6.86	12.74	OIN-171	4.76	3.23	8.63
OIN-146	3.25	3.86	6.16	OIN-172	5.22	5.29	17.01
OIN-147	1.90	2.06	4.02	OIN-173	4.11	6.85	7.42
OIN-148	3.18	7.32	15.73	OIN-174	3.69	4.60	5.68
OIN-149	0.00	4.70	21.52	OIN-175	3.50	8.12	9.20
OIN-150	2.60	2.84	19.26	OIN-176	3.29	5.45	18.69
OIN-151	7.16	1.25	10.62	OIN-177	6.04	4.00	12.10
OIN-152	1.34	4.91	7.92	OIN-178	1.30	2.27	4.66
OIN-153	1.62	2.76	2.51	OIN-179	3.61	4.38	15.49
OIN-154	2.10	4.04	14.55	OIN-180	3.11	5.60	10.36
OIN-159	1.65	7.04	9.44	OIN-181	0.00	1.58	3.95
OIN-160	4.04	5.69	7.71	OIN-182	2.60	2.64	5.29
OIN-161	6.36	8.33	3.44	OIN-183	5.73	3.04	6.06
OIN-162	6.20	7.80	11.02	OIN-184	1.43	1.65	4.74
OIN-163	4.35	5.46	3.17	OIN-185	1.03	6.46	11.79
OIN-164	2.46	6.21	3.73	JRO 524+	6.83	8.50	20.78
OIN-165	0.29	2.59	3.70	JRO 204+	6.97	8.46	20.08

YM=Yellow mite (no/cm² area from second unfold leaf); SL=Semilooper (% damage), BHC= Bihar Hairy Caterpillar (% damage)

Coochbehar: Similarly in *capsularis* germplasms, yellow mite, semilooper and BHC infestation was found in all the entries. Among the *capsularis* accessions, significantly higher yellow mite incidence (number/sq. cm of 2nd unfold leaf) was recorded in JRC-698, JRC-517, CIN-160, CIN-175 & CIN-185 (5.14-5.68/cm²) and lower mite population was noticed in CIN-149, CIN-167 & CIN-148 (0-0.9/cm²). Bihar hairy caterpillar infestation ranged from 2.13% (CIN-171) to 17.96% (JRC-698). Comparatively lower percentage of semilooper damage was recorded in CIN-171, CIN-151, CIN- 148 and CIN-167 (table 3.10).

Coochbehar: Among 40 germplasm (including 2 checks) of *olitorius* accessions better performing accessions against stem rot were namely, OIN-142(5.12%), OIN-147(4.89%), OIN-148(8.36%), OIN-149(7.34%), OIN-168(8.25%), OIN-178(9.13%) and OIN-181(5.78%). Most susceptible accession of stem rot wasOIN-150 (19.87%) followed by OIN-173(18.54%), OIN-153(17.34%) and OIN-154(17.25%). Both the checks show moderately susceptible towards stem rot, JRO-524(13.23%) and JRO-204 (10.48%). Moderately susceptible accessions were namely, OIN-140 (11.64%), OIN-141(11.39%), OIN-143 (10.29), OIN-146 (12.38), OIN-159 (13.45), OIN-171(13.31%), OIN179 (10.12), OIN-180(10.23), OIN-184 (10.13), OIN-185 (10.43). In case of Root rot incidence, lowest root rot was observed in accessions namely OIN-142 (6.23%), OIN-147(5.34), OIN-149(8.23%), OIN-164(9.67%), OIN-168(7.34%), OIN-174 (8.87%), OIN-181(8.98%) and OIN-184(9.35%). Highest root rot was observed in OIN-167 (20.98%), OIN-150 (20.97%), OIN-164 (20.36%) and OIN-153 (20.23%) (table 3.11).

Table 3.10 Evaluation of *capsularis* jute germplasm against insect pests at Coochbehar, West Bengal

Germplasms	YM (No./cm²)	SL (%)	BHC (%)	Germplasms	YM (No./cm²)	SL (%)	BHC (%)
CIN-136	4.02	1.50	3.00	CIN-168	2.31	4.99	4.48
CIN-137	3.29	2.99	5.45	CIN-169	1.83	4.97	2.69
CIN-138	1.60	3.87	4.46	CIN-170	3.63	2.63	5.60
CIN-139	3.22	6.33	9.19	CIN-171	2.09	0.89	2.13
CIN-140	3.14	3.11	7.53	CIN-172	2.63	1.97	3.37
CIN-147	4.67	4.25	11.59	CIN-173	1.91	1.80	8.02
CIN-148	0.90	1.23	3.17	CIN-174	2.96	3.14	10.78
CIN-149	0.00	3.70	3.33	CIN-175	5.28	5.50	16.01
CIN-150	3.75	2.23	8.09	CIN-176	3.63	4.17	9.62
CIN-151	1.53	1.12	6.26	CIN-177	3.21	2.80	4.03
CIN-152	2.95	2.06	10.26	CIN-178	2.10	1.73	3.98
CIN-153	3.93	5.10	13.48	CIN-179	2.83	4.21	15.73
CIN-154	1.08	1.89	4.51	CIN-180	4.37	5.35	5.88
CIN-155	2.57	6.77	8.24	CIN-181	4.30	2.97	15.07
CIN-156	1.41	1.64	5.10	CIN-182	3.46	5.06	8.68
CIN-158	3.38	5.70	12.44	CIN-183	2.08	6.63	5.73
CIN-159	3.84	6.45	3.28	CIN-184	5.02	3.80	3.44
CIN-160	5.42	3.76	6.05	CIN-185	5.14	3.08	12.89
CIN-161	3.05	4.89	7.16	CIN-186	3.05	4.34	4.30
CIN-166	2.02	2.39	14.54	JRC 517+	5.61	6.60	16.29
CIN-167	0.00	1.34	3.15	JRC 698+	5.68	7.05	17.96

YM=Yellow mite (no/cm² area from second unfold leaf); SL=Semilooper (% damage), BHC= Bihar Hairy Caterpillar (% damage)

Coochbehar: Among forty capsularis germplasm accessions, six accessions were moderately resistant (4-8%) against stem rot severity namely, CIN-138, CIN-148, CIN-154, CIN-167, CIN-171, CIN-172, CIN-173 and CIN-178. Among these accessions namely, CIN-136, CIN140, CIN-149, CIN-152, CIN-153, CIN-156, CIN-158, CIN-161, CIN-174 and CIN-175 were moderately susceptible towards stem rot (10-15%). Among the two checks, JRC 517 showed susceptible reaction against stem rot (22.64%), whereas, JRC 698 was moderately susceptible (14.93% stem rot severity). Highly susceptible germplasms (15-30%) towards stem rot were namely, CIN-151, CIN-179, CIN-167, CIN-176, CIN-177, CIN-179, CIN-182, CIN183, CIN-184, CIN-185and CIN-186. Root rot incidence was quite high in both the checks (29.41% and 17.12% in JRC 517 and JRC 698, respectively). Less root rot was observed in CIN-148, CIN-152, CIN-154, CIN-171, CIN-172, CIN-173and CIN-178. High root rot incidence was observed in CIN-139, CIN-151, CIN-155, CIN-167, CIN-177, CIN-179, CIN-181, CIN-182, CIN-183 and CIN-184 (table 3.12).

Table 3.11 Evaluation of *olitorius* jute germplasm against diseases at Coochbehar, West Bengal

Germplasm	Stem rot (PDI)	Root rot (%)	Germplasm	Stem rot (PDI)	Root rot (%)
	90 DAS	90DAS		90DAS	90DAS
OIN-140	11.64	13.89	OIN-166	14.77	13.13
OIN-141	11.39	18.13	OIN-167	16.79	20.98
OIN-142	5.12	6.23	OIN-168	8.25	7.34
OIN-143	10.29	15.43	OIN-171	13.31	16.46
OIN-146	12.38	11.83	OIN-172	13.69	13.43
OIN-147	4.89	5.34	OIN-173	18.54	18.45
OIN-148	8.36	10.68	OIN-174	14.93	8.87
OIN-149	7.34	8.23	OIN-175	14.25	18.16
OIN-150	19.87	20.97	OIN-176	13.75	17.34
OIN-151	14.23	16.48	OIN-177	12.23	16.39
OIN-152	10.45	15.63	OIN-178	9.13	10.47
OIN-153	17.34	20.23	OIN-179	10.12	15.38
OIN-154	17.25	12.32	OIN-180	10.23	10.29
OIN-159	13.45	18.63	OIN-181	5.78	8.98
OIN-160	12.38	18.89	OIN-182	15.23	12.72
OIN-161	11.26	13.34	OIN-183	13.96	14.36
OIN-162	15.69	10.96	OIN-184	10.13	9.35
OIN-163	15.39	17.42	OIN-185	10.43	10.36
OIN-164	16.27	20.36	JRO-524+	13.23	17.45
OIN-165	7.45	9.67	JRO204+	10.48	14.13

Table 3.12 Evaluation of *capsularis* jute germplasm against diseases at Coochbehar, West Bengal

Germplasms	Stem rot (PDI)	Root rot (%)	Germplasms	Stem rot (PDI)	Root rot (%)
	90 DAS	90 DAS		90 DAS	90 DAS
CIN-136	12.64	13.89	CIN-168	16.79	18.98
CIN-137	15.39	18.13	CIN-169	15.96	16.33
CIN-138	6.36	7.26	CIN-170	16.31	17.46
CIN-139	16.29	20.43	CIN-171	8.69	9.43
CIN-140	13.38	14.83	CIN-172	7.36	9.21
CIN-147	15.21	15.84	CIN-173	7.93	8.46
CIN-148	5.36	8.68	CIN-174	14.45	17.16
CIN-149	12.23	14.98	CIN-175	13.21	12.18
CIN-150	15.45	14.96	CIN-176	18.23	16.39
CIN-151	21.23	24.48	CIN-177	18.45	20.83
CIN-152	10.45	9.63	CIN-178	9.12	8.38
CIN-153	12.13	13.13	CIN-179	21.23	21.29
CIN-154	4.25	6.32	CIN-180	16.15	13.43
CIN-155	18.45	20.63	CIN-181	15.23	25.72
CIN-156	11.38	12.89	CIN-182	18.96	22.36
CIN-158	13.23	13.34	CIN-183	18.13	21.35
CIN-159	15.72	17.96	CIN-184	17.43	19.36
CIN-160	15.36	21.42	CIN-185	18.23	18.45
CIN-161	13.59	15.36	CIN-186	18.48	18.13
CIN-166	17.89	17.18	JRC517+	22.64	29.41
CIN-167	7.23	7.13	JRC698+	14.93	17.12

Katihar: Total fifty-two tossa jute germplasms including checks were evaluated against yellow mite, Bihar hairy caterpillar, semilooper and stem weevil. The infestation of yellow mite ranged from (5.63-27.45) number/cm^2, lowest infestation was observed in OIN-152, OIN-162, OIN-159, OIN-143 (5.63, 6.89, 8.37, 8.65, 7) mite/cm^2. The maximum yellow mite infestation found in JRO-524, JRO-204, OIN-181 OIN-165, (27.45, 26.29, 25.62, 25.41, 22.43). The infestation of BHC were ranged from (4.87– 30.47%). OIN-163 and OIN-161(4.87-4.89%) were least susceptible to BHC. The highest infestation of BHC found in OIN-179, JRO-204, OIN-167, OIN-178 (30.47, 30.42, 25.22, 24.35%). The semilooper infestation ranges from (12.52-32.25%). OIN-172 and OIN-136 showed least susceptibility against BHC. The stem weevil infestation ranges from (0.68-6.35%) (table 3.13).

Table 3.13 Screening of olitorius jute germplasm against insect pests at Katihar, Bihar

Germplasm	YM (No./ cm^2)	SW (%)	SL (%)	BHC (%)	Germplasm	YM (No./ cm^2)	SW (%)	SL (%)	BHC (%)
OIN- 136	20.38	1.69	12.69	8.47	OIN-162	6.89	2.38	20.62	12.41
OIN- 137	16.57	2.58	20.54	10.64	OIN-163	12.84	0.86	25.23	4.87
OIN- 138	18.21	3.12	22.31	12.49	OIN-164	15.82	0.94	22.32	8.39
OIN- 139	15.24	0.98	15.68	17.68	OIN-165	25.41	2.16	28.47	13.57
OIN- 140	12.47	0.89	20.17	13.35	OIN-166	22.68	3.24	15.89	22.47
OIN- 141	10.58	1.18	17.62	9.68	OIN-167	20.54	1.79	30.42	25.22
OIN- 142	15.29	1.74	16.89	5.89	OIN-168	17.26	0.76	16.58	20.37
OIN- 143	8.65	2.13	30.24	14.51	OIN-169	18.95	1.58	21.41	10.87
OIN- 144	9.32	2.52	21.48	12.68	OIN-170	12.69	2.88	17.67	11.79
OIN- 145	11.25	1.88	25.34	15.46	OIN-171	22.47	3.42	25.47	8.37
OIN- 146	14.78	0.68	18.62	13.56	OIN-172	15.87	3.74	12.52	20.49
OIN- 147	8.47	2.59	14.78	6.48	OIN-173	13.58	2.37	20.39	15.68
OIN- 148	12.62	3.47	26.48	12.47	OIN-174	18.64	0.92	27.43	8.71
OIN- 149	7.58	2.89	32.47	18.46	OIN-175	15.48	0.73	30.53	6.23
OIN- 150	15.68	3.84	18.76	15.62	OIN-176	20.36	1.18	14.95	9.62
OIN- 151	20.32	6.35	16.35	10.38	OIN-177	14.75	2.72	20.46	10.47
OIN- 152	5.63	4.52	22.42	8.29	OIN-178	11.88	3.69	18.46	24.35
OIN- 153	9.41	0.71	20.78	6.21	OIN-179	13.65	5.31	22.24	30.47
OIN- 154	10.28	1.72	18.34	10.47	OIN-180	15.59	5.78	17.87	20.38
OIN- 155	22.15	1.63	15.62	17.59	OIN-181	25.62	4.48	23.26	8.68
OIN- 156	12.49	3.62	22.33	7.69	OIN-182	17.42	0.71	28.27	7.87
OIN- 157	10.51	5.12	17.25	16.49	OIN-183	24.61	0.78	19.68	14.53
OIN- 158	9.61	2.87	25.64	22.12	OIN-184	21.42	5.42	22.31	22.68
OIN- 159	8.37	1.93	23.69	18.62	OIN-185	15.36	4.56	24.29	24.37
OIN- 160	15.59	3.14	30.48	15.32	JRO-524	27.45	5.37	32.25	20.69
OIN- 161	12.78	4.21	15.49	4.89	JRO-204	26.29	4.95	30.34	30.42

Katihar: The total fifty-two capsularis jute germplasms including checks were evaluated against yellow mite, Bihar hairy caterpillar, semilooper and stem weevil. The infestation of yellow mite ranged from (7.88-32.27) number/cm^2, lowest infestation observed in CIN-154, CIN-166, CIN-167, CIN-138, and CIN-153 (7.88, 7.89, 8.27, 8.38, 8.58). The highest infestation of BHC was found in CIN-179 (38.65%) followed by CIN-175 (36.45%)

and CIN-181 (35.24%) the germplasms having lowest infestation (1.24-1.54%) of BHC were CIN-145, CIN-146. The semilooper infestation ranges from (10.78-42.56%), CIN-171 and CIN-136 had lowest plant damage (10.78-12.54%). The stem weevil infestation ranges from (0.25-6.34%) CIN-145 was least susceptible although few other lines also had <1 % damage (table 3.14).

Table 3.14 Screening of *capsularis* jute germplasm against insect pests at Katihar, Bihar

Germplasm	YM (No./ cm²)	SW (%)	SL (%)	BHC (%)	Germplasm	YM (No./ cm²)	SW (%)	SL (%)	BHC (%)
CIN- 136	15.68	0.86	12.54	5.84	CIN-163	18.62	4.52	25.38	9.35
CIN-137	12.54	0.93	15.68	12.52	CIN-164	21.32	1.94	38.41	10.42
CIN- 138	8.38	1.54	30.28	20.36	CIN-165	8.96	3.69	15.42	15.42
CIN-139	19.74	2.58	36.52	14.57	CIN-166	7.89	3.87	30.32	28.65
CIN-140	15.25	0.87	28.75	10.25	CIN-167	8.27	4.12	26.58	25.58
CIN-141	10.69	5.45	32.46	12.34	CIN-168	12.59	5.27	25.64	12.27
CIN-142	20.64	3.22	20.59	20.26	CIN-169	18.42	3.58	38.46	10.23
CIN-143	18.35	1.28	25.78	25.32	CIN-170	16.32	3.93	12.52	10.45
CIN-144	16.52	1.35	38.62	35.15	CIN-171	10.47	4.57	10.78	8.54
CIN-145	12.48	0.25	35.47	1.24	CIN-172	12.32	3.87	37.19	23.57
CIN-146	18.26	0.32	22.48	1.54	CIN-173	17.39	5.23	35.79	30.62
CIN-147	12.37	2.87	18.68	20.21	CIN-174	11.58	5.56	40.62	22.16
CIN-148	15.42	4.85	19.85	18.74	CIN-175	18.27	3.16	27.64	36.47
CIN-149	9.21	5.23	20.48	30.32	CIN-176	27.46	5.17	36.28	15.42
CIN-150	15.89	1.82	32.45	35.16	CIN-177	15.87	2.58	28.92	18.65
CIN-151	10.23	1.22	15.86	12.47	CIN-178	24.59	5.48	40.57	12.56
CIN-152	9.63	0.97	33.26	20.48	CIN-179	15.68	4.87	32.15	38.47
CIN-153	8.58	5.36	20.45	13.56	CIN-180	31.54	5.24	42.16	32.52
CIN-154	7.88	2.48	12.78	22.16	CIN-181	32.27	3.49	32.47	35.24
CIN-155	15.48	3.87	41.12	28.23	CIN-182	18.43	1.89	30.68	20.78
CIN-156	8.89	1.75	16.52	18.78	CIN-183	12.58	1.58	24.87	18.75
CIN-158	12.56	5.14	15.26	10.34	CIN-184	18.19	2.32	36.21	12.49
CIN-159	12.34	1.83	32.47	32.62	CIN-185	22.18	4.48	42.56	20.75
CIN-160	25.34	5.67	20.58	5.87	CIN-186	15.24	2.34	23.58	11.54
CIN-161	9.51	3.72	17.84	20.47	JRC-517	28.59	5.46	40.41	32.68
CIN-162	8.78	5.32	20.49	22.58	JRC-698	28.64	6.34	42.32	35.78

Katihar: Out of 52 lines of *tossa* jute (*C. olitorious*) evaluated against stem rot, and root rot, the incidence of root rot was recorded after 65 days and disease incidence was very low and varied from 0 to 3.95%. The incidence of most of the stem rot affected lines was below 5%. The highest stem rot disease incidence (4.91 %) was recorded in OIN-178 followed by 4.17 % in OIN-177 in comparison to no incidence in check variety, JR0-204. Total 38 lines showed immune reaction to stem rot and 41 lines to root rot disease incidence under field condition (table 3.15).

Table 3.15 Screening of *olitorius* jute germplasm against diseases at Katihar, Bihar

Germplasm	RR (DI %)	SR (PDI)	Germplasm	RR (DI %)	SR (PDI)
OIN- 136	0.00	0.00	OIN-162	0.00	3.45
OIN -137	0.00	0.00	OIN-163	1.10	0.00
OIN- 138	0.00	0.00	OIN-164	1.85	0.00
OIN-139	0.00	1.62	OIN-165	0.00	0.00
OIN-140	0.00	0.00	OIN-166	0.00	0.00
OIN-141	0.00	0.00	OIN-167	0.00	0.00
OIN-142	0.00	0.00	OIN-168	1.51	0.00
OIN-143	0.00	0.00	OIN-169	0.00	0.95
OIN-144	0.00	1.88	OIN-170	0.00	0.00
OIN-145	0.00	0.00	OIN-171	0.00	0.00
OIN-146	0.00	1.04	OIN-172	0.00	0.00
OIN-147	0.00	0.00	OIN-173	2.84	0.00
OIN-148	0.00	0.00	OIN-174	0.00	0.00
OIN-149	0.00	2.14	OIN-175	0.00	0.00
OIN-150	2.58	3.24	OIN-176	0.00	0.00
OIN -151	3.95	0.00	OIN-177	0.00	4.17
OIN-152	3.75	0.00	OIN-178	0.00	4.91
OIN-153	3.20	0.00	OIN-179	0.00	0.00
OIN-154	2.19	0.00	OIN-180	0.00	0.00
OIN-155	0.00	4.00	OIN-181	0.00	0.00
OIN-156	0.00	1.57	OIN-182	0.00	0.00
OIN-157	0.00	3.39	OIN-183	1.68	0.00
OIN-158	0.00	0.00	OIN-184	0.00	2.17
OIN-159	2.22	0.00	OIN-185	0.00	0.00
OIN-160	0.00	0.00	JRO-524	0.00	0.00
OIN-161	0.00	0.00	JRO-204	0.00	0.00

Katihar: Total 52 lines of white jute (*C. capsularis*) evaluated against stem rot, root rot and mosaic, after 65 days and it was found that the incidence of root rot and stem rot was very low. The stem rot disease PDI was 0 in almost all the germplasm lines. The root rot incidence was recorded highest in CIN-138 (3.98), CIN-156 followed by CIN-155. The low to high incidence of mosaic was reported, that varies from 0to 23.97 %. The line CIN-185 was most susceptible with 23.97 while CIN-176, CIN-177, CIN-170, CIN-172, CIN-165, CIN-161, CIN-159, CIN-155, CIN-156, CIN-147, CIN-151, CIN-152 and CIN-153 line showed no mosaic infestation (table 3.16).

Table 3.16 Screening of *capsularis* jute against diseases at Katihar, Bihar

Germplasm	RR (DI %)	SR (PDI)	Mosaic (%)	Germplasm	RR (DI %)	SR (PDI)	Mosaic (%)
CIN- 136	0.00	0.00	15.21	CIN-163	0.00	0.00	9.03
CIN-137	0.00	0.00	11.53	CIN-164	0.00	0.00	7.36
CIN- 138	3.98	0.00	19.66	CIN-165	0.00	0.00	0.00
CIN-139	0.00	1.15	23.01	CIN-166	0.00	0.00	11.60
CIN-140	0.00	0.00	11.15	CIN-167	0.00	0.00	13.64
CIN-141	0.00	0.00	5.83	CIN-168	0.00	0.00	11.79
CIN-142	0.00	0.00	16.49	CIN-169	0.00	0.00	7.12
CIN-143	0.00	0.00	8.69	CIN-170	0.00	0.00	0.00
CIN-144	0.00	0.00	2.52	CIN-171	0.00	0.00	1.15
CIN-145	0.00	0.00	7.15	CIN-172	0.00	0.00	0.00
CIN-146	0.00	0.00	18.77	CIN-173	0.00	0.00	4.26
CIN-147	0.00	0.00	0.00	CIN-174	0.00	0.00	17.41
CIN-148	0.00	0.00	11.05	CIN-175	0.00	0.00	5.33
CIN-149	0.00	0.00	13.57	CIN-176	0.00	0.00	0.00
CIN-150	0.00	0.73	1.89	CIN-177	0.00	0.00	0.00
CIN -151	0.00	0.82	0.00	CIN-178	0.00	0.83	5.38
CIN-152	0.00	0.00	0.00	CIN-179	0.00	0.00	7.01
CIN-153	0.00	0.00	0.00	CIN-180	0.00	0.00	18.48
CIN-154	0.00	0.00	4.94	CIN-181	0.00	0.00	7.64
CIN-155	3.40	0.00	0.00	CIN-182	0.00	0.00	13.96
CIN-156	3.82	0.00	0.00	CIN-183	0.00	0.00	12.31
CIN-158	0.00	0.00	3.68	CIN-184	0.00	0.00	8.71
CIN-159	0.00	0.00	0.00	CIN-185	0.00	0.00	23.97
CIN-160	0.00	0.00	6.51	CIN-186	0.00	0.00	12.99
CIN-161	0.00	1.15	0.00	JRC-517	1.69	0.62	0.00
CIN-162	0.00	0.00	5.40	JRC-698	0.00	0.00	0.00

Kendrapara: The stem rot percent disease index (PDI) varied from 0 to 18.11 (table 3.17). The germplasm free from stem rot disease were OIN-158, OIN-160 and OIN-168.The lowest PDI (1.08) was recorded in germplasm OIN-173., whereas highest PDI (18.11) was recorded in JRO-524, which indicates that germplasm OIN-173 is resistant to stem rot and JRO-524 is highly susceptible to stem rot. Nine germplasms were found to be moderately resistant to stem rot having PDI ranges from 1.08 to 4.29.Twenty two germplasms having PDI 5 TO 10 were moderately susceptible to stem rot disease. Ten germplasms having PDI more than 10 are susceptible to stem rot disease. The insect pest which attack the *tossa* jute were yellow mite, stem weevil & semilooper. Range of yellow mite infestation was 2 to 13.62%.The minimum infestation of mite was found in OIN-138(2%) and maximum infestation was found in JRO-524 (13.62%). Stem weevil infestation ranges from 1.11 % to 7.21% .Minimum infestation was found in OIN-167(1.11%) and maximum infestation of stem weevil was found in OIN-156 (7.21%). Semilooper infestation ranges from 1.31 % to 13.45%. Maximum semilooper infestation was found in OIN-170 (13.45%) and minimum infestation was found in OIN-138 (1.31%) (table 3.17).

Table 3.17 Evaluation of *olitorius* jute germplasm against insect pests and diseases at Kendrapara, Odisha

Germplasms	Yellow mite plant damage%	Stem weevil damage %	Semilooper damage %	Stem rot PDI
OIN-136	6.23	2.2	3.12	9.87
OIN-137	10.18	4.22	8.13	12.18
OIN-138	2.0	3.12	1.31	10.97
OIN-139	7.67	2.88	7.20	18.46
OIN-140	9.20	5.45	10.00	9.90
OIN-141	2.32	1.34	9.12	14.98
OIN-142	Not germinated			
OIN-143	3.57	2.18	2.12	8.61
OIN-144	5.62	2.00	12.00	9.36
OIN-145	7.93	2.22	7.11	5.58
OIN-146	Not germinated			
OIN-147	9.78	4.88	7.76	7.07
OIN-148	8.38	3.53	9.44	11.84
OIN-149	Not germinated			
OIN-150	Not germinated			
OIN-151	3.00	2.52	4.65	0.00
OIN-152	6.72	4.54	7.22	11.74
OIN-153	9.76	3.58	8.82	2.59
OIN-154	10.73	3.85	8.84	3.57
OIN-155	8.55	6.98	11.32	12.18
OIN-156	11.23	7.21	8.39	7.94
OIN-157	3.65	3.42	2.71	7.58
OIN-158	5.29	3.25	4.58	0.00
OIN-159	Not germinated			
OIN-160	10.32	5.82	10.53	0.00
OIN-161	3.49	4.44	8.83	6.66
OIN-162	6.22	2.76	1.43	5.57
OIN-163	3.66	1.65	2.78	5.76
OIN-164	5.53	2.32	3.98	4.29
OIN-165	Not germinated			
OIN-166	11.87	3.23	7.83	2.43
OIN-167	2.32	1.11	2.20	2.62
OIN-168	10.34	2.52	6.92	0.00
OIN-169	12.62	3.87	9.98	1.98
OIN-170	11.22	5.76	13.45	2.40
OIN-171	9.34	5.47	12.33	6.48
OIN-172	11.52	5.44	10.51	7.20
OIN-173	1.00	1.32	2.24	1.08
OIN-174	6.87	1.45	3.57	7.12

Germplasms	Yellow mite plant damage%	Stem weevil damage %	Semilooper damage %	Stem rot PDI
OIN-175	12.22	5.42	12.32	5.86
OIN-176	8.32	3.46	5.57	8.87
OIN-177	3.98	1.57	2.53	9.15
OIN-178	6.34	1.48	3.98	7.74
OIN-179	5.97	2.59	8.97	7.50
OIN-180	9.33	3.91	7.52	8.62
OIN-181	2.33	2.74	4.32	8.64
OIN-182	6.66	4.71	5.73	11.01
OIN-183	2.36	2.73	2.54	6.18
OIN-184	9.12	4.47	8.85	12.48
OIN-185	8.46	5.54	6.67	3.41
JRO 524+	13.62	5.12	9.53	18.11
JRO 204+	5.43	3.42	6.23	7.61

+: check variety

Kendrapara: In white jute, the incidence of stem rot and mosaic disease were recorded. The stem rot percent disease index (PDI) varies from 3.94 to 23.48**.** The lowest PDI (3.94) was recorded in germplasm, CIN-154 whereas highest PDI (23.48) was in JRC-698, which indicated that CIN-154 was moderately resistant to stem rot and JRC-698 was highly susceptible to stem rot. The other germplasm which were moderately resistant to stem rot was CIN-139 (PDI-139). Twenty six germplasm having PDI 5 to 10 were moderately susceptible to stem rot disease. Mosaic disease was exclusively recorded in white jute germplasm with range of 0% to 14.44%. The germplasm free from mosaic disease were CIN-142,CIN-158,CIN-158,CIN-161, CIN-167, CIN-169, CIN-171, CIN-173, CIN-183, CIN-185, JRC-517 and JRC-698.The insect pest attack the white jute were yellow mite, stem weevil & semilooper. Major insect pest which infest the white jute were yellow mite, stem weevil & semilooper. Range of yellow mite infestation was 1.12 to 12.65.The minimum infestation of mite was found in CIN-148 (1.12%) and maximum infestation was found in JRC-698 (12.65%). Stem weevil infestation ranges from 1.23% to 7.85% .Minimum infestation was found in CIN-148 (1.23%) and maximum infestation of stem weevil found in CIN-143 (7.85%). The germplasm, CIN-164 and CIN-167 were free from Stem weevil attack. Semilooper infestation ranges from 0.00 % to 11.24%. Maximum semilooper infestation was found in JRC-698 (11.24%) and minimum infestation was found in (CIN-165 (2.20%) whereas CIN-163 and CIN-167 were free from semilooper damage (table 3.18).

Table 3.18 Evaluation of *capsularis* jute germplasm against insect pests and diseases at Kendrapara, Odisha

Germplasm	Yellow mite plant damage %	Stem weevil plant damage %	Semilooper plant damage %	Stem rot PDI	Mosaic disease %
CIN-136	3.42	3.82	5.87	5.45	15.15
CIN-137	6.30	3.76	6.76	7.65	12.73
CIN-138	7.30	4.89	5.83	6.36	18.79
CIN-139	6.30	4.65	4.78	4.70	0.00
CIN-140	3.30	2.20	6.35	6.52	10.91
CIN-141	4.32	4.76	5.37	5.80	13.94
CIN-142	9.85	6.76	8.43	7.05	0.00

Germplasm	Yellow mite plant damage %	Stem weevil plant damage %	Semilooper plant damage %	Stem rot PDI	Mosaic disease %
CIN-143	8.93	7.85	9.74	9.85	11.52
CIN-144	3.54	7.45	8.34	6.10	12.12
CIN-145	3.76	2.69	6.72	10.53	10.30
CIN-146	4.76	5.28	5.45	9.02	7.27
CIN-147	8.32	6.92	6.34	9.58	13.33
CIN-148	1.12	1.23	2.32	7.35	14.55
CIN-149	2.45	2.41	9.38	6.44	4.24
CIN-150	3.32	2.32	3.42	12.46	4.85
CIN-151	4.14	2.62	8.30	8.03	13.94
CIN-152	Not germinated				
CIN-153	8.31	3.87	5.52	11.21	12.73
CIN-154	7.65	5.84	8.82	3.94	8.48
CIN-155	4.86	4.43	7.67	11.67	4.85
CIN-156	3.82	4.54	8.97	10.83	6.67
CIN-158	7.87	6.70	9.58	9.09	0.00
CIN-159	10.63	4.90	12.67	12.20	4.85
CIN-160	11.12	3.60	8.45	10.61	4.24
CIN-161	10.59	7.60	8.87	11.67	0.00
CIN-162	1.25	1.28	2.62	8.03	7.88
CIN-163	3.73	1.34	0.00	7.65	8.48
CIN-164	6.20	0.00	1.86	10.00	6.06
CIN-165	3.43	2.29	2.20	7.16	4.85
CIN-166	1.20	3.29	3.55	9.09	4.24
CIN-167	2.20	0.00	0.00	12.46	0.00
CIN-168	5.48	2.34	4.54	12.12	4.85
CIN-169	5.56	2.43	3.48	8.37	0.00
CIN-170	6.64	5.55	10.32	9.47	7.27
CIN-171	1.30	2.57	2.21	8.94	0.00
CIN-172	8.45	6.56	5.54	7.61	7.27
CIN-173	3.49	5.68	4.73	10.15	0.00
CIN-174	6.55	4.84	4.56	13.67	3.64
CIN-175	12.32	5.86	7.46	13.18	7.27
CIN-176	6.75	5.42	7.33	10.91	12.12
CIN-177	6.43	6.72	4.53	9.47	7.27
CIN-178	6.45	4.32	5.28	8.41	6.67
CIN-179	3.32	3.45	6.85	11.89	5.45
CIN-180	5.83	3.57	3.44	10.15	7.88
CIN-181	6.75	4.67	8.99	15.08	12.73
CIN-182	7.65	3.42	7.68	12.05	5.45
CIN-183	5.43	4.57	11.20	14.05	0.00

Germplasm	Yellow mite plant damage %	Stem weevil plant damage %	Semilooper plant damage %	Stem rot PDI	Mosaic disease %
CIN-184	8.45	5.67	9.56	11.82	6.67
CIN-185	7.84	4.86	8.45	11.06	0.00
CIN-186	7.34	5.47	7.20	10.38	7.88
JRC 517+	8.34	4.67	7.52	19.96	0.00
JRC 698+	12.65	6.84	11.24	23.48	0.00

+: check variety

NP(ME) 4.5: Evaluation of mesta germplasm against pests and diseases

The project was allotted to Amadalavalasa, Katihar and Coochbehar centres and the centre-wise data are presented below:

Katihar: Out of 50 lines of mesta evaluated against foot and stem rot, and mosaic, the incidence of foot and stem rot was very low and varied from 0 to 4.62%. The highest percentage of diseases was recorded in germplasm line KIN-185 followed by KIN-208. Total 26 lines were not infected with foot and stem rot. Most of the mesta germplasm were mosaic infected but disease incidence was below 10%. High mosaic infection was recorded in KIN-180 (11.79) while low infection was recorded in KIN-215(0.95) followed by KIN-193 (table 3.19).

Table 3.19 Evaluation of mesta germplasm against diseases at Katihar, Bihar

Germplasm	Foot and Stem rot (DI %)	Mosaic (%)	Germplasm	Foot and Stem rot (DI %)	Mosaic (%)
KIN-178	0.00	7.36	KIN-206	0.00	7.25
KIN-180	0.00	11.79	KIN-207	3.89	6.08
KIN-181	1.19	6.12	KIN-208	4.62	9.90
KIN-182	1.94	8.10	KIN-209	3.36	5.88
KIN-183	2.71	4.71	KIN-210	0.95	6.68
KIN-184	3.88	5.01	KIN-211	3.88	3.47
KIN-185	4.69	7.01	KIN-212	1.76	5.19
KIN-186	0.00	7.00	KIN-213	3.79	5.63
KIN-187	2.27	6.39	KIN-214	2.02	7.88
KIN-188	0.00	6.38	KIN-215	0.00	0.95
KIN-189	0.00	5.45	KIN-216	3.41	3.27
KIN-190	3.52	5.50	KIN-217	0.00	5.53
KIN-191	0.00	6.36	KIN-218	1.11	6.40
KIN-192	0.00	7.48	KIN-220	0.00	5.10
KIN-193	0.00	1.75	KIN-221	0.00	2.61
KIN-194	0.00	5.27	KIN-222	1.86	5.86
KIN-195	0.00	8.40	KIN-223	0.00	3.69
KIN-196	0.00	4.53	KIN-224	0.00	5.12
KIN-197	1.93	5.05	KIN-225	0.95	2.84
KIN-198	0.00	7.82	KIN-226	1.04	2.89
KIN-199	2.27	3.60	KIN-227	1.78	2.76

Germplasm	Foot and Stem rot (DI %)	Mosaic (%)	Germplasm	Foot and Stem rot (DI %)	Mosaic (%)
KIN-200	2.81	4.58	KIN-228	0.00	7.52
KIN-202	3.54	4.60	KIN-229	0.00	9.48
KIN-203	0.00	3.22	KIN-230	0.00	5.50
KIN-204	0.00	9.53	HC583+	0.85	4.80
KIN-205	0.00	2.87	AMC108+	0.00	4.61

Katihar: The total fifty-two germplasms of *(H. cannabinus*) (Kenaf) were evaluated against different insect pests. The observations were recorded weekly interval on leafhopper and whitefly population. The population of leafhopper ranged from (1.32 – 4.68) 45 DAS, (2.49 – 7.58) 52 DAS, and (3.25 – 8.12) 59 DAS per/plant. In case of white flies population ranged from (0.46 – 4.86) 45 DAS, (1.34 – 8.34) 52 DAS, and (2.85 – 9.16) 59 DAS per/plant (table 3.20).

Table 3.20 Evaluation of mesta germplasm against insect pests at Katihar, Bihar

Germplasm	45 DAS		52 DAS		59 DAS		Germplasm	45 DAS		52 DAS		59 DAS	
	LH	WF	LH	WF	LF	WF		LF	WF	LH	WF	LF	WF
	(no./plant)		(no./plant)		(no./plant)			(no./plant)		(no./plant)		(no./plant)	
KIN-179	2.12	1.54	5.63	6.25	3.56	4.58	KIN-206	3.66	4.24	5.67	7.25	7.36	5.85
KIN-180	3.22	1.83	4.57	5.52	5.48	2.85	KIN-207	1.76	4.44	3.16	8.34	3.94	8.86
KIN-181	1.86	1.73	3.28	3.84	7.35	7.32	KIN-208	2.65	4.68	4.64	5.37	4.14	5.96
KIN-182	1.97	2.54	6.58	7.24	5.46	5.86	KIN-209	2.89	3.86	5.24	6.28	4.36	7.12
KIN-183	2.58	2.87	2.84	3.58	4.78	6.58	KIN-210	4.54	4.66	6.54	6.29	5.28	7.24
KIN-184	2.65	4.25	4.56	2.87	6.49	3.69	KIN-211	3.65	2.46	5.87	4.64	3.42	5.36
KIN-185	3.21	1.78	5.65	6.39	7.38	4.57	KIN-212	1.65	2.24	3.58	5.26	4.12	6.42
KIN-186	1.89	4.35	3.85	5.45	5.41	7.18	KIN-213	1.42	3.46	2.86	6.34	4.24	6.87
KIN-187	2.74	3.48	6.23	1.89	3.87	5.64	KIN-214	1.86	2.86	3.27	3.89	5.78	4.12
KIN-188	4.18	1.84	2.84	2.57	6.39	3.58	KIN-215	2.65	4.86	4.64	4.26	6.43	5.22
KIN-189	3.41	1.79	4.32	3.74	3.89	7.22	KIN-216	2.45	4.64	5.27	5.24	7.45	4.68
KIN-190	1.78	2.69	3.64	4.23	5.87	3.75	KIN-217	3.45	3.62	6.45	5.86	6.24	5.24
KIN-191	1.36	2.69	5.17	5.38	7.32	6.64	KIN-218	4.68	3.86	7.58	6.14	8.12	7.42
KIN-192	1.82	2.75	3.83	2.49	4.56	4.25	KIN-220	4.54	3.22	7.46	7.24	4.56	8.46
KIN-193	2.52	3.68	2.89	3.46	6.21	6.28	KIN-221	1.82	4.62	2.49	3.78	6.14	4.28
KIN-194	2.22	0.86	3.21	1.34	3.74	2.46	KIN-222	1.34	2.68	3.27	4.56	5.22	5.16
KIN-195	1.32	0.46	4.32	2.46	5.23	3.26	KIN-223	1.45	2.82	2.86	5.16	3.67	5.74
KIN-196	1.56	0.86	2.78	2.58	3.28	3.78	KIN-224	2.56	3.86	4.56	7.24	6.48	6.96
KIN-197	2.11	0.64	5.43	2.24	6.56	4.12	KIN-225	1.65	4.64	3.22	8.34	4.78	9.16
KIN-198	3.22	0.76	6.24	2.12	5.32	3.56	KIN-226	1.76	3.26	4.46	5.46	6.25	5.94
KIN-199	2.45	1.44	3.46	3.56	5.27	5.24	KIN-227	3.32	2.98	6.67	4.87	7.57	3.98
KIN-200	1.56	2.46	2.67	5.24	3.25	6.56	KIN-228	1.86	3.84	4.12	5.51	5.46	6.28
KIN-202	1.43	3.68	3.12	6.87	4.46	7.48	KIN-229	1.54	2.46	2.94	4.69	3.48	5.27
KIN-203	3.23	4.68	5.34	7.45	6.16	8.28	KIN-230	2.34	2.24	5.14	4.96	4.13	5.44
KIN-204	2.48	2.86	3.67	4.76	3.89	5.29	HC 583+	3.43	3.46	5.34	5.26	6.34	5.36
KIN-205	1.67	2.64	2.87	5.28	3.64	6.86	AMC 108+	2.56	3.84	4.62	4.82	5.86	4.76

Amadalavalasa: Among the *Hibiscus sabdariffa* (Roselle) germplasm screened against insect pests, aphid incidence was low in all the entries and ranging from 0.00 to 10.56 aphids per plant with highest incidence was recorded in RIN-64 entry. There was no whitefly incidence in RIN-66 and RIN-100 when compared to higher incidence of 0.52 whiteflies per plant was observed in RIN-103 entry. Similarly RIN-71 entry free from leafhopper infestation whereas higher population of 0.92 leafhoppers per plant was recorded in RIN-96 entry. Leaf damage by semilooper was low in RIN-73 (3.32 % leaf damage) and check entry, AMV-5+ (4.47% leaf damage) as against highest leaf damage of 19.32 % was observed in RIN-89 entry. RIN-90, RIN-114 and RIN-117 entries recorded low mealybug incidence with % incidence of 2.11, 2.63 and 2.59, respectively compared to higher incidence in RIN-70 entry (18.07%) (table 3.21).

Disease incidence in mesta crop at Amadalavalasa

Table 3.21 Incidence of insect pests on different entries of mesta (roselle) screened under field conditions at Amadalavalasa, Andhra Pradesh

Germplasm	*Cumulative incidence of insect pests				
	Aphids (no./plant)	Whiteflies (no./plant)	Leafhoppers (no./plant)	Semilooper Damage (%)	Mealybug infestation (%)
RIN-64	9.52	0.04	0.20	12.67	3.56
RIN-66	6.12	0.00	0.16	10.65	7.30
RIN-67	10.56	0.12	0.16	16.65	4.80
RIN-68	3.64	0.08	0.08	11.99	5.69
RIN-69	1.28	0.36	0.16	9.73	8.06
RIN-70	8.04	0.24	0.04	9.33	18.07
RIN-71	2.56	0.12	0.00	5.99	5.94
RIN-72	0.68	0.08	0.40	13.33	7.00
RIN-73	5.68	0.08	0.32	3.32	13.31
RIN-74	1.28	0.16	0.28	5.97	5.68
RIN-75	0.88	0.16	0.36	11.31	4.86
RIN-76	2.40	0.48	0.20	9.32	6.12
RIN-77	8.56	0.08	0.08	6.65	7.99
RIN-78	1.20	0.12	0.20	7.99	5.60
RIN-79	9.48	0.08	0.08	10.65	4.51
RIN-80	1.44	0.08	0.32	6.67	14.40
RIN-81	3.28	0.20	0.24	7.31	5.77
RIN-82	2.16	0.20	0.32	8.67	4.35
RIN-83	2.32	0.24	0.24	11.99	12.42
RIN-84	1.80	0.16	0.36	12.65	3.69
RIN-85	0.00	0.20	0.24	15.33	5.53
RIN-87	3.48	0.24	0.16	6.67	6.23
RIN-88	0.32	0.48	0.04	10.65	5.59

Germplasm	*Cumulative incidence of insect pests				
	Aphids (no./plant)	Whiteflies (no./plant)	Leafhoppers (no./plant)	Semilooper Damage (%)	Mealybug infestation (%)
RIN-89	0.68	0.40	0.12	19.32	4.37
RIN-90	1.36	0.36	0.44	12.65	2.11
RIN-91	1.28	0.16	0.64	12.73	5.00
RIN-92	0.76	0.08	0.36	11.99	3.74
RIN-93	0.96	0.12	0.36	10.53	5.18
RIN-94	5.16	0.16	0.20	8.19	4.30
RIN-95	Germination failed completely				
RIN-96	1.00	0.32	0.92	6.65	6.09
RIN-98	1.40	0.12	0.08	5.32	7.75
RIN-99	2.12	0.17	0.36	19.31	6.67
RIN-100	7.24	0.00	0.12	12.69	5.06
RIN-101	1.56	0.20	0.08	19.98	5.70
RIN-102	4.40	0.08	0.44	6.65	6.41
RIN-103	3.84	0.52	0.24	11.99	4.89
RIN-105	0.96	0.24	0.36	11.32	4.26
RIN-106	2.60	0.40	0.36	14.00	9.77
RIN-107	1.24	0.48	0.08	13.31	7.05
RIN-108	0.00	0.12	0.04	11.33	8.00
RIN-109	2.20	0.12	0.28	8.65	5.00
RIN-111	1.40	0.16	0.28	7.99	5.17
RIN-112	6.48	0.16	0.40	7.99	5.41
RIN-113	1.08	0.16	0.20	11.98	3.85
RIN-114	0.20	0.44	0.28	5.98	2.63
RIN-115	0.88	0.44	0.12	13.31	3.03
RIN-117	0.36	0.16	0.08	14.64	2.59
RIN-118	1.16	0.24	0.20	10.00	3.62
HS 4288+	2.52	0.24	0.20	5.20	3.60
AMV 5+	6.24	0.12	0.12	4.47	5.25

+: Check variety; *: Mean data of insect pests recorded at 30, 45, 60, 75 & 90 DAS

Amadalavalasa: Among the *Hibiscus cannabinus* (kenaf) germplasm screened against insect pests, the incidence of aphids ranged from 0.00 to 10.68 aphids per plant among different germplasm with highest incidence was recorded in KIN-179 entry. Whiteflies were completely absent in KIN-198, KIN-207 and KIN-221germplasm compared to higher incidence of 0.48 whiteflies per plant was recorded in KIN-193 entry. The germplasm KIN-180, KIN-207 and KIN-212 recorded lower population of leafhoppers (0.08, 0.08 and 0.04 no. per plant) when compared to highest population of 0.68 no. per plant was recorded in KIN-230 entry. The % leaf damage by the semilooper in different germplasm was ranged from 2.67 to 22.66, however less than 5 % leaf damage was recorded in KIN-179 (4.65), KIN-180 (4.67 and KIN-181 (2.67) germplasm. Mealybug incidence in different germplasm ranged from 3.54 to 16.93 % with less than 4 % incidence was observed in KIN-205 (3.80 %), KIN-211(3.54%) germplasm and check variety HC-583 (3.99%) (table 3.22).

Table 3.22 Incidence of insect pests on different germplasm of kenaf screened under field conditions at Amadalavalasa, Andhra Pradesh

Name of the germplasm	*Cumulative incidence of insect pests				
	Aphids (no./plant)	Whiteflies (no./plant)	Leafhoppers (no./plant)	Semilooper Damage (%)	Mealybug infestation (%)
KIN-179	10.68	0.08	0.16	4.65	8.29
KIN-180	4.04	0.04	0.08	4.67	10.55
KIN-181	3.00	0.12	0.12	2.67	8.83
KIN-182	2.24	0.24	0.16	8.66	11.90
KIN-183	0.48	0.32	0.20	6.66	10.80
KIN-184	0.00	0.20	0.20	6.66	10.49
KIN-185	0.00	0.20	0.60	11.99	16.93
KIN-186	0.00	0.40	0.24	6.66	8.71
KIN -187	0.00	0.40	0.08	11.99	9.24
KIN -188	0.00	0.36	0.32	5.33	10.41
KIN-189	0.00	0.20	0.24	9.33	7.16
KIN-190	0.20	0.20	0.40	13.99	5.51
KIN-191	0.28	0.12	0.40	22.66	8.03
KIN-192	0.20	0.20	0.80	6.67	13.76
KIN-193	0.00	0.48	0.56	13.33	5.86
KIN-194	0.00	0.16	0.52	14.00	11.72
KIN-195	0.60	0.32	0.28	12.66	6.40
KIN-196	0.00	0.16	0.28	16.00	8.03
KIN-197	0.00	0.04	0.40	14.67	6.53
KIN-198	1.36	0.00	0.28	22.00	6.58
KIN-199	0.64	0.08	0.16	15.34	6.04
KIN-200	0.72	0.12	0.36	17.32	5.37
KIN-202	0.00	0.20	0.32	12.66	8.68
KIN-203	0.00	0.16	0.20	9.32	5.08
KIN-204	0.00	0.08	0.28	7.33	5.06
KIN-205	3.08	0.16	0.28	11.33	3.80
KIN-206	0.28	0.08	0.40	8.00	6.94
KIN-207	0.92	0.00	0.08	10.65	4.54
KIN-208	2.60	0.04	0.24	10.00	5.41
KIN-209	0.32	0.08	0.16	6.66	7.38
KIN-210	2.60	0.04	0.32	12.00	8.09
KIN-211	0.92	0.08	0.28	10.66	3.54
KIN-212	0.68	0.08	0.04	12.00	5.06
KIN-213	0.64	0.08	0.60	9.32	4.76
KIN-214	0.00	0.20	0.32	6.67	7.55
KIN-215	1.28	0.24	0.28	7.33	5.03

Name of the germplasm	*Cumulative incidence of insect pests				
	Aphids (no./plant)	Whiteflies (no./plant)	Leafhoppers (no./plant)	Semilooper Damage (%)	Mealybug infestation (%)
KIN-216	5.48	0.12	0.32	12.00	5.53
KIN-217	0.08	0.16	0.48	11.33	7.75
KIN-218	0.24	0.16	0.32	7.99	7.04
KIN-220	3.80	0.08	0.48	13.32	6.85
KIN-221	1.24	0.00	0.40	15.32	4.89
KIN-222	1.04	0.12	0.48	14.67	5.03
KIN-223	2.44	0.20	0.36	15.99	4.99
KIN-224	3.00	0.08	0.24	10.67	5.32
KIN-225	3.48	0.04	0.40	17.33	4.47
KIN-226	0.68	0.12	0.44	10.00	6.29
KIN-227	0.00	0.08	0.56	14.67	6.41
KIN-228	0.00	0.16	0.56	12.66	4.04
KIN-229	0.36	0.08	0.52	21.32	6.65
KIN-230	0.00	0.08	0.68	21.99	4.16
AMC-108+	0.00	0.04	0.28	15.32	5.89
HC-583+	0.00	0.08	0.60	21.33	3.99

*+ Check germplasm, *Mean data of insect pests recorded at 30, 45, 60, 75 and 90 DAS*

Coochbehar: The seed were received on 22.06.2020 and sown on 23.06.2020 but unfortunately there were excessive and continuous rainfall at Pundibari, Coochbehar. Due to prolonged waterlogging / flooding condition and ultimately the seeds were washed out or damaged. Depending on the field condition and weather condition the experiment was re-sown on 24.08.2020 with reduced plot size of 2m x 3m with excess seeds which was available after first sowing but in spite of re-sowing more than 90% of seeds did not germinate.

NP(FP) 2.5: Management of flax wilt caused by *Fusarium oxysporum* f. sp. Lini Schlecht

The trial was allotted to Nagaon, Coochbehar and Pratapgarh centres and the centre wise results are presented below:

Nagaon: Flax wilt was observed during the early stage of the crop, which gradually diminishes with the age of the crop. In the present study wilt was recorded from 30 day old crop to 90 day old crop. Treatment effect was significant during both 30 days and 60 days crop. During both the dates, T_1 and T_2 treatments (seed treatment with carbendazim 50% WP and azoxystrobin 25% SC respectively) recorded lower wilt incidence and they were statistically at par. Plant height and green weight for the two treatments i.e., seed treatment with carbendazim 50WP and azoxystrobin 25% SC were significantly higher than that of the control treatment (table 3.23).

Flax crop in Nagaon centre

Table 3.23 Wilt incidence, plant height and green weight in flax at Nagaon, Assam

Treatment	Wilting (%)			Plant height (cm)	Green weight (q/ha)
	30 days	60 days	90 days		
T_1	6.58 (14.65)	8.20 (16.58)	1.72 (5.30)	105.34	105.15
T_2	7.77 (15.99)	7.71 (16.03)	1.87 (6.76)	107.25	107.08
T_3	10.86 (19.19)	12.62 (20.77)	3.14 (10.08)	102.58	100.89
T_4	11.39 (19.65)	13.66 (21.61)	3.34 (10.43)	101.50	99.27
T_5	14.03 (21.94)	15.07 (22.8)	4.41 (12.04)	99.90	98.23
$CD_{(P=0.05)}$	3.28	3.03	NS	4.03	6.03

Data within parentheses are arc sine transformed values

T_1= Seed treatment with carbendazim (50% WP) @ 2 g/kg seed, T_2 = Seed treatment with azoxystrobin (25 % SC) @ 1.0 ml/kg seed, T_3 = Seed treatment with *T. harzianum* (NBAH-Th-10 strain) @ 10 g/kg seed + soil treatment with *T. harzianum* (1: 100 kg FYM) @ 1kg/ha, T_4 = Soil application of neem cake @ 100 g/sq m, T_5 = Control

Pratapgarh: The perusal of data from four different treatments tested for management of flax revealed that all the treatments were effective in controlling wilt and statistically at par with each other. However, seed treatment with thiram 80% WP @ and carbendazim 50% WP @ 2 g/ kg seed recorded highest fibre yield (11.55 q/ha) and lowest wilt incidence (5.33 %) over control (10.28 q/ha) at Pratapgarh, Uttar Pradesh (table 3.24).

Table 3.24 Management of flax wilt caused by *F. oxysporum* sp *lini* schlecht at Pratapgarh, Uttar Pradesh

Treatments	Plant Height (cm)	Basal Diameter (mm)	Tiller	Green weight (kg)	Dry weight (kg)	Fibre yield (q/ ha)	Wilt Incidence (%)
T_1	117.87	3.31	2.27	13.60	5.03	11.55	5.33
T_2	119.27	3.16	2.07	13.83	4.94	10.97	10.24
T_3	116.67	3.34	1.93	13.77	4.96	11.28	11.04
T_4	114.00	3.16	2.20	13.67	5.34	11.28	10.92
T_5	117.27	3.25	2.20	13.70	5.08	10.28	19.37
SEm±	2.14	0.15	0.14	0.50	0.16	0.34	1.00
$CD_{(P=0.05)}$	7.00	0.48	0.45	1.64	0.53	1.11	3.26

T_1 : Seed treatment with Thiram (80% WP) and carbendazim (50% WP) @ 2gm/kg seed; T_2 : Seed treatment with Azoxystrobin (25% SC) @ 1.0 ml/kg seed; T_3: Seed treatment with *Trichoderma harzianum* (NBAII-Th-10 strain) @ 10g/kg seed + soil application with *T. harzianum* (1:100) FYM@ 1kg/ha.; T_4: Soil application of Neem cake @ 100 gm/sq. m.; T_5: Control

Coochbehar: The experiment was not conducted because the sowing was not done.

NP(ME) 4.6: Eco-friendly management of sucking pests in mesta

The trials were allotted to Katihar and Kendrapara. The center-wise results are presented below:

Katihar: The sucking pest infestation in treatment differed significantly and found to be superior over control. Among the treatments, T_5 (NSKE 5% at 35 DAS + Azadirachtin (1500ppm) @ 5ml/L at 50 DAS + *Verticillium lecani* @ 6g/L at 65 DAS) was found superior over all treatment followed by T_6 (Profenophos @

2 ml/L at 35, 50 and 65 DAS) to control white fly population. Also, treatment T_5 was found effective control of leafhopper which was statistically at par with T_6 and T_2 treatments (spray of NSKE 5% at 35, 50 and 65 DAS, respectively) (table 3.25).

Table 3.25 Eco-friendly management of sucking pests in mesta at Katihar, Bihar

Treatments	Number of insects / plant					
	Leafhoppers					
	Pre - Spray 3 Days 35 DAS	Post-Spray 9 Days 35 DAS	Pre - Spray 3 Days 50 DAS	Post-Spray 9 Days 50 DAS	Pre-Spray 3 Days 65 DAS	Post-Spray 9 Days 65 DAS
T_1	8.43	8.26	6.41	6.33	5.96	5.10
T_2	8.95	3.96	6.59	4.79	5.93	3.25
T_3	9.43	3.49	6.72	4.85	5.98	3.16
T_4	9.83	4.40	6.47	5.97	6.04	3.76
T_5	9.41	2.09	6.73	2.07	5.51	1.90
T_6	9.58	2.22	5.33	2.16	5.45	1.95
T_7	10.01	11.18	7.06	9.34	7.38	7.49
CD (P=0.05)	1.25	0.97	1.55	0.98	1.28	0.97
CV (%)	7.49	10.75	13.53	10.89	11.93	14.38
White Fly						
Treatments	**Pre - Spray 3 Days 35 DAS**	**Post-Spray 9 Days 35 DAS**	**Pre - Spray 3 Days 50 DAS**	**Post-Spray 9 Days 50 DAS**	**Pre-Spray 3 Days 65 DAS**	**Post-Spray 9 Days 65 DAS**
T_1	6.95	6.14	5.90	5.47	4.65	4.91
T_2	7.38	3.72	5.65	3.13	4.38	3.48
T_3	7.44	3.74	5.53	3.17	4.41	3.44
T_4	7.59	4.05	5.80	3.59	3.81	3.91
T_5	7.54	1.73	5.29	1.44	2.86	0.98
T_6	7.57	1.76	5.35	1.49	2.85	1.01
T_7	7.96	8.28	9.56	10.18	10.73	7.89
CD (P=0.05)	1.99	1.04	1.39	1.07	1.11	0.57
CV (%)	14.99	14.00	12.75	14.89	13.04	8.78

T_1- Seed treatment with imidacloprid 70WS@5g/kg seed, T_2- NSKE 5% at 35, 50 and 65 DAST$_3$- Azadirachtin (1500ppm)@5ml/l at 35, 50 and 65 DAS, T_4- *Verticillium lecani* @ 6g/L at 35, 50 and 65 DAS, T_5- NSKE 5% at 35 DAS+ Azadirachtin (1500ppm) @ 5ml/L at 50 DAS+ *Verticillium lecani* @ 6g/L at 65 DAS., T_6- Profenophos @ 2 ml/L at 35, 50 and 65 DAS (Standard check), T_7- Untreated check.

Kendrapara: The experiment could not be carried out because the seeds were received late and thereafter heavy rain followed by Covid-19 lockdown.

NP(JPE) 2.20: Integrated pest and disease management in jute

The trial was allotted to Barrackpore, Kendrapara, Nagaon, Katihar, and Coochbehar centres and the centre wise results are presented below:

Barrackpore: The effect of planting methodology and insecticidal treatments were evaluated for integrated pest and disease management in jute. Yellow mite incidence was recorded at 30, 40 and 50 DAS while that of stem rot was recorded at the harvesting stage of the crop. There was no infestation of hairy caterpillar and semilooper observed. Except at 40 DAS there was significant difference between the planting methodologies evaluated. At 30 DAS and 50 DAS, line sowing methodology harbored less mite population (14.41 mites/cm^2 and 13.08 mites/cm^2). Similarly, there was significant difference between treatments [T_1, T_2 and control (T_3)] in reducing the mite population, wherein T_1 was superior over other two treatments (T_2 and T_3) when evaluated in reducing the mite population at 30 DAS to 50 DAS (6.13 - 6.38 mites/cm^2) (table 3.26). Though there was significant difference among the treatments in management of stem rot in jute. Treatment (T_1; 6.25 PDI) was superior over (T_2; 10.75 PDI) in reducing the stem rot disease incidence. Likewise there was no significant difference between the planting methodologies evaluated for integrated management of stem rot disease in jute. There was significant difference between the treatments and planting methodologies evaluated for yield parameter with P_1T_1 being the best combination in getting maximum yield (28.17 q/ha) (table 3.27).

Table 3.26 Effect of IPM treatments on yellow mite population (no/sq cm leaf area) at Barrackpore, West Bengal

Yellow mite population (mites/cm^2)												
MP/T	30 DAS				40DAS				50DAS			
	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean
P_1	4.25	12.5	26.5	14.41	5.5	12.75	18.25	12.16	5.25	11.25	22.75	13.08
P_2	8.50	16.50	28.75	17.92	7.25	15.75	24.5	15.83	7.00	14.75	30.00	17.25
Mean	6.38	14.50	27.63		6.38	14.25	21.38		6.13	13.00	26.38	
CD(0.05)	P=0.95;T=5.5; PxT=NS				P=NS;T=4.69; PxT=NS				P=3.39;T=5.56; PxT=NS			

P_1=Line sowing (5-6 lakhs/ha), P_2=Broadcast (5-6 lakhs/ha);

T_1-Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS; T_2-Seed treatment with *Trichoderma* @ 10g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS; T_3 - Control

Table 3.27 Effect of IPM treatments on stem rot (PDI) at Barrackpore, West Bengal

MP/T	Stem Rot (PDI)				Yield(q/ha)			
	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean
P_1	6.25	10.75	13.5	10.17	28.17	23.66	21.53	24.78
P_2	5.85	9.5	12.25	9.2	26.01	24.52	20.91	23.81
Mean	6.01	10.12	12.87		27.09	24.09	21.22	
CD(0.05)	P=NS;T=2.91;PxT=NS				P=0.72; T=1.67; PxT=NS			

P_1=Line sowing (5-6 lakhs/ha), P_2=Broadcast (5-6 lakhs/ha);

T_1 : Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS; T_2 : Seed treatment with *Trichoderma* @ 10g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS; T_3 : Control

Nagaon: Yellow mite population was observed on 30 day and 40 day old crops Bihar hairy caterpillar and semilooper incidence was recorded on 55 and 70 DAS. Stem rot was recorded at harvesting stage. At 30 DAS, mite population was at par on both line sown crop (P_1) and broadcasted crop (P_2). At 40 DAS, mite population significantly varied among treatments without any significant variation among the line sown or broadcasted crop. Mite population, 3.03 mites/sq. cm leaf area was highest in control plots (T_3). T_1 recorded significantly lower mite population (0.67 mite/sq.cm) than both T_2 (2.3 mites/sq. cm leaf area) and control, T_3 (3.03 mites/sq.cm leaf area). This may be the effect of spiromesifen spray on 35 day old crop. But azadirachtin spray did not reveal any significant difference of mite population with that of control plots. (table 3.28). At 55 DAS, neither planting method nor treatment had significant effect on plant damaged by Bihar hairy caterpillar. On 70 DAS, both T_1 (16.56 %) and T2 (23.1%) showed significantly lower plant infestation by the caterpillar than that in the control, T_3 (27.55%) plots. But, plant infestation was significantly lower in T_1 than T_2, which indicated superiority of lamda cyhalothrin treatment over azadirachtin treatment in caterpillar control (table 3.29). Jute semilooper infestation showed no significant difference on the 55 DAS with regards to either treatment or planting type. On 70 DAS, treatment T_1 (7.72%) and T_2 (10.93%) revealed significantly lower plant infestation by semilooper than that of control, T_3 (15.96%). Treatment, T_1 revealed significantly better performance in semilooper management that that of treatment T_2 (table 3.30). Stem rot were recorded before harvest. Only treatments revealed significant effect on stem rot incidence. Both T_1 (PDI 2.54) and T_2 (PDI 3.27) showed significantly lower stem rot incidence than that of control, T_3 (PDI 4.78). Stem rot incidence was at par in T_1 and T_2 treatments. Fibre yield was significantly higher in T_1 (27.48 q/ha) and T_2 (25.89 q/ha) than that of the control, T_3 (21 q/ha). But, fibre yield of T_1 treatment was significantly higher than that of T_2 (table 3.31).

IPM of Insect Pests and diseases in Nagaon

Table 3.28 Effect of IPM treatments on yellow mite population (no/sq cm leaf area) at Nagaon, Assam

MP/T	Yellow mite population (no/cm²)							
	30 DAS				40 DAS			
	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean
P_1	2.97	2.87	3.20	3.01	0.48	2.46	3.30	2.08
P_2	3.60	3.05	3.65	3.43	0.85	2.12	2.74	1.91
Mean	3.28	2.96	3.42		0.66	2.29	3.02	
CD (0.05)	P=NS, T=NS, P x T =NS				P= NS, T= 0.858, P x T = NS			

P_1= Line sowing; P2= broadcasting; T_1 = Seed treatment with Carbendazim 50 WP @ 2g/kg seed + Spraying of Spiromesifen 240 SC@ 0.7 ml/l water at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of Lamda cyhalothrin 5 EC @ 0.6 ml/l at 55 DAS; T_2 = Seed treatment with *Thricoderma* @ 10 g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/l at 15 DAS + spraying of Azadirachtin (10000 ppm) @ 3 ml/l at 35 and 55 DAS; T_3 = Control

Table 3.29 Effect of IPM treatments on infestation of Bihar hairy caterpillar at Nagaon, Assam

Bihar hairy caterpillar (%)									
55 DAS					70 DAS				
MP/T	T_1	T_2	T_3	Mean	MP/T	T_1	T_2	T_3	Mean
P_1	25.46 (30.90)	25.19 (30.03)	26.73 (31.09)	25.79 (30.68)	P_1	14.59 (22.37)	21.59 (27.58)	26.11 (30.7)	20.76 (26.88)
P_2	29.10 (32.61)	27.95 (31.89)	29.32 (32.76)	28.79 (32.42)	P_2	18.52 (25.45)	24.61 (29.71)	28.98 (32.54)	24.04 (29.23)
Mean	27.28 (31.76)	26.57 (30.96)	28.03 (31.93)		Mean	16.56 (23.91)	23.1 (28.64)	27.55 (31.61)	
CD (0.05)	P=NS, T=NS, P x T = NS				CD (0.05)	P=NS, T=2.66, P x T = NS			

NB: Data within parentheses are arcsine transformed values

P_1= Line sowing; P_2= broadcasting; T_1 = Seed treatment with Carbendazim 50 WP @ 2g/kg seed + Spraying of Spiromesifen 240 SC@ 0.7 ml/l water at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of Lamda cyhalothrin 5 EC @ 0.6 ml/l at 55 DAS; T_2 = Seed treatment with *Thricoderma* @ 10 g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/l at 15 DAS + spraying of Azadirachtin (10000 ppm) @ 3 ml/l at 35 and 55 DAS; T_3 = Control

Table 3.30 Effect of IPM treatments on infestation of jute semilooper at Nagaon, Assam

Jute Semilooper (%)									
55 DAS					70 DAS				
MP/T	T_1	T_2	T_3	Mean	MP/SP	T_1	T_2	T_3	Mean
P_1	15.08 (22.69)	13.94 (21.85)	14.26 (22.06)	14.43 (22.20)	P_1	8.14 (16.39)	10.23 (18.58)	15.29 (22.96)	11.22 (19.31)
P_2	13.89 (21.75)	15.61 (23.19)	15.38 (23.04)	14.96 (22.66)	P_2	7.29 (15.46)	11.63 (19.89)	16.63 (24.01)	11.85 (19.78)
Mean	14.46 (22.22)	14.78 (22.53)	14.82 (22.55)		Mean	7.72 (15.93)	10.93 (19.24)	15.96 (23.49)	
CD (0.05)	P=NS, T=NS, P x T = NS				CD (0.05)	P=NS, T=2.79, P x T = NS			

NB: Data within parentheses are arcsine transformed values

P_1= Line sowing; P2= broadcasting; T_1 = Seed treatment with Carbendazim 50 WP @ 2g/kg seed + Spraying of Spiromesifen 240 SC@ 0.7 ml/l water at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of Lamda cyhalothrin 5 EC @ 0.6 ml/l at 55 DAS; T_2 = Seed treatment with *Thricoderma* @ 10 g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/l at 15 DAS + spraying of Azadirachtin (10000 ppm) @ 3 ml/l at 35 and 55 DAS; T_3 = Control

Table 3.31 Effect of IPM treatments on stem rot (PDI) and yield (q/ha) at Nagaon, Assam

MP/T	Stem Rot (PDI)				MP/T	Yield (q/ha)			
	T_1	T_2	T_3	Mean		T_1	T_2	T_3	Mean
P_1	2.61 (9.19)	3.46 (10.58)	4.09 (11.61)	3.38 (10.46)	P_1	28.24	27.04	21.55	25.61
P_2	2.46 (8.88)	3.09 (9.92)	5.47 (13.42)	3.71 (10.74)	P_2	26.73	24.76	20.47	23.99
Mean	2.54 (9.03)	3.27 (10.25)	4.78 (12.51)		Mean	27.48	25.89	21.00	
CD (0.05)	P= NS, T=2.16, P x T = NS				CD (0.05)	P=NS, T=1.38, P x T = NS			

NB: Data within parentheses are arcsine transformed values

P_1= Line sowing; P2= broadcasting; T_1 = Seed treatment with Carbendazim 50 WP @ 2g/kg seed + Spraying of Spiromesifen 240 SC@ 0.7 ml/l water at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of Lamda cyhalothrin 5 EC @ 0.6 ml/l at 55 DAS; T_2 = Seed treatment with *Thricoderma* @ 10 g/kg seed + soil drenching of *Pseudomonas fluorescence* @ 100 g/l at 15 DAS + spraying of Azadirachtin (10000 ppm) @ 3 ml/l at 35 and 55 DAS; T_3 = Control

Katihar: The effect of line sowing and broadcasting method and chemical treatments were evaluated against insect pest control. The main effect of planting was significant against all the pests and significantly lowest infestation was in line sown crop over the broadcast sowing. The pesticide treatments differed significantly and found superior over control. The low incidence of mites were recorded in T_1 (11.08, 7.40 and 4.43 mite/cm^2) at 30 DAS, 40 DAS and 50 DAS followed by T_2 (12.00, 9.16 and 5.21 mite/cm^2) (table 3.32). The low incidence of BHC were observed in T_1 (11.64%) 70 DAS which was at par to T_2 (13.64%) (table 3.33). The semilooper incidence were low in T_1 after 70 DAS show significant lower (10.21%) followed by T_2 (12.09) (table 3.34).

Table 3.32 Effect of IPM treatments on infestation of yellow mite at Katihar, Bihar

P/T	Mite population (No./cm^2)											
	30 DAS				40 DAS				50 DAS			
	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean	T_1	T_2	T_3	Mean
P_1	10.29	11.30	13.14	11.58	6.71	8.70	12.66	9.35	3.83	4.48	15.28	7.86
P_2	11.87	12.70	15.07	13.21	8.10	9.62	13.62	10.44	4.85	5.94	16.53	9.11
Mean	11.08	12.00	14.10		7.40	9.16	13.14		4.34	5.21	15.91	
$CD_{(P=0.05)}$ P = 1.26, T = 2.66 P X T = NS					$CD_{(P=0.05)}$ P = 0.67, T = 1.27, P X T = NS				$CD_{(P=0.05)}$ P = 0.72, T = 1.12, P X T = NS			

P_1 Line sowing- (5-6 lakhs/ha), P_2 Broadcast- (5-6 lakhs/ha); T_1-Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS. T_2-Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS. T_3 - Control

Table 3.33 Effect of IPM treatments on infestation of jute hairy caterpillar at Katihar, Bihar

P/T	Bihar Hairy Caterpillar (%)								
	55 DAS				70 DAS				
	T_1	T_2	T_3	Mean		T_1	T_2	T_3	Mean
P_1	14.30	16.22	19.52	16.68	P_1	10.48	12.05	20.75	14.43
P_2	16.18	18.45	22.09	18.90	P_2	12.79	15.24	23.65	17.23
Mean	15.24	17.33	20.80			11.64	13.64	22.20	
$CD_{(P=0.05)}$ P = 1.79, T = 2.81 P X T = NS					$CD_{(P=0.05)}$ P = 1.66, T = 2.22, P X T = NS				

P_1 : Line sowing- (5-6 lakhs/ha), P_2 Broadcast- (5-6 lakhs/ha); T_1: Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS. T_2: Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS. T_3 :Control

Table 3.34 Effect of IPM treatments on infestation of semilooper at Katihar, Bihar

P/T	Semilooper (%)								
	55 DAS				70 DAS				
	T_1	T_2	T_3	Mean		T_1	T_2	T_3	Mean
P_1	20.06	23.69	28.19	23.98	P1	9.77	11.38	31.33	17.49
P_2	22.75	25.10	32.54	26.79	P2	10.64	12.80	34.58	19.34
Mean	21.40	24.39	30.36			10.21	12.09	32.95	
CD (P=0.05) P = 2.26, T = 3.50 P X T = NS					CD (P=0.05) P = 1.08, T = 2.19, P X T = NS				

P_1: Line sowing- (5-6 lakhs/ha), P_2: Broadcast- (5-6 lakhs/ha); T_1: Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS. T_2: Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS. T_3 : Control

Katihar: The pathology experimental trial was failed due to incessant rainfall and thereafter water logging since July month.

Coochbehar: No significant difference in stem rot severity was recorded between line sowing and broadcasting method of sowing, however, integrated module for stem rot management had significant effect. Stem rot severity in broadcasted plot irrespective of the effect of management modules was 26.59%, whereas, the same in line sown crop was 25.93%. Bio-intensive management module (P_1T_2 and P_2T_2) as sub plot effect showed significantly high stem rot severity (26.57% and 26.34%) compared to chemical pesticide based management module (P_1T_1 and P_2T_1) which exhibited 22.96% and 24.54% stem rot irrespective of the effect of method of sowing. Both the management modules as obvious were significantly differing from control (28.27% and 28.12%) (table 3.35). Similar trend was found in yield also. Line sowing as main plot effect showed comparatively higher fibre yield (12.35 q/ha) than broadcasted crop (10.63 q/ha). Management module as sub plot effect had significant difference, where bio-intensive management module fibre yield (P_1T_2 and P_2T_2) was (14.94 q/ha and 11.51 q/ha) differed statistically from chemical pesticide based management module (P_1T_1 and P_2T_1) was (13.97 q/ha and 13.05 q/ha) (table 3.36).

Table 3.35 Effect of integrated management modules on stem rot severity in *olitorius* jute at harvesting stage in Coochbehar, West Bengal

Treatments	Stem rot (PDI)			
	T_1	T_2	T_3	Mean
P_1	22.96	26.57	28.27	25.93
P_2	24.54	26.34	28.88	26.59
Mean	23.75	26.46	28.58	
	Main plot (MP)	Sub plot (SP)	MP X SP	
SEm±	0.802	1.44	1.85	
$CD_{(P=0.05)}$	2.55	4.6	4.22	

P_1: Line sowing- (5-6 lakhs/ha), P_2: Broadcast- (5-6 lakhs/ha); T_1: Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS. T_2: Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS. T_3 : Control

Table 3.36 Effect of integrated pest management modules on fibre yield of *olitorius* jute in Coochbehar, West Bengal

Treatments	Fibre yield (q/ha)			
	T_1	T_2	T_3	Mean
P_1	13.97	14.94	8.13	12.35
P_2	13.05	11.51	7.32	10.63
Mean	13.51	13.23	7.73	
	Main plot (MP)	Sub plot (SP)	MP X SP	
SEm±	0.19	0.92	1.08	
$CD_{(P=0.05)}$	0.60	2.92	2.36	

P_1: Line sowing- (5-6 lakhs/ha), P_2: Broadcast- (5-6 lakhs/ha); T_1: Seed treatment with Carbendazim 50WP @ 4g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebucanazole @ 0.15% at 45 DAS + spraying of λ-cyhalothrin 5 EC @ 0.6 ml/L at 55 DAS. T_2: Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100 g/L at 15 DAS + spraying of Azadirachtin (10000ppm) @ 3ml/L at 35 DAS and 55 DAS. T_3 : Control

Coochbehar: Yellow mite population (number/cm^2 of 2nd unfold leaf) was recorded on 30, 40 and 50 days after sowing but no mite infestation and damage was observed till 40 DAS. Post treatment mite population showed significant difference for both the factors at 50 DAS with least population of 0.89 mites/sq. cm in the P_1T_1 treatment. The semilooper and Bihar hairy caterpillar incidence was recorded on 55 & 70 DAS. Post treatment semilooper population at 55 & 70 DAS varied significantly for both factors and lowest population were observed in treatment P_1T_2 (5.83 %) and P_1T_1 (1.34 %) respectively. Similarly the Bihar hairy caterpillar population showed significant difference for both the factors as well as interaction level during 55 DAS and 70 DAS. The lowest population was recorded for the treatment P_1T_2 (11.14 %) at 55 DAS and P_1T_1 (5.75 %) at 70 DAS (table 3.37).

Kendrapara: The effect of line sowing, broadcasting and chemical treatments were evaluated for integrated management of insect pests and diseases in jute. The effect of sowing method was non-significant in yellow mite infestation. At 50 DAS line sown crop recorded less mite infestation (8.2 mites/sq.cm of 2nd unfolded leaf) than broad cast crop. At 40 DAS, the highest mite population (15 mite/cm^2) was recorded in T3. In case of semilooper, the effect of treatments on damage (%) showed similar trend as in case of mite. At 70 DAS, the line sown crop had significantly less infestation (8.70%) than broadcast sown (11.90%). At 110 DAS, the percentage of disease index (PDI) is lowest in P1 (12.5) i.e. line sowing with plant population 5-6 lakhs per ha followed by P2 (17.60). Among the three treatments, T1 (PDI 5.1) is the best treatments for controlling the stem rot disease, followed by T2 (13.00). Overall combination of T1 with P1 gives best result for management of stem rot disease in jute. From this trial, P1T1 has higher yield 26.75q/ha than P2T1 (24.75q/ha) P2T1 gives yield (24.75q/ha) than P2T2 (22.50q/ha).In all case T3 (control) had maximum occurrence of diseases and showed lower yield.

IPM of Insect Pests and diseases in Kendrapa

Table 3.37 Effect of integrated management modules on insect pests in *olitorius* jute at harvesting stage in Coochbehar, West Bengal

Treatments		Semilooper infestation (%)		Bihar Hairy Caterpillar (%)		Mite population/cm²			Fibre yield (q/ha)	
Main plots	Sub plots	Count at 55 DAS	Count at 70 DAS	Count at 55 DAS	Count at 70 DAS	Count at 30DAS	Count at 40 DAS	Count at 50 DAS		
P1	T1	6.29	1.34	14.81	5.75	0.00	0.00	0.89	13.97	
	T2	5.83	1.55	11.14	7.45	0.00	0.00	1.46	14.94	12.35
	T3	6.74	6.22	17.20	14.16	0.00	0.00	3.63	8.13	
P2	T1	6.80	2.18	15.86	6.70	0.00	0.00	1.06	13.05	
	T2	6.16	2.83	12.34	8.57	0.00	0.00	1.90	11.51	10.63
	T3	7.04	6.85	20.36	16.98	0.00	0.00	3.85	7.32	
MP	SEm±	0.073	0.066	0.174	0.095	--	--	0.036	0.189	
	$CD_{(P=0.05)}$	0.328	0.297	0.784	0.427	--	--	0.160	0.603	
SP	SEm±	0.103	0.128	0.169	0.201	--	--	0.077	0.916	
	$CD_{(P=0.05)}$	0.317	0.395	0.521	0.620	--	--	0.237	2.917	
Interaction	SEm±	0.139	0.162	0.262	0.251	--	--	0.096	1.075	
	$CD_{(P=0.05)}$	0.484	0.538	0.971	0.824	--	--	0.313	2.36	

MP : Main plot, SP: Sub-plot P_1: Line sowing, P_2:Broadcasting, T_1: Seed treatment with carbendazim 50WP @ 2g/kg seed + spraying of Spiromesifen 240 SC @ 0.7 ml/lit at 35 DAS + spraying of Tebuconazole @ 0.15% at 45 DAS + spraying of λ- cyhalothrin 5 EC @0.6 ml/L at 55 DAS, T_2 : Seed treatment with Trichoderma @ 10g/kg seed + soil drenching of Pseudomonas fluorescence @ 100g/L at 15 DAS + spraying of Azadiractin (10000 ppm)@3ml/L at 35 DAS and 55DAS, T_3 : Control

Table 3.37a Interaction effect of plant population and different level of plant protection management modules in jute at Kendrapara, Odisha

Yellow mite (no.of.mite /cm²)												
30 DAS					40 DAS				50 DAS			
	T1	T2	T3	Mean	T1	T2	T3	Mean	T1	T2	T3	Mean
P1	10.50	8.50	12.75	10.60	5.00	7.75	15.0	9.30	6.00	5.75	12.75	8.20
P2	12.00	13.75	16.5	14.10	7.25	12.00	17.0	12.10	5.75	12.75	15.25	11.30
Mean	11.30	11.10	14.6	12.30	6.10	9.90	16.0	10.70	5.90	9.30	14.0	9.70
	CD (5%)	CV (%)			CD (5%)	CV (%)			CD (5%)	CV (%)		
P	2.3	17.6			1.5	13.1			1.4	13.5		
T	2.3	15.9			2.8	21.9			2.5	21.3		
TXP	NS				NS				NS			

Table 3.37b Interaction effect of plant population and different level of plant protection management modules in jute at Kendrapara, Odisha

	Semilooper (Plant damage %)								Stem rot PDI at 110 DAS				Fibre yield (q/ha)			
	55 DAS				70 DAS											
	T1	T2	T3	Mean	T1	T2	T3	Mean	T1	T2	T3	Mean	T1	T2	T3	Mean
P1	11.25	10.00	12.75	11.30	3.50	6.25	16.25	8.70	5.10	13.0	19.30	12.5	26.75	24.5	18.75	23.3
P2	12	13.75	16.25	14.00	5.50	11.5	18.75	11.90	9.50	18.6	24.60	17.6	24.75	22.5	18	21.8
Mean	11.6	11.9	14.5	12.70	4.50	8.9	17.5	10.30	7.30	15.8	22.00	15.0	25.8	23.5	18.4	22.5
	CD (5%)	CV (%)			CD (5%)	CV (%)			CD (5%)	CV (%)			CD (5%)	CV (%)		
P	1.2	9.1			1.5	13.9			1.9	11.9			NS	9.7		
T	NS	21.5			1.49	12.2			1.8	9.9			0.99	4.0		
TXP	NS				2.12				NS				NS			

NP(JP) 2.60 Intensive screening of *C. olitorius* jute germplasm against stem rot diseases

The trial was allotted to Barrackpore, Kendrapara, Coochbehar, Katihar and Nagaon centres and the centre wise results are presented below:

screening of C. olitorius jute germplasm against stem rot diseases

Nagaon: Fourteen *olitorius* and two *capsularis* germplasm were screened against stem rot disease. The varieties were sown on 06.05.2020. Along with stem rot, anthracnose disease was also recorded. The intensity of stem rot was recorded in 75, 90, 105 and 120 days. The disease intensity gradually increased and significant differences were found among the tested germplasm at all the recorded dates. Both the *capsularis* germplasm recorded significantly higher stem rot incidence than on *olitorius* germplasm on all the dates. On 75 day and 90 day old crop, JRC-412 recorded significantly higher stem rot incidence than that on CIM-10 and became at par on 105 day and 120 day. All other germplasm were at par among them but significantly lower than both the *capsularis* germplasm. On 120 day old crop, among *olitorius* germplasm, OIN-853 recorded significantly higher stem rot incidence than OIN 02, OIN-21, OIN-027, OIN-154 and OIN-651. Similarly, OIN-07 recorded significantly higher stem rot incidence than that of OIN-21, OIN-027, OIN-154 and OIN-651. Rest of the germplasm was at par. Germplasm OIN-154, OIN-21, OIN-27 and OIN-651 recorded lower stem rot incidence. Anthracnose varied significantly among germplasm on 120 day old crops. Germplasm OIN-02, OIN-04, OIN-13, OIN-14, OIN-27 and OIN-853 were at par and recorded lower anthracnose incidence among the germplasm. Fibre yield was at par among the *olitorius* germplasm but significantly higher than the *capsularis* germplasm (table 3.38).

Katihar: The experimental trial was failed due to incessant rainfall and thereafter water logging since July.

Coochbehar: All the germplasm varied significantly in stem rot occurrence throughout the experimental period. The rate of increase in disease spread was maximum between 60-90 days of crop age. Lowest stem rot occurrence at final stage of disease record was found in OIN-04 (5.63%) which was statistically at par with OIN-21 (5.85%), OIN-13 (6.41%) and OIN-16 (6.05%). Highest stem rot severity was recorded at 90 days of crop age was in JRC-412 (34.03%) which was statistically at par with OIN-05 (34.12%), OIN-154 (33.41%), OIN-125 (31.12%) and OIN-64 (30.22%). The fibre yield of the test germplasm also varied significantly. The highest fibre yield was recorded in OIN-13 (21.67 q/ha) which was statistically at par with OIN-16 (21.33 q/ha), OIN-04 (20.33 q/ha) and OIN-21 (20.00 q/ha). The lowest fibre yield was logged in JRC-412 (6.96 q/ha) which was statistically at par with OIN-05(7.34 q/ha) and OIN-154 (7.98 q/ha) (table 3.39).

Table 3.38 Performances of different *C. olitorius* germplasm against stem rot (PDI) & anthracnose (PDI) at Nagaon, Assam

Germplasm	Stem rot (PDI)*				Anthracnose (PDI)*		Fibre Yield (q/ha)
	75 days	90 days	105 days	120 days	105 days	120 days	
OIN- 02	0.12 (1.15)	0.19 (1.93)	1.39 (6.65)	3.15 (10.13)	2.67 (7.63)	6.00 (14.01)	27.48
OIN-04	0.15 (1.78)	0.23 (2.71)	2.01 (7.97)	4.68 (12.40)	3.33 (10.47)	7.17 (15.39)	28.10
OIN-05	0.09 (0.97)	0.11 (1.11)	1.58 (7.14)	3.78 (10.97)	3.17 (8.39)	9.83 (18.15)	28.26
OIN-07	0.11 (1.56)	0.17 (1.89)	1.29 (6.46)	5.17 (13.11)	1.50 (4.08)	11.67 (19.70)	26.79
OIN-13	0.08 (0.94)	0.15 (1.72)	1.88 (7.62)	4.04 (11.39)	4.00 (11.22)	5.50 (13.32)	28.04
OIN-14	0.08 (0.94)	0.23 (2.09)	2.06 (8.02)	4.21 (11.78)	2.17 (6.87)	5.83 (13.86)	27.64
OIN-16	0.15 (1.78)	0.20 (2.08)	2.21 (8.49)	3.27 (10.39)	4.33 (11.92)	11.33 (19.63)	26.55
OIN-21	0.05 (0.76)	0.08 (0.94)	1.39 (6.64)	2.97 (9.91)	3.67 (10.93)	12.00 (20.01)	28.45
OIN-27	0.07 (0.88)	0.09 (1.01)	1.81 (7.68)	3.03 (9.93)	2.67 (7.67)	7.50 (15.79)	29.36
OIN-64	0.11 (1.11)	0.15 (1.27)	1.51 (6.94)	3.42 (10.49)	5.17 (13.07)	8.17 (16.49)	28.22
OIN-125	0.13 (1.65)	0.18 (1.92)	1.62 (7.22)	3.37 (10.50)	5.50 (13.34)	12.67 (20.72)	26.83
OIN-154	0.06 (0.81)	0.07 (0.88)	1.17 (6.18)	2.31 (8.73)	3.17 (8.39)	10.67 (18.28)	26.95
OIN-651	0.23 (2.22)	0.28 (2.49)	1.81 (7.65)	2.98 (9.83)	2.67 (7.63)	9.00 (17.25)	27.85
OIN-853	0.19 (1.95)	0.26 (2.31)	2.53 (9.08)	5.28 (13.22)	4.33 (11.84)	7.83 (16.14)	28.88
CIM-10	3.20 (9.91)	4.17 (11.53)	6.09 (14.04)	9.64 (18.01)	8.83 (17.21)	19.33 (26.06)	23.06
JRC-412	5.32 (13.12)	6.29 (14.32)	8.03 (16.12)	11.28 (19.54)	9.00 (17.27)	16.17 (23.61)	22.70
CD (0.05)	2.41	2.54	3.34	3.03	NS	5.36	2.75

**: Data within parentheses are arc sine transformed values*

Table 3.39 Evaluations of jute germplasm against stem rot disease at Coochbehar, West Bengal

Germplasm	Stem rot (PDI)			Fibre yield (q/ha)
	60 DAS	75 DAS	90 DAS	
OIN-02	5.23	13.83	26.12	13.67
OIN-04	0.36	1.43	5.63	20.33
OIN-05	14.32	28.25	34.12	7.34
OIN-07	7.23	15.14	28.11	12.45
OIN-13	2.09	3.83	6.41	21.67
OIN-14	4.13	10.04	15.26	18.12
OIN-16	1.83	3.49	6.05	21.33
OIN-21	1.68	3.12	5.85	20.00
OIN-27	3.64	8.38	17.88	16.12
OIN-64	9.61	21.12	30.22	10.23
OIN-125	10.16	25.04	31.12	9.67
OIN-154	13.41	26.01	33.41	7.98
OIN-651	9.35	18.04	26.45	13.23
OIN-853	1.45	8.23	15.11	18.33
CIM-01	2.57	9.45	17.23	16.47
JRC-412	16.23	25.21	34.03	6.96

Kendrapara: Out of 16 lines evaluated, lowest PDI of 4.0, 4.33, 4.51 and 4.59 were recorded in OIN-21, OIN-125, OIN-07 and OIN-154 line respectively. Germplasm having PDI value 5 to 10 were OIN-02,OIN-04,OIN-05,OIN-13,OIN-14,OIN-16,OIN-27,OIN-64,) OIN-651,OIN-853 and CIM-10 which are moderately susceptible to stem rot disease. Germplasm having PDI value more than 10 was JRC-412 which was susceptible to stem rot disease. Highest yield of 26 q/ha was obtained from line OIN-13 in comparison to check variety JRC-412 where the yield was 17.67 q/ha (table 3.40).

screening of C. olitorius jute germplasm against stem rot diseases

Table 3.40 Evaluations of jute germplasms against stem rot disease at Kendrapara, Odisha

Germplasm	Total plant	Root Rot (%)	RR Score	Stem Rot (%)	Stem rot rating	SR Score	Total Score	PDI (90 DAS)	Fibre yield (q/ha)
OIN-02	309.33	12.33	197.33	29.67	10.00	295.00	492.33	9.30	21.33
OIN-04	306.67	8.00	128.00	20.00	9.67	192.00	320.00	6.30	25.00
OIN-05	294.33	17.67	282.67	12.33	5.00	62.00	344.67	7.00	23.67
OIN-07	309.33	12.00	192.00	12.00	3.67	42.67	234.67	4.51	24.67
OIN-13	306.67	15.33	245.33	13.33	4.67	61.33	306.67	5.66	26.00
OIN-14	294.33	11.00	176.00	29.67	3.33	98.33	274.33	6.06	21.67
OIN-16	309.33	12.67	202.67	20.00	3.67	74.67	277.33	5.47	24.67
OIN-21	306.67	9.00	144.00	12.33	4.67	58.67	202.67	4.00	24.67
OIN-27	294.33	16.00	256.00	12.00	6.33	74.00	330.00	7.17	22.00
OIN-64	309.33	10.33	165.33	13.33	8.67	116.67	282.00	5.66	24.33
OIN-125	306.67	6.67	106.67	11.33	7.00	80.33	187.00	4.33	25.33
OIN-154	294.33	9.67	154.67	8.00	7.33	58.67	213.33	4.59	24.50
OIN-651	331.67	10.33	165.33	13.33	7.33	99.33	264.67	5.22	22.17
OIN-853	298.33	14.00	224.00	13.33	8.00	103.33	327.33	6.70	20.33
CIM-10	276.33	10.00	160.00	10.67	6.33	64.67	224.67	5.10	22.33
JRC-412+	293.00	27.67	442.67	24.67	7.33	178.67	621.33	14.56	17.67
$CD_{(P=0.05)}$	--	--	--	--	--	--	--	1.22	2.48
CV (%)	--	--	--	--	--	--	--	11.53	6.43

+: Check

NP(JE) 6.6: Intensive screening of *C. olitorius* germplasms against yellow mite

The trial was allotted to Katihar, Kendrapara, Coochbehar and Nagaon centres and the centre-wise results are presented below:

Nagaon: Thirteen numbers of *olitorius* jute germplasm were sown on 08.05.2020 for intensive screening against yellow mite. The mite population (no/cm^2 of second unfurled leaf), % plant damaged by mite and yield (q/ha) were recorded for each germplasm. Mite population count and plant damage (%) were recorded at 10 days interval from 30 day old crop. Yellow mite infestation was observed on 40 day and 50 day crop only.

Intensive screening of C. olitorius jute germplasm against yellow mite

The observations indicated no significant difference in mite population as well as plants infested by mites among the tested germplasm. Highest mite population (3.00 /cm^2 of second unfurled leaf) was recorded on OIN-14 on 40 day old crop and lowest mite population (1.30 numbers/cm^2 of second unfurled leaf) was recorded in OIN-67. Apparently higher plant infestation of 24.00 % and 22.67 % was recorded on germplasm OIN-11 and OIN-14 respectively during 40 day old crop. Minimum plant infestation (10 %) was recorded in OIN-67. Though fibre yield was at par among the 13 germplasm, entries OIN-67, OIN- 21 and OIN-53 recorded apparently higher fibre yield of 28.72 q/ha, 28.16 q/ha and 28.14 q/ha respectively (table 3.41).

Table 3.41 Mite population (no/cm^2 leaf) and plant damage (%) by yellow mite at Nagaon, Assam

Germplasm	Mite population*		Plant damage* (%)		Fibre yield (q/ha)
	40 Days	50 Days	40 Days	50 Days	
OIN-10	2.17	1.50	19.33 (26.07)	13.33 (21.37)	27.26
OIN-11	2.77	2.00	24.00 (29.17)	12.67 (20.75)	25.19
OIN-14	3.00	1.83	22.67 (28.19)	13.33 (21.26)	25.59
OIN-16	1.87	1.43	16.67 (24.08)	14.00 (21.93)	26.18
OIN-19	2.23	1.53	18.67 (25.54)	12.67 (20.46)	26.72
OIN-21	2.00	1.77	14.67 (22.44)	14.67 (22.50)	28.16
OIN-34	2.17	1.67	17.33 (24.54)	14.67 (22.36)	26.79
OIN-35	2.80	1.93	22.67 (27.75)	14.67 (22.36)	26.50
OIN-53	1.70	1.20	14.00 (21.82)	10.67 (18.94)	28.14
OIN-61	2.27	1.63	17.33 (24.54)	14.00 (21.93)	27.04
OIN-67	1.30	1.10	10.00 (18.37)	12.67 (20.83)	28.72
OIJ-08	1.90	1.57	20.00 (26.54)	12.67 (20.83)	26.11
JRO-2407	2.07	1.43	14.00 (21.86)	10.67 (19.04)	26.55
$CD_{(P=0.05)}$	NS	NS	NS	NS	NS

**: Data within parentheses are arc sine transformed values*

Katihar: The number of yellow mite/sq. cm and percentage damage were evaluated among thirteen *olitorius* germplasm. Infestation started to appear from 30 DAS and continued up to 50 DAS. Yellow mite population /sq.cm were observed maximum in JRO 2407, OIN 61, OIN 67, and OIJ 08 i.e.10.81, 7.60, 6.93, 6.31 30 DAS and minimum Yellow mite population /sq.cm were observed in germplasm OIN 10, OIN 34 *i.e.* 2.58, 2.46 30 DAS. 40 DAS Yellow mite population /sq.cm were observed maximum in JRO 2407, OIN 61 i.e. 21.13, 9.78, and minimum yellow mite population /sq.cm were observed in germplasm OIN 14, OIN 16 i.e. 5.22, 6.09. Maximum damage % were observed 40 DAS in germplasm JRO 2407, OIN 61 i.e. 42.85, and 35.46.Yellow mite population /sq.cm were started decreasing after 40 DAS and continued up to 50 DAS (table 3.42).

Table 3.42 Mite population and plant damage by yellow mite at different crop age at Katihar, Bihar

Germplasm	30 DAS		40 DAS		50DAS	
	Mite/cm²	Plant Damage (%)	Mite/cm²	Plant Damage (%)	Mite/cm²	Plant Damage (%)
OIN-10	2.58	1.94	26.89	12.31	20.06	13.64
OIN-11	3.48	0.82	36.42	12.86	22.76	12.14
OIN-14	5.10	0.69	38.02	31.14	19.44	9.34
OIN-16	5.87	0.91	28.50	7.78	18.33	11.66
OIN-19	4.11	0.63	36.70	27.42	17.95	15.84
OIN-21	4.66	0.56	25.89	14.86	13.40	14.81
OIN-34	2.46	0.68	30.91	7.43	22.76	9.38
OIN-35	5.18	0.75	21.56	10.87	14.38	15.63
OIN-53	6.26	0.55	26.35	11.03	11.55	11.64
OIN-61	7.60	1.25	20.45	35.46	14.07	29.55
OIN-67	6.93	1.78	36.24	12.85	12.64	25.05
OIJ-08	6.31	1.86	37.05	23.97	10.28	20.22
JRO-2407	10.81	3.70	47.34	42.85	28.70	33.04

Kendrapara: Thirteen number of *olitorius* jute germplasm were evaluated for intensive screening against yellow mite. Mite population (number/cm² of second unfolded leaf), per cent plant damaged by mite and yield (q/ha) were recorded for each germplasm Mite population count and plant damage (%) were recorded at 10 days interval from 30DAS. Yellow mite infestation were observed on 50 DAS and continued till 60 DAS. The highest mite population (10.00/cm2 of second unfolded leaf) was recorded in OIN-10 on 60 DAS and the lowest mite population (4.67cm2 of second unfolded leaf) was recorded in JRO-2407.In case of Plant infestation by the mite, the highest infestation of 11.67 % plant damage was recorded for the entry OIN-10 60 DAS. Minimum plant infestation was recorded in OIN-53(2.33%) and OIN-34((2.67%) 70 DAS. Highest fibre yield (26.33 q/ha) was recorded in OIN-34 and lowest fibre yield (19.73 q/ha) was recorded in OIN-10 (table 3.43).

Coochbehar: Thirteen *olitorius* germplasms were evaluated against yellow mite infestation. Mite population was considerably low. No infestation and damage was observed till 40 DAS. Mite started to occur in the 3rd week of July. Among the germplasm, yellow mite population (number/sq. cm of 2nd unfold leaf) were noticed maximum in JRO-2407, OIN-35, OIN-19 and OIN-53. Comparatively lower yellow mite incidence was recorded in OIN-14, OIN-11 and OIN-21. In case of plant infestation by the mite, maximum damage was found on 60 day old crop with highest infestation recorded in JRO-2407 (10.67%) followed by OIN-35 (9.33%) and lowest damage in the entry OIN-14 (3.00%). Highest fibre yield was recorded in germplasm OIN-14 (16.80 q/ha) closely followed by OIN-11 (16.75 q/ha) (table 3.44).

Intensive screening of C. olitorius jute germplasm against yellow mite

Table 3.43 Infestation and damage of yellow mite in *C. olitorius* jute germplasm at Kendrapara, Odisha

Germplasms	50 DAS		60 DAS		70 DAS		Fibre yield (q/ha)
	Mite/cm²	Plant Damage (%)	Mite/cm²	Plant Damage (%)	Mite/cm²	Plant Damage (%)	
OIN-11	3.00	5.33	6.00	6.33	7.67	3.00	24.00
OIN-14	4.67	9.67	8.00	10.00	7.33	5.00	23.00
OIN-16	3.33	7.33	5.00	7.33	8.00	5.33	25.00
OIN-19	1.67	5.00	3.00	5.00	6.00	3.00	25.33
OIN-21	2.33	6.67	4.00	6.67	7.33	4.67	23.00
OIN-34	5.33	5.00	8.67	6.33	9.67	2.67	26.33
OIN-35	2.67	7.00	4.00	7.67	7.00	4.00	24.67
OIN-53	5.00	8.00	7.00	7.67	8.33	2.33	31.40
OIN-61	2.67	7.33	4.00	8.00	5.00	4.67	24.67
OIN-67	3.67	5.33	4.33	7.00	7.00	3.67	24.33
OIJ-08	4.33	7.67	5.33	7.67	6.00	4.33	24.67
OIN-10	7.33	11.00	7.00	11.67	10.00	5.67	19.73
JRO 2407+	2.00	7.67	3.67	8.33	4.67	4.00	23.67
$CD_{(P=0.05)}$	1.70	2.63	2.38	2.63	2.50	1.79	5.07

+: check variety

Table 3.44 Infestation and damage of yellow mite in *olitorius* jute germplasms at Coochbehar, West Bengal

Germplasm	Yellow mite (No./cm²)	Plant damage (%) 60 DAS	Plant damage (%) 70 DAS	Yield (q/ha)
OIN-10	3.01	6.67	2.00	15.85
OIN-11	1.87	3.67	0.00	16.75
OIN-14	1.40	3.00	0.00	16.80
OIN-16	2.43	5.33	0.00	16.15
OIN-19	4.11	9.00	3.33	14.40
OIN-21	2.84	6.33	0.00	15.70
OIN-34	3.90	7.67	2.67	14.75
OIN-35	4.23	9.33	4.00	13.90
OIN-53	4.03	8.67	3.67	14.30
OIN-61	3.94	8.33	3.00	14.25
OIN-67	3.20	7.33	2.33	15.60
OIJ-08	3.07	7.00	2.33	16.05
JRO 2407+	4.29	10.67	4.33	14.00

+: check variety

NP(JE) 6.7: Evaluation of elite *C. olitorius* jute genotypes against nematode infestation under pot condition

The trial was allotted to Coochbehar centre and the results are presented below:

Coochbehar: Fourteen (14) *olitorious* accessions were screened against root knot nematode (*Meloidogyne incognita*) in pot condition. The result was estimated on basis of numbers of gall in root and root gall index scale (1-5). Out

of 16 genotypes of jute screened none were found immune or resistant against *M. incognita* (Pundibari isolate race-5). Five genotypes (OIN-05, OIN-13, OIN-154 & OIN-853) were found as moderately resistant with few galls and eggs in the root system. Two germplasm (OIN-651 & OIN-125) were highly susceptible and seven were susceptible in reaction (table 3.45).

Table 3.45 Evaluation of elite *olitorius* jute germplasms against nematode infestation under pot condition at Coochbehar, West Bengal

Germplasm	Average gall/plant	Root Gall Index	Reaction
OIN-02	27.00	3.33	S
OIN-04	59.00	4.00	S
OIN-05	15.00	2.67	MR
OIN-07	49.33	3.67	S
OIN-13	23.67	3.00	MR
OIN-14	43.00	3.67	S
OIN-16	84.67	4.00	S
OIN-21	24.33	3.33	S
OIN-27	34.33	3.67	S
OIN-64	24.00	3.33	S
OIN-125	113.00	4.67	HS
OIN-154	24.33	3.00	MR
OIN-651	153.00	5.00	HS
OIN-853	16.00	2.67	MR

+: check variety; HS: highly susceptible, S: susceptible, MR: moderately resistant

NP(JP) 2.7 Field evaluation of fungicides against foot and stem rot of mesta

The trial was allotted to Katihar and Amadalavalsa centres and the centre-wise results are presented below:

Katihar: The experimental trial was failed due to incessant rainfall and thereafter water logging since July. One replication was completely failed while data were recorded in two replications at the time of harvesting. The experimental trial was inundated for three months so that data recorded at the time of harvesting may not represent true picture.

Amadalavalasa: This is *rabi* season experiment and the results will be sent in next year

NP(SP) 2.8 Standardization of disease free sunnhemp seed production technology in important sunnhemp growing states

The trial was allotted to Barrackpore, Amadalavalasa, Bamra and Pratapgarh centres and the centre-wise results are presented below:

Barrackpore: The trial is in progress and the results will be submitted in next year.

Amadalavalasa: The trial is in progress and the results will be submitted in next year.

Pratapgarh: Experiment will be conducted in this cropping season and the results will be sent in next year.

NP(JB) 5.52: Recording of insect pests and diseases in Advanced Varietal Trial - I in capsularis jute at Barrackpore during, 2020

Barrackpore: Total six AVT-I *capsularis* entries (comprising of two checks) were evaluated against insect pests *viz.*, yellow mite, stem weevil; diseases stem rot and yellow mosaic (table 3.46). No significant difference was observed among the varieties evaluated against insect pest infestation and disease incidence. There was no incidence of hairy caterpillar, grey weevil semilooper and mealybug.

Table 3.46 Relative insect infestation and disease incidence in Advanced Varietal Trials-I in *capsularis* jute at Barrackpore, West Bengal

Treatments	Insect Infestation		Disease Incidence
	Yellow mite (no. of mites/ cm^2)	Stem weevil	Yellow mosaic (%)
V_1-JRCP-7	6.60	6.75	2.50
V_2-JRC-517+	5.95	8.50	1.50
V_3-BRCJ-5	8.55	8.25	1.30
V_5-BCCC-14	8.85	7.75	1.50
V_6-JRC-698+	10.65	8.00	2.30
V_7-JRCP-6	8.30	8.25	2.00
SEm±	2.9	1.81	3.45
$CD_{(P=0.05)}$	NS	NS	NS

NP(JB) 5.53: Recording of insect pests and diseases in Advanced Varietal Trials-II in Capsularis jute at Barrackpore during, 2020

Barrackpore: Total six AVT-II *capsularis* entries (comprising of two checks) were evaluated against insect pests viz., yellow mite, stem weevil; diseases stem rot and yellow mosaic (table 3.47). No significant difference was observed among the varieties evaluated against insect pest infestation and disease incidence. There was no incidence of hairy caterpillar, grey weevil, mealybug and semilooper.

Table 3.47 Relative insect infestation and disease incidence in Advanced Varietal Trials-II in *capsularis* jute at Barrackpore, West Bengal

Treatments	Insect Infestation		Disease Incidence
	Yellow Mite (no. of mites/ cm^2)	Stem Weevil	Yellow Mosaic (%)
V_1-BCCC-9	2.00	6.75	2.25
V_2-BRCJ-1	4.40	6.50	3.25
V_3-JRC-698+	2.10	6.75	2.00
V_4-NCJ-33-9	1.75	8.75	1.50
V_5-JRCP-5	2.00	4.00	1.50
V_6-JRC-517+	23.05	6.00	3.75
SEm±	9.67	2.58	1.79
$CD_{(P=0.05)}$	NS	NS	NS

NP(JB) 5.49: Recording of insect pests and diseases in Advanced Varietal Trials-I in *olitorius* jute at Barrackpore, West Bengal

Barrackpore: Total six AVT-I *olitorius* entries (comprising of two checks) were evaluated against insect pests viz., yellow mite, stem weevil and stem rot disease (table 3.48). No significant difference was observed among the varieties evaluated against insect pest infestation and disease incidence. There was no incidence of hairy caterpillar, grey weevil, mealybug and semilooper. The stem rot disease incidence was <5 (PDI) in all varieties evaluated.

Table 3.48 Relative insect infestation and disease incidence in Advanced Varietal Trials-I in *Olitorius* jute at Barrackpore, West Bengal

Treatments	Insect Infestation (%)		Disease Incidence
	Yellow Mite (no. of mites/ cm^2)	Stem Weevil	Stem Rot (PDI)
V_1-NOJ 15-1	23.55	5.25	1.50
V_2-JROBA-5	14.10	1.25	3.00
V_3-JRO-204+	15.51	4.00	1.25
V_4-BCCO-20	23.75	4.25	1.50
V_5-JRO-524+	18.60	3.50	1.25
V_6-JROP-4	23.40	3.00	1.75
SEm±	6.59	2.51	2.43
$CD_{(P=0.05)}$	NS	NS	NS

NP (JB) 5.50: Recording of insect pests and diseases in Advanced Varietal Trials-II in olitorius jute at Barrackpore, West Bengal

Barrackpore: Total six AVT-II *olitorius* entries (comprising of two checks) were evaluated against insect pests viz., yellow mite, stem weevil and stem rot disease (table 3.49). No significant difference was observed among the varieties evaluated against insect pest infestation and disease incidence. There was no incidence of hairy caterpillar, grey weevil, mealybug and semilooper. The stem rot disease incidence was <5 (PDI) in all varieties evaluated.

Table 3.49. Relative insect infestation and disease incidence in Advanced Varietal Trials-II in *Olitorius* jute at Barrackpore, West Bengal

Treatments	Insect Infestation (%)		Disease Incidence
	Yellow Mite (no. of mites/ cm^2)	Stem Weevil	Stem Rot (PDI)
V_1-JROBA-3	0.40	9.25	3.75
V_2-JRO-524+	0.40	9.50	1.50
V_3-NJ-7082	0.15	10.20	3.25
V_4-JROBA-4	2.90	6.25	4.00
V_5-JRO-204+	0.40	12.75	3.00
V_6-JROP-2	0.65	6.00	2.75
SEm±	2.23	2.20	2.65
$CD_{(P=0.05)}$	NS	NS	NS

NP(SB) 12.79: Studies on incidence of pests in Advanced Varietal Trial-I of *Hibiscus sabdariffa* L. (roselle)

Amadalavalasa: Among the five varieties tested in the AVT-I trial, the V_4 variety recorded low incidence of aphids (0.09/plant), whiteflies (0.03/plant) and mealybug (1.64%). Leafhoppers incidence was low in V_1 variety by recording of 0.31 leafhoppers/plant. Leaf damage by the semilooper was low in both V_4 and V_5 varieties by recording of 25.55 and 25.28 % leaf damage, respectively. However, statistically there was no significant different between the varieties was observed with respect to all the pests (table 3.50).

Table 3.50 Cumulative incidence of insect pests on advanced varieties (AVT-I) of roselle at Amadalavalasa, Andhra Pradesh

Varieties	Cumulative mean incidence*				
	Aphids (number/plant)	Whiteflies (number/plant)	Leaf hoppers (number/plant)	Semilooper damage (%)	Mealybug infestation (%)
V_1- AHS-342	0.12 (0.78)	0.11 (0.78)	0.31 (0.90)	26.95 [31.25]	2.32 [8.62]
V_2-AMV 5+	0.43(0.96)	0.13 (0.79)	0.38 (0.93)	31.24 [33.96]	2.18 [8.41]
V_3 AHS-335	0.26(0.84)	0.29 (0.88)	0.43 (0.96)	30.14 [33.09]	2.14 [8.33]
V_4 BRRM-1	0.09(0.77)	0.03 (0.72)	0.68 (1.08)	25.55 [30.23]	1.64 [7.16]
V_5 HS 4288+	0.41(0.95)	0.16 (0.81)	0.63 (1.06)	25.28 [30.16]	2.15 [8.33]
$CD_{(P=0.05)}$	0.21	0.11	0.16	5.36	1.97
CV(%)	14.25	8.1	9.2	9.71	13.88

+: check variety; **Mean data of insect pests recorded at 30, 60 and 90 DAS;* ***NB:*** *Values in the parenthesis i.e. ( ) and [ ] are square root and arc sine transformed values, respectively*

NP(SB) 12.80: Studies on incidence of pests in Advanced Varietal Trial-II of *Hibiscus sabdariffa* L. (roselle)

Amadalavalasa: Among the five varieties tested in the AVT-II trial, leafhopper incidences was low in V_3 varieties followed by V_2 and V_4 varieties with population of 0.33, 0.42 and 0.53 leafhoppers per plant, respectively and were on par with each other. The roselle V_2 variety recorded low mealybug incidence of 0.98 % followed by V_1 (1.06%) and V_3 (1.08%) varieties and were on par with each other. There is no significant difference was observed among the varieties with respect to aphid, whitefly and semilooper incidence (table 3.51).

Insect pests and disease incidence in AVT-I

Nagaon: Only incidence of root rot revealed significant difference among the entries. Entry V_5 recorded significantly higher root rot incidence than the other five entries. Entries V_1 and V_2 recorded significantly lower incidence of root rot and are at par. Infestation by Bihar hairy caterpillar, semilooper, yellow mite and stem rot was at par among the entries (table 3.52).

Table 3.51. Cumulative mean incidence of insect pests on advanced varieties AVT-II of roselle at Amadalavalasa, Andhra Pradesh

Varieties	Cumulative mean incidence*				
	Aphids (no./plant)	Whiteflies (no./plant)	Leaf hoppers (no./plant)	Semilooper damage (%)	Mealybug infestation (%)
V_1: AHS-310	0.00 (0.71)	0.13 (0.79)	0.52 (1.00)^{ab}	26.39 [30.81]	1.06 [5.82]^{a}
V_2: AHS-307	0.00 (0.71)	0.18 (0.82)	0.42 (0.95)^{a}	23.61 [29.04]	0.98 [5.61]^{a}
V_3: AMV-5+	0.10 (0.77)	0.21 (0.84)	0.33 (0.91)^{a}	23.47 [28.96]	2.13 [8.35]^{b}
V_4: AHS-309	0.08 (0.75)	0.18 (0.83)	0.53 (1.01)^{a}	24.29 [29.49]	1.08 [5.94]^{a}
V_5: HS-4288+	0.20 (0.82)	0.16 (0.81)	0.82 (1.15)^{b}	22.36 [28.17]	1.61 [7.16]^{ab}
F-Test	NS	NS	Sig.	NS	Sig.
$CD_{(P=0.05)}$	0.21	0.13	0.19	3.99	1.79
CV (%)	15.91	9.13	10.60	7.83	15.69

*+: check variety; *Mean data of insect pests recorded at 30, 60 and 90 DAS; NB: Values in the parenthesis i.e. () and [] are square root and arc sine transformed values, respectively*

Table 3.52 Insect pests and disease infestation in *olitorius* AVT-I entries at Nagaon, Assam

Germplasm	Plant damaged (%)			Stem Rot (PDI	Root Rot (%)	Fibre Yield (q/ha)
	Bihar hairy caterpillar	Jute semilooper	Yellow mite			
V_1-NOJ-15-1	18.87 (25.71)	9.62 (18.05)	11.33 (19.54)	2.68 (9.23)	1.11 (5.94)	29.43
V_2-JROBA-5	16.79 (24.11)	9.11 (17.28)	11.33 (19.47)	2.15 (8.40)	1.58 (6.91)	30.85
V_3-JRO-204+	19.21 (25.92)	12.43 (20.59)	15.33 (22.85)	3.45 (10.65)	4.17 (11.73)	27.35
V_4-BCCO-20	19.04 (25.85)	10.98 (19.32)	14.00 (21.83)	3.08 (10.03)	5.27 (13.22)	28.26
V_5-JRO-524+	20.55 (26.92)	13.52 (21.52)	15.33 (22.85)	4.58 (12.30)	12.7 (20.86)	25.98
V_6-JROP-4	17.20 (24.44)	10.46 (18.85)	14.67 (22.11)	3.61 (10.83)	9.4 (10.77)	29.08
$CD_{(P=0.05)}$	NS	NS	NS	NS	2.95	2.71

+: check variety; NB: Data within parentheses are arc sine transformed values

Nagaon: Infestation of Bihar hairy caterpillar, jute semilooper and yellow mite did not differ significantly among the entries. Both stem rot and root rot incidence differs significantly among the entries. Entry V_1, V_4, V_5 and V_6 were at par in respect of stem rot incidence but significantly lower than that of V_2 and V_3. Root rot incidence was at par between entries V_1, V_4 and V_5. Incidence of root rot on $V_1$was significantly lowers than all other varieties (table 3.53).

Insect pests and disease incidence in AVT-II

Table 3.53: Insect pests and disease infestation in *olitorius* AVT-II entries at Nagaon, Assam

Treatment	% Plant damaged by			Stem Rot (PDI)	Root Rot (%)	Fibre Yield (q/ha)
	Bihar hairy caterpillar	Semilooper	Yellow Mite			
V_1-JROBA-3	19.71 (26.23)	12.00 (20.21)	8.00 (16.34)	2.68 (9.39)	1.85 (7.56)	29.76
V_2-JRO-524+	24.10 (29.38)	18.00 (24.92)	5.33 (10.60)	7.85 (16.13)	22.30 (28.09)	25.11
V_3-NJ-7082	20.40 (26.75)	17.33 (24.56)	4.67 (10.19)	6.88 (15.18)	23.33 (28.86)	24.24
V_4-JROBA-4	16.88 (24.21)	14.00 (21.93)	8.67 (16.95)	3.20 (10.27)	2.90 (9.77)	27.18
V_5-JRO-204+	18.09 (25.12)	14.67 (22.11)	4.00 (9.31)	4.25 (11.76)	3.30 (10.28)	27.52
V_6-JROP-2	17.45 (24.61)	16.67 (24.07)	5.33 (10.86)	3.32 (10.36)	4.37 (11.97)	29.91
$CD_{(P=0.05)}$	NS	NS	NS	2.99	3.87	2.99

+: check variety; NB: Data within parentheses are arc sine transformed values

Nagaon: Insect pest and mite infestation was negligible in all the *capsularis* entries and hence, screening against these pests was not practicable. Both stem rot and root rot incidence was at par among the entries (table 3.54).

Table 3.54 Disease infestation in AVT-I germplasm of *capsularis* jute at Nagaon, Assam

Germplasm	Stem Rot (PDI	Root Rot (%)	Fibre Yield (q/ha)
V_1-JRCP-7	5.75 (13.68)	5.84 (13.87)	28.48
V_2-JRC-517+	3.95 (11.33)	4.81 (12.53)	27.94
V_3-BRCJ-5	3.42 (10.46)	9.62 (17.26)	26.22
V_4-BCCC-14	7.17 (15.28)	10.51 (18.86)	26.96
V_5-JRC-698+	5.58 (13.57)	7.88 (16.24)	25.76
V_6-JRCP-6	4.25 (11.74)	7.13 (15.42)	26.32
$CD_{(P=0.05)}$	NS	NS	NS

+: check variety; NB: Data within parentheses are arc sine transformed values

Nagaon: Insect pest and mite infestation was negligible in all the *capsularis* entries and hence, screening against these pests was not practicable. Significant variation among the entries was recorded only in regards to root rot incidence. Entries V3 and V4 recorded significantly higher incidence of root rot than the other entries. Entries V1, V2, V5 and V6 were at par in their response to root rot incidence (table 3.55).

Table 3.55 Disease incidence in AVT-II germplasm of *capsularis* jute at Nagaon, Assam

Entries	Stem Rot (PDI	Root Rot (%)	Fibre yield (q/ha)
V_1-BCCC-9	4.83 (12.59)	5.91 (13.99)	27.42
V_2-BRCJ-1	5.81 (13.87)	5.61 (13.46)	26.85
V_3-JRC-698+	5.00 (12.91)	11.13 (19.37)	25.86
V_4-NCJ-33-9	4.67 (12.40)	12.40 (20.44)	24.73
V_5-JRCP-5	3.53 (10.61)	5.54 (13.54)	27.35
V_6-JRC-517+	3.83 (10.84)	5.05 (12.86)	26.94
$CD_{(P=0.05)}$	NS	4.75	NS

+: check variety; NB: Data within parentheses are arc sine transformed values

NP (JB) 5.52: Studies on incidence of diseases in AVT-I *C. capsularis* jute

Katihar: Total six AVT-I *C.capsularis* entries were evaluated against stem rot and root rot. The root rot was recorded highest in entry V_6 (9.67 %) while lowest disease incidence was reported in V_1 (3.24 %) and V_4 (5.88 %). All entries showed PDI less than 5.0. The stem rot was also reported high in entry V_3 (3.29 PDI) while lowest PDI reported in V_1 (1.79) and V_4 (1.89) (table 3.56).

Table 3.56 Disease incidence in AVT-I with *capsularis* jute at Katihar, Bihar

Entry	Root rot (DI %)	Stem Rot (PDI)
V_1-JRCP-7	3.24	1.79
V_2-JRC 517+	7.18	2.07
V_3-BRCJ-5	9.08	3.29
V_4-BCCC-14	5.88	1.89
V_5-JRC 698+	8.67	2.51
V_6-JRCP-6	9.67	2.23
SEm±	0.82	0.23
$CD_{(P=0.05)}$	2.51	0.71
CV(%)	22.6	20.36

+: check variety

NP (JB) 5.53: Studies on incidence of diseases in AVT- II with *C. capsularis* jute

Katihar: Total six AVT- II *C. capsularis* jute entries were evaluated against stem rot and root rot at JRS, Katihar. The disease incidence of root rot varied from less than one percent to 5.38 %. The root rot was recorded highest in entry V_1 with 5.38% while lowest incidence recorded in V5 (0.51%) and V_3 (0.73%).The incidence of stem rot was insignificant in all entries (table 3.57).

Table 3.57 Studies on incidence of diseases in AVT- II with *capsularis* jute at Katihar, Bihar

Entry	Root rot (DI %)
V_1-BCCC-9	5.38
V_2-BRCJ-1	3.95
V_3-JRC-698+	0.73
V_4-NCJ-33-9	1.58
V_5-JRCP-5	0.51
V_6-JRC-517+	1.71
SEm±	0.24
$CD_{(P=0.05)}$	0.73
CV(%)	20.7

+: check variety

NP (JB) 5.49 Studies on incidence of diseases in AVT-I with *C. olitorius* jute

Katihar: Total six AVT-I *C. olitorius* entries were evaluated against stem and root rot. All entries showed DI less than 10.0%. The root rot was recorded highest in entry V_1 (6.79%) while lowest disease incidence reported in V_3

(1.96 %). All entries showed PDI less than 5.0. The stem rot was also recorded high in entry V_1 (3.14 PDI) while lowest PDI reported in V_3 (0.63) and V_6 (0.89) (table 3.58).

Table 3.58 Disease incidence in AVT-I with *olitorius* jute at Katihar, Bihar

Entries	Root rot (DI %)	Stem Rot (PDI)
V_1-NOJ-15-1	6.79	3.14
V_2-JROBA-5	3.44	2.04
V_3-JRO-204+	1.96	0.63
V_4-BCCO-20	3.46	1.45
V_5-JRO-524+	4.33	1.06
V_6-JROP-4	2.20	0.89
SEm±	0.39	0.17
$CD_{(P=0.05)}$	1.20	0.50
CV(%)	21.4	20.6

+: check variety

Project No NP (JB) 5.50: Studies on incidence of diseases in AVT-II with *olitorius* jute

Katihar: Total six AVT-II *olitorius* entries were evaluated against stem rot and root rot at JRS, Katihar. All entries showed disease incidence and PDI less than 5.0. The root rot was recorded highest in entry V_4 (2.26%) while lowest incidence recorded in V_6 (0.60%). The incidence of stem rot was negligible in all entries (table 3.59).

Table 3.59 Incidence of root rot in AVT-II with *olitorius* jute at Katihar, Bihar

Entry	Root rot (DI %)
V_1: JROBA-3	1.76
V_2: JRO-524+	1.45
V_3: NJ-7082	1.02
V_4: JROBA-4	2.26
V_5: JRO-204+	1.62
V_6: JROP-2	0.60
SEm±	0.15
$CD_{(P=0.05)}$	0.47
CV(%)	21.1

+: check variety

NP (JB) 5.49 Insect pests recording in AVT-I with *C. olitorius olitorius* jute at Katihar, Bihar

Katihar: Total 6 AVT I *Olitorius* entry were evaluated to find out the incidence of major insect-pests attack of yellow mite, Bihar hairy caterpillar and semi-lopper. The maximum number of yellow mite/cm^2 were observed in V_3 18.58 followed by V_4 17.37 55DAS. The Bihar hairy caterpillar maximum infestation observed in V_4 36.75 followed by V_3 31.17 55DAS. The maximum infestation of semi-lopper observed in V_5 (28.97) followed by V_4 (27.34) at 55 DAS (table 3.60).

Table 3.60 Recording of insect pests in AVT-I with *olitorius* jute at Katihar, Bihar

Entry	Insect Damage (%)*								
	Mites			Bihar Hairy Caterpillar			Semilooper		
	35 DAS	45 DAS	55 DAS	35 DAS	45 DAS	55 DAS	35 DAS	45 DAS	55 DAS
V_1:NOJ-15-1	2.05	5.78	10.38	5.14 (12.79)	10.68 (19.06)	15.91 (23.5)	7.90 (16.25)	10.41 (18.75)	15.84 (23.41)
V_2:JROBA-5	2.93	9.84	15.94	8.52 (16.89)	16.26 (23.72)	19.71 (26.27)	10.37 (18.75)	16.17 (23.57)	20.81 (27.13)
V_3: JRO 204+	3.48	10.28	18.58	9.93 (18.33)	20.93 (27.15)	31.17 (33.87)	15.41 (22.97)	14.60 (22.42)	25.03 (29.97)
V_4: BCCO-20	2.51	8.97	17.37	12.65 (20.79)	26.45 (30.82)	36.75 (37.21)	16.14 (23.63)	21.89 (27.86)	27.34 (31.39)
V_5: JRO 524+	4.60	10.18	15.05	10.62 (18.98)	32.79 (34.86)	23.85 (29.13)	16.68 (24.01)	15.18 (22.88)	28.97 (32.47)
V_6: JROP-4	2.36	9.33	13.80	7.87 (16.23)	18.01 (24.94)	22.13 (28.04)	9.65 (18.09)	12.55 (20.64)	17.97 (25.05)
$CD_{(P=0.05)}$	1.18	2.97	4.12	2.75	7.73	8.06	3.73	4.77	6.79
CV(%)	26.31	21.73	18.01	19.99	24.59	21.48	19.50	20.92	19.89

*+: check variety *: Data within parentheses are arc sine transformed value*

NP (JB) 5.50: Recording of insect pests in AVT-II with *olitorius* jute at Katihar

Katihar: Total six (06) AVT II *olitorius* entry were evaluated to find out the incidence of major insect-pests attack of yellow mite, Bihar hairy caterpillar and semi-lopper. The maximum number of yellow mite/cm^2 were observed in V_3 (20.41) followed by V_4 (18.11) at 55 DAS. The maximum infestation of Bihar hairy caterpillar was observed in V_4 (36.75) followed by V_3 (34.26) at 55 DAS. The maximum infestation of semi-lopper was observed in V_4 (25.04) followed by V_3 (23.49) at 55 DAS (table 3.61).

Table 3.61 Recording of insect pests in AVT-II with *olitorius* jute at Katihar, Bihar

Germplasm	Mite Damage			Bihar Hairy Caterpillar Damage %			Semilooper Damage %		
	35 DAS	45 DAS	55 DAS	35 DAS	45 DAS	55 DAS	35 DAS	45 DAS	55 DAS
V_1: JROBA-3	2.62	7.20	9.94	5.39 (13.31)	9.67 (18.11)	15.16 (22.88)	7.50 (15.86)	12.33 (20.5)	11.61 (19.77)
V_2: JRO-524+	3.50	12.29	16.32	8.34 (16.72)	15.52 (23.18)	26.72 (30.88)	9.20 (17.63)	22.97 (28.46)	17.51 (24.7)
V_3: NJ-7082	6.09	13.22	20.41	10.84 (19.18)	21.96 (27.8)	34.26 (35.71)	12.13 (20.31)	33.78 (35.47)	23.49 (28.98)
V_4:JROBA-4	3.84	16.25	18.11	11.3 (19.61)	30.82 (33.68)	36.75 (37.21)	15.25 (22.94)	24.82 (29.83)	25.04 (29.94)
V_5: JRO-204+	5.42	14.42	15.96	10.62 (18.98)	32.79 (34.86)	24.80 (29.81)	14.24 (22.06)	21.75 (27.76)	19.08 (25.81)
V_6: JROP-2	2.43	10.46	12.94	6.94 (15.23)	16.79 (24.1)	19.66 (26.27)	8.68 (17.12)	15.05 (22.79)	15.47 (23.08)
$CD_{(P=0.05)}$	1.36	3.93	4.66	2.14	6.99	9.73	3.48	6.91	5.68
CV (%)	22.65	21.17	19.79	15.94	21.82	24.62	20.71	21.06	20.15

+: check variety; Data within parentheses are arc sine transformed value

NP (JB) 5.52: Recording of insect pests in AVT-I with *capsularis* jute

Katihar: Total 6 AVT I *Capsularis* entry were evaluated to find out the incidence of major insect-pests attack of yellow mite, Bihar hairy caterpillar and semi-lopper. The maximum number of yellow mite/cm^2 was observed in V_5, 29.07 followed by V_3, 27.30 at 55 DAS. The Bihar hairy caterpillar maximum infestation observed in V_6 (32.70) followed by V_5 (32.22) at 55 DAS. The maximum infestation of semi-looper observed in V_4 (28.05) followed by V_5 (26.78) at 55 DAS (table 3.62).

Table 3.62 Recording of insect pests in AVT-I with *capsularis* jute at Katihar, Bihar

Germplasms	YM (mites / cm^2)			Bihar hairy Caterpillar Damage %			Semilooper Damage %		
	35DAS	45DAS	55DAS	35DAS	45DAS	55DAS	35DAS	45DAS	55DAS
V_1:JRCP-7	3.11	17.17	19.18	2.59 (9.14)	12.99 (21.06)	22.36 (28.2)	10.08 (18.47)	18.80 (25.66)	21.69 (27.71)
V_2 : JRC-517+	3.39	20.57	24.85	5.03 (12.84)	13.28 (21.35)	25.35 (30.06)	12.2 (20.4)	22.94 (28.58)	23.21 (28.78)
V_3 : BRCJ-5	5.51	25.10	27.30	4.67 (12.41)	15.96 (23.52)	30.72 (33.62)	9.77 (18.2)	23.07 (28.69)	25.71 (30.4)
V_4: BCCC-14	6.55	25.61	25.07	5.36 (13.29)	16.35 (23.84)	29.51 (32.89)	12.54 (20.74)	23.19 (28.78)	28.05 (31.96)
V_5 : JRC-698+	4.71	24.23	29.07	6.40 (14.57)	17.64 (24.82)	32.22 (34.57)	13.67 (21.64)	22.88 (28.56)	26.78 (31.13)
V_6: JRCP-6	4.56	19.99	21.76	5.61 (13.69)	14.61 (22.44)	32.7 (34.86)	13.63 (21.59)	20.94 (27.23)	21.22 (27.42)
$CD_{(P=0.05)}$	1.59	5.70	5.66	1.94	2.78	6.19	2.90	2.91	4.68
CV (%)	22.71	17.12	15.32	26.03	12.20	14.26	16.10	8.80	12.71

+*: check variety;* Data within parentheses are arc sine transformed value ; +*: check variety*

Katihar: Total 6 AVT-II *Capsularis* entry were evaluated to find out the incidence of major insect-pests attack of yellow mite, Bihar hairy caterpillar and semilooper. The maximum number of yellow mite/cm^2 were observed in V_4 32.12 followed by V4 31.73 55DAS.The Bihar hairy caterpillar maximum infestation observed in V4 33.50 followed by V5 30.65 55DAS. The maximum infestation of semi-lopper observed in V3 27.61followed by V4 26.19 55DAS (table 3.63).

Table 3.63 Recording of insect pests in AVT-II with *capsularis* jute at Katihar, Bihar

Entry	Mites Damage			Bihar Hairy Caterpillar Damage %			Semilooper Damage %		
	35DAS	45DAS	55DAS	35DAS	45DAS	55DAS	35DAS	45DAS	55DAS
V_1: BCCC-9	3.71	12.42	21.77	4.41 (12.09)	16.43 (23.85)	22.29 (28.14)	8.59 (16.99)	14.32 (22.17)	20.76 (27.1)
V_2 : BRCJ-1	3.33	16.19	28.04	5.95 (14.08)	20.74 (27.03)	25.71 (30.45)	9.17 (17.62)	19.37 (26.1)	23.39 (28.89)
V_3 : JRC-698+	4.61	18.68	30.21	7.04 (15.33)	19.82 (26.43)	28.93 (32.49)	9.96 (18.39)	15.94 (23.45)	27.61 (31.66)
V_4: NCJ-33-9	6.13	17.85	32.12	6.93 (15.14)	21.08 (27.31)	33.50 (35.35)	12.01 (20.25)	17.80 (24.95)	26.19 (30.73)
V_5 : JRCP-5	6.62	16.71	31.73	7.75 (16.12)	19.93 (26.5)	30.65 (33.5)	10.92 (19.28)	18.93 (25.78)	23.01 (28.57)
V_6: JRC-517+	6.41	16.77	25.31	6.47 (14.71)	18.09 (25.14)	28.33 (32.12)	9.23 (17.68)	16.50 (23.95)	20.62 (26.97)
$CD_{(P=0.05)}$	2.13	3.76	6.47	1.87	3.04	5.81	1.71	3.20	4.89
CV (%)	27.50	15.20	15.23	19.33	10.44	13.66	11.35	12.40	13.75

+*: check variety*

Data within parentheses are arc sine transformed value;

Kendrapara: Among the IET with *olitorius* entries, highest stem rot incidence was observed in V_1 (14.00%) followed by V_5 (12.00%) and V_{14} (7.67%) and least disease incidence was observed in V_2, V_3, V_{10}, V_{12} and V_{16} entries (1.33%, 1.00%, 1.33%, 1.3%3 & 1.00%). In V_4, V_6, V_7, V_8, V_9, V_{11}, V_{13}, V_{15}, V_{17} and V_{18} (3.67%, 3.33%, 2.33%, 2.67%, 2.00%, 3.00%, 3.00%, 2.00%, 4.67% & 3.67 %) (table 3.64).

Table 3.64 Stem rot incidence (%) in *olitorius* jute (IET) at Kendrapara, Odisha

Entries	Stem rot incidence (%) 90DAS	Entries	Stem rot incidence (%) 90DAS
V_1: NJ-7020	14.00	V_{10}: JROP-7	1.33
V_2: UBOJ-1	1.33	V_{11}: JROBA-7	3.00
V_3: JRO-204+	1.00	V_{12}: JROCS-19-2	1.33
V_4: BROJ-1	3.67	V_{13}: BCCO-22	3.00
V_5: JROP-6	12.00	V_{14}: JROBA-6	7.67
V_6: JRO-524+	3.33	V_{15}: JROCS-19-1	2.00
V_7: BROJ-2	2.33	V_{16}: RHRJ-2	1.00
V_8: NJ-7068	2.67	V_{17}: NOJ-17-2	4.67
V_9: RHRJ-1	2.00	V_{18}: BCCO-24	3.67
$CD_{(P=0.05)}$	1.71	---	---

+: check variety

NP JB 5.49. Evaluation of *olitorius* jute germplasm in AVT-I against jute diseases at Kendrapara centre

Kendrapara: Among the AVT-I entries, the extent of disease incidence recorded varied from 8.67% to 16.00%. The entriesV4 recorded less incidence of stem rot disease (8.67%) whereas the entries V5 (16%) recorded highest disease incidence followed by V2 (14.67%). The entries V1, V3 & V6 recorded moderate incidence of stem rot disease (11.67%, 10.33% &10.00%) (Table 3.65).

Table 3.65 Stem rot incidence (%) in *olitorius* jute (AVT-I) at Kendrapara, Odisha

Entries	Stem rot Incidence (%) at 90 DAS
V_1: NOJ-15-1	11.67
V_2: JROBA-5	14.67
V_3: JRO-204+	10.33
V_4: BCCO-20	8.67
V_5: JRO-524+	16.00
V_6: JROP-4	10.00
$CD_{(P=0.05)}$	2.56

+: check variety

NP (JB) 5.50 Evaluation of *olitorius* jute entries in AVT-II against diseases at Kendrapara centre

Kendrapara: Among the AVT-II entries, the extent of disease incidence varies from 1.67 % to 13.33%. The entries V_1 and V_4 having least incidence of disease (1.67% &2.33%) and V_2 (13.33%) recorded highest disease incidence followed by V_3 (10.00%). Entries V_5 and V_6 had disease incidence of 9.00% and 6.33% (table 3.66).

Table 3.66 Stem rot incidence (%) in AVT-II with *olitorius* jute at Kendrapara, Odisha

Germplasms	Stem rot incidence (%) 90DAS
V_1: JROBA-3	1.67
V_2: JRO-524+	13.33
V_3: NJ-7082	10.00
V_4: JROBA-4	2.33
V_5: JRO-204+	9.00
V_6: JROP-2	6.33
$CD_{(P=0.05)}$	1.83

+: check variety

NP(JB) 5.51: Evaluation of Capsularis Jute in IET against disease at Kendrapara centre

Kendrapara: Among IET with capsularis entries, V1 &V7 were free from disease incidence. Highest disease incidence was observed in V10 (10.67%) followed by V9 (7.00%). Least disease incidence was observed in V2 (1.00%), V3 (1.33%), V4 (1.00%) & V8 (1.33%) (Table 3.67).

Table 3.67 Stem rot incidence (%) in IET with *capsularis* jute at Kendrapara, Odisha

Entry	Stem rot incidence (%)90DAS
V_1: JRCJ-19	0.00
V_2: NCJ-16-53-1	1.00
V_3: UBCJ-2	1.33
V_4: JRC-517+	1.00
V_5: JRCP-9	5.00
V_6: BCCC-16	4.00
V_7: JRCJ-18	0.00
V_8: JRC-698+	1.33
V_9: BCCC-17	7.00
V_{10}: JRCP-8	10.67
$CD_{(P=0.05)}$	1.03

+: check variety

NP (JB) 5.52: Evaluation of capularis jute entries in AVT-I against diseases at Kendrapara centre

Kendrapara: Among the AVT-I entries in capsularis, the extent of disease incidence varies from 7.24 % to 14.07%. The entries V_5, V_1 and V_4 having moderate incidence of disease (7.24%, 8.35% & 8.87%) and V_3 (14.07%) recorded highest disease incidence followed by V_6 entry (12.67%). Entry V_2 had disease incidence of 10.93% (table 3.68).

Table 3.68 Stem rot incidence (%) in AVT-I with *capsularis* jute at Kendrapara, Odisha

Germplasm	Stem rot incidence (%) at 90 DAS
V_1: JRCP-7	8.35
V_2 :JRC-517+	10.93
V_3 :BRCJ-5	14.07
V_4 :BCCC-14	8.87
V_5 : JRC-698+	7.24
V_6 : JRCP-6	12.67
$CD_{(P=0.05)}$	2.31

+: check variety

NP (JB) 5.53 Evaluation of capularis jute entries in AVT-II against diseases at Kendrapara centre

Kendrapara: Among the AVT-II entries in capsularis, the extent of disease incidence varies from 1.10 % to 5.52%. The entries V_5,V_6 ,V_4 and V_3 having least incidence of disease (1.10%, 1.26% 2.21% & 2.99%) and V_1 (5.52%) recorded highest disease incidence followed by V_2 (3.70%) (table 3.69).

Table 3.69 Stem rot incidence (%) in AVT-II with *capsularis* jute at Kendrapara, Odisha

Entries	Stem rot incidence (%) 90 DAS
V_1 : BCCC-9	5.52
V_2 : BRCJ-1	3.70
V_3 : JRC-698+	2.99
V_4 : VNCJ-33-9	2.21
V_5 : JRCP-5	1.10
V_6 : 517+	1.26
$CD_{(P=0.05)}$	1.19

+: check variety

NP (JB) 5.49: Record of disease incidence in AVT-I with *olitorius* jute

Coochbehar: All the four entries including two checks were analyzed on the basis of stem rot and root rot at 15 days interval. At 90 DAS maximum stem rot severity was observed in V_4 (23.42%) which is statistically at par with V_5 (22.13%) and V_1 (21.53%). Minimum stem rot was observed in V_6 (11.26%) followed by V_3 (12.11) and V_2 (15.13%). In case of root rot incidence maximum disease was observed in V_4 (25.28%) followed by V_1 (24.64%), V_5 (23.36%), V_2 (16.38%), V_3 (14.18) and V_6 (11.93%) (table 3.70).

Table 3.70 Evaluation of *olitorius* jute in AVT-I at Coochbehar, West Bengal

Entries	Stem rot (PDI)			Root rot (%)
	60 DAS	75 DAS	90 DAS	90 DAS
V_1 : NOJ-15-1	8.32	15.31	21.53	24.64
V_2 :JROBA-5	3.46	8.23	15.13	16.38
V_3 : JRO-204+	2.16	6.47	12.11	14.18
V_4 : BCCO-20	10.31	16.89	23.42	25.28
V_5 : JRO-524+	9.35	15.36	22.13	23.36
V_6 : JROP-4	2.08	5.85	11.26	11.93

+: check variety

NP (JB) 5.50: Record of disease in AVT-II with *olitorius* jute

Coochbehar: All the four entries including two checks were assessed on the basis of stem rot and root rot at 15 days interval. At 90 DAS maximum stem rot severity was observed in V_6 (41.53%) which is statistically at par with V_5 (40.96%). Minimum stem rot was observed in V_4 (16.73%) followed by V_1 (17.45%) and V_2 (19.36%). In case of root rot incidence maximum disease was observed in V_5 (45.12%) followed by V_6 (42.62%), V_3 (24.56%), V_2 (23.46%), V_1 (19.25%) and V_4 (17.48%) entries (table 3.71).

Table 3.71 Evaluation of *olitorius* jute in AVT-II at Coochbehar, West Bengal

Entries	Stem rot (PDI)			Root rot (%)
	60 DAS	75 DAS	90 DAS	90 DAS
V_1 : JROBA-3	4.65	9.85	17.45	19.25
V_2 : JRO-524+	8.13	14.61	19.36	23.46
V_3 : NJ-7082	9.89	16.55	21.45	24.56
V_4 : JROBA-4	3.25	10.18	16.73	17.48
V_5: JRO-204+	10.56	25.78	40.96	45.12
V_6 : JROP-2	11.12	27.59	41.53	42.62

+: check variety

NP (JB) 5.52: Recording of incidence of diseases in AVT-I with *capsularis* jute

Coochbehar: All the four entries including two checks were analyzed on the basis of stem rot and root rot at 15 days interval. At 90DAS maximum stem rot severity was observed in V_4 (17.16%) which is statistically at par with V_2 (16.13%) and V_1 (10.12%). Minimum stem rot was observed in V_5 (7.23%) followed by V_6 (7.56%) and V_3 (8.42%). In case of root rot incidence maximum disease was observed in V_2 (23.16%) followed by V_4 (19.12%), V_1 (14.65%), V_3 (12.36%), V_6 (10.18%) and V_5 (8.43%) (table 3.72).

Table 3.72 Evaluation of AVT-I *capsularis* jute against stem rot and root rot at Coochbehar, West Bengal

Entries	Stem rot (PDI)			Root rot (%)
	60 DAS	75DAS	90 DAS	90 DAS
V_1 :JRCP-7	1.64	4.35	10.12	14.65
V_2 : JRC-517+	5.24	12.32	16.13	23.16
V_3 : BRCJ-5	1.36	3.58	8.42	12.36
V_4 : BCCC-14	4.13	11.56	17.16	19.12
V_5 :JRC-698+	1.21	4.16	7.23	8.43
V_6 : JRCP-6	1.15	3.25	7.56	10.18

+: check variety

NP (JB) 5.53: Evaluation of *capsularis* jute in AVT-II against diseases

Coochbehar: All the four entries including two checks were assessed on the basis of stem rot and root rot at 15 days interval. At 90 DAS maximum stem rot severity was observed in V_6 (18.56%) which is statistically at par with V_5 (17.21%). Minimum stem rot was observed in V_4 (5.41%) followed by V_3 (6.46%) and V_2 (7.41%). In case of root rot incidence maximum disease was observed in V_6 (26.93%) followed by V_5 (24.31%), V_1 (18.33%), V_4 (9.12%), V_3 (8.83%) and V_2 (7.96%) (table 3.73).

Table 3.73 Evaluation of AVT-II *capsularis* jute at Coochbehar, West Bengal

Entries	Stem rot (PDI)			Root rot (%)
	60 DAS	75 DAS	90 DAS	90 DAS
V_1 : BCCC-9	5.31	9.45	15.31	18.33
V_2 : BRCJ-1	2.31	5.16	7.41	7.96
V_3 : JRC-698+	1.43	4.18	6.46	8.83
V_4 : NCJ-33-9	1.23	3.25	5.41	9.12
V_5 : JRCP-5	6.26	11.36	17.21	24.31
V_6 : 517+	7.53	12.21	18.56	26.93

+: check variety

NP (JB) 5.49: Record of insect pests in AVT-I of *olitorius* jute

Coochbehar: All the four entries including two checks were evaluated against insect pests at 15 days interval. The yellow mite, semilooper and bihar hairy caterpillar were the major insect pests observed during data recording. The yellow mite (no. of mite/cm^2 area of second unfold leaf) and semilooper (%) infestation was maximum at 45 DAS with minimum yellow mite population in V_2 (2.70 mite/cm^2) & minimum semilooper infestation in V_3 (2.61%). In case of Bihar hairy caterpillar, higher percentage of damage was recorded in V_6 (7.02%) and lower caterpillar damage was noticed in V_2 (4.0%) (table 3.74).

Table 3.74 Evaluation of *olitorius* jute against insect pests in AVT-I at Coochbehar, West Bengal

Entries	Yellow Mite (No./cm² of 2nd unfold leaf)	Semilooper (% infestation)	Bihar Hairy Caterpillar (% infestation)
V_1 : NOJ-15-1	3.31	4.51	6.74
V_2 : JROBA-5	2.70	3.58	4.00
V_3 : JRO-204+	2.88	2.61	5.27
V_4 : BCCO-20	3.79	5.52	5.48
V_5 : JRO-524+	4.02	5.14	6.05
V_6 : JROP-4	3.61	4.13	7.02

+: check variety

NP (JB) 5.50: Record of insect pests in AVT-II of *olitorius* jute

Coochbehar: Six *olitorius* entries were evaluated against insect pests at 15 days interval. Yellow mite, semilooper and Bihar hairy caterpillar were the major insect pests observed during data recording. The yellow mite (no. of mite/cm² area of second unfold leaf) and semilooper (%) infestation was maximum at 45 DAS with minimum yellow mite population in V_4 (2.10 mite/cm²) & minimum semilooper infestation in V_1 (3.05%). In case of Bihar hairy caterpillar, higher percentage of damage was recorded in V_3 (8.24%) and lower caterpillar damage was noticed in V_4 (4.10%) (table 3.75).

Table 3.73 Evaluation of *olitorius* jute against insect pests in AVT-II at Coochbehar, West Bengal

Entries	Yellow Mite (No. /cm² of 2nd unfold leaf)	Semilooper (% infestation)	Bihar Hairy Caterpillar (% infestation)
V_1 : JROBA-3	2.25	3.05	5.09
V_2 : JRO-524+	4.20	4.13	5.85
V_3 : NJ-7082	3.53	5.41	8.24
V_4 : JROBA-4	2.10	3.24	4.10
V_5 :JRO-204+	3.93	6.25	7.82
V_6 : JROP-2	4.01	5.28	5.40

+: check variety

NP (JB) 5.52: Evaluation of *C. capsularis* jute of AVT- I in Coochbehar

Coochbehar: All the four entries including two checks were evaluated against insect pests at 15 days interval. The yellow mite, semilooper and Bihar hairy caterpillar were the major insect pests observed during data recording. Among the germplasms, minimum incidence of yellow mite and semilooper were recorded in the entry V_3 with 1.80 mite/cm² and 3.08 % damage respectively. In case of Bihar hairy caterpillar, higher percentage of damage was recorded in V_4 (9.23%) and comparatively lower caterpillar damage was noticed in V_1 (4.16%) (table 3.76).

Table 3.76 Evaluation of AVT-I *capsularis* jute against insect pests at Coochbehar, West Bengal

Entries	Yellow Mite (No./cm² of 2nd unfold leaf)	Semilooper (% infestation)	Bihar Hairy Caterpillar (% infestation)
V_1 :JRCP-7	2.08	4.13	4.16
V_2 : JRC-517+	3.68	5.72	6.84
V_3 : BRCJ-5	1.80	3.08	4.71
V_4 : BCCC-14	3.97	5.34	9.23
V_5 : JRC-698+	2.74	4.95	5.08
V_6 : JRCP-6	3.89	3.69	5.61

+: check variety

NP (JB) 5.53: Evaluation of insect pests in AVT-II of *C. capsularis* jute

Coochbehar: All the six entries (including checks) were evaluated against insect pests at 15 days interval. Yellow mite, semilooper and Bihar hairy caterpillar were the major insect pests observed during data recording. Among the germplasms, yellow mite population (number/sq. cm of 2nd unfold leaf) and semilooper (%) infestation were noticed minimum in V_3 (1.58 mite/cm^2) & V_4 (3.13%) respectively. In case of Bihar hairy caterpillar, maximum damage was observed at 60 days after sowing with higher percentage of damage recorded in V_6 (7.25%) and lower caterpillar damage noticed in V_2 (4.28%) (table 3.77).

Table 3.77 Evaluation insect pests in AVT-II of *capsularis* jute at Coochbehar, West Bengal

Entries	Yellow Mite (No./cm^2 of 2nd unfold leaf)	Semilooper (% infestation)	Bihar Hairy caterpillar (% infestation)
V_1 : BCCC-9	4.02	4.17	6.44
V_1 : BRCJ-1	2.58	4.10	4.28
V_1 : 698+	1.58	4.06	4.75
V_1 : NCJ-33-9	1.99	3.13	5.03
V_1 : JRCP-5	3.31	5.03	5.07
V_1 : JRC-517+	2.29	4.34	7.25

+: check variety

Fibre Quality

Fibre Quality 2020-21

Fibre quality of different entries of jute and allied fibre crops under AINPJAF multi-location evaluation trials conducted during 2020-21 was evaluated at Quality Control Centre under AINPJAF at ICAR-National Institute of Natural Fibre Engineering and Technology, Kolkata using standard protocols. The results are being presented below.

NP(JB) 5.48: IET with *C. olitorius* jute

The trial was conducted in five locations, namely Kalyani, Rahuri, Katihar, Coochbehar and Nagaon with eighteen entries. Overall grade varied from TD6 to higher TD4+87%↑(BIS) and TDN4+10%↑to TDN2. Centre wise results are presented table 4.1.

Table 4.1 Fibre quality of entries under IET with *C. olitorius* jute

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Kalyani	NJ-7020	8.7	2.0	21.5	2.8	Fair Average	Heavy Bodied	TD4	TDN2
	UBOJ-1	12.5	>2.0	17.1	2.7	Fair Average	Heavy Bodied	TD6+73%↑	TDN3+30%↑
	JRO 204+	14.6	>2.0	16.8	2.6	Average	Heavy Bodied	TD6+73%↑	TDN3+30%↑
	BROJ-1	7.4	>2.0	16.6	2.8	Average	Heavy Bodied	TD5	TDN3+55%↑
	JROP-6	14.1	>2.0	15.8	2.7	Fair Average	Heavy Bodied	TD6+73%↑	TDN3+30%↑
	JRO 524+	13.8	1.5	15.4	3.0	Fair Average	Heavy Bodied	TD5+33%↑	TDN3+50%↑
	BROJ-2	10.0	2.0	18.3	2.6	Fair Average	Heavy bodied	TD4	TDN3+55%↑
	NJ-7068	9.8	2.0	14.6	3.0	Fair Average	Heavy Bodied	TD5+6%↑	TDN3+10%↑
	PHRJ-1	10.0	1.5	19.8	2.7	Fair Average	Heavy Bodied	TD4+60%↑	TDN3+75%↑
	JROP-7	14.8	>2.0	18.2	2.9	Average	Heavy Bodied	TD5+20%↑	TDN3+30%↑
	JROBA-7	8	>2.0	14.6	3.0	Average	Heavy Bodied	TD5	TDN4+85%↑
	JROCS-19-2	14.8	>2.0	19.5	3.2	Fair Average	Heavy Bodied	TD5+27%↑	TDN3+5%↑
	BCCO-22	11	>2.0	15.6	3.0	Average	Heavy Bodied	TD6+47%↑	TDN3+30%↑
	JROBA-6	11	2.0	17.9	2.8	Fair Average	Heavy Bodied	TD5+47%↑	TDN3+30%↑
	JROCS-19-1	8	>2.0	14.7	3.0	Fairly Good	Heavy Bodied	TD5+13%↑	TDN3+20%↑
	PHRJ-2	5	1.5	17.7	2.8	Fair Average	Heavy Bodied	TD4	TDN3+75%↑
	NOJ-17-2	13	>2.0	18.2	3.2	Fair Average	Heavy Bodied	TD5+60%↑	TDN3+5%↑
	BCCO-24	8	>2.0	19.1	2.9	Fair Average	Heavy Bodied	TD5+80%↑	TDN3+30%↑
Rahuri	NJ-7020	8	2.0	14.9	3.6	Fairly Good	Heavy Bodied	TD4	TDN3+55%↑
	UBOJ-1	10	1.0	12.9	3.1	Fairly Good	Med. Bodied	TD5+87%↑	TDN3+55%↑
	JRO 204+	15	2.0	12.1	3.2	Fair Average	Med. Bodied	TD6+60%↑	TDN4+70%↑
	BROJ-1	15	2.0	16.0	3.8	Fair Average	Med. Bodied	TD6+47%↑	TDN3+15%↑
	JROP-6	25	1.5	18.6	3.6	Fair Average	Heavy Bodied	TD5+53%↑	TDN4+75%↑
	JRO 524+	35	1.5	14.2	3.7	Fairly good	Med. Bodied	TD6+67%↑	TDN4+30%↑
	BROJ-2	25	2.0	15.3	3.1	Fairly Good	Heavy bodied	TD6+40%↑	TDN4+55%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
	NJ-7068	35	>2.0	18.7	3.3	Fair Average	Med. Bodied	TD6+67%↑	TDN4+55%↑
	PHRJ-1	20	2.0	14.3	3.3	Fair Average	Med. Bodied	TD6+13%↑	TDN4+35%↑
	JROP-7	35	1.5	13.3	3.1	Fairly Good	Heavy Bodied	TD5	TDN4+30%↑
	JROBA-7	35	2.0	11.7	3.9	Fair Average	Med. Bodied	TD6	TDN4+10%↑
	JROCS-19-2	8	1.5	12.1	3.8	Fair Average	Med. Bodied	TD5+60%↑	TDN3+15%↑
	BCCO-22	35	2.0	16.9	3.2	Fair Average	Med. Bodied	TD6+13%↑	TDN4+55%↑
	JROBA-6	35	1.0	12.3	4.1	Good	Med. Bodied	TD6+87%↑	TDN4+95%↑
	JROCS-19-1	8	1.5	10.0	3.0	Fairly Good	Med. Bodied	TD5+80%↑	TDN3+40%↑
	PHRJ-2	25	1.0	20.3	3.8	Fairly Good	Med. Bodied	TD5+73%↑	TDN3+65%↑
	NOJ-17-2	35	>2.0	19.0	3.7	Fairly Good	Med. Bodied	TD6+53%↑	TDN4+55%↑
	BCCO-24	35	>2.0	18.3	3.2	Fairly Good	Med. Bodied	TD6+73%↑	TDN4+55%↑
Coochbehar	NJ-7020	35	2.0	17.7	2.9	Fair Average	Med. Bodied	TD6+73%↑	TDN4+70%↑
	UBOJ-1	20	1.0	20.1	2.1	Fairly Good	Heavy Bodied	TD4+33%↑	TDN3+90%↑
	JRO 204+	35	1.5	20.1	2.6	Good	Heavy Bodied	TD4	TDN3+75%↑
	BROJ-1	25	1.5	19.2	2.1	Fairly Good	Heavy Bodied	TD4+60%↑	TDN3
	JROP-6	35	2.0	19.3	2.5	Fairly Good	Heavy Bodied	TD5+27%↑	TDN4+80%↑
	JRO 524+	35	1.5	21.3	2.4	Fairly Good	Heavy Bodied	TD4	TDN3+50%↑
	BROJ-2	25	1.0	20.8	2.2	Fairly Good	Heavy bodied	TD4+33%↑	TDN3+90%↑
	NJ-7068	20	1.0	22.3	2.3	Fairly Good	Heavy Bodied	TD4+40%↑	TDN2+15%↑
	PHRJ-1	25	1.0	22.7	2.0	Fairly Good	Heavy Bodied	TD4+33%↑	TDN3+90%↑
	JROP-7	25	1.0	23.8	2.6	Fairly Good	Heavy Bodied	TD4+47%↑	TDN3+90%↑
	JROBA-7	20	0.5	21.7	2.4	Fairly Good	Med. Bodied	TD4+53%↑	TDN2+30%↑
	JROCS-19-2	25	1.5	21.7	2.5	Fairly Good	Heavy Bodied	TD4	TDN3+50%↑
	BCCO-22	15	1.0	23.2	2.5	Fairly Good	Heavy Bodied	TD4+73%↑	TDN2+50%↑
	JROBA-6	15	0.5	19.8	2.5	Fairly Good	Med. Bodied	TD4+73%↑	TDN2+40%↑
	JROCS-19-1	20	0.5	21.6	2.4	Fairly Good	Heavy Bodied	TD4+67%↑	TDN2+30%↑
	PHRJ-2	15	0.5	19.6	2.3	Fairly Good	Heavy Bodied	TD4+87%↑	TDN2+40%↑
	NOJ-17-2	35	1.0	20.1	2.8	Fairly Good	Heavy Bodied	TD4	TDN3+90%↑
	BCCO-24	35	0.5	19.7	2.3	Fair Average	Heavy Bodied	TD4+33%↑	TDN3+70%↑
Nagaon	NJ-7020	25	1.5	24.1	2.5	Fair Average	Heavy Bodied	TD4+13%↑	TDN3+40%↑
	UBOJ-1	35	>2.0	18.6	3.0	Average	Heavy Bodied	TD6+73%↑	TDN4+70%↑
	JRO 204+	35	1.5	22.1	2.8	Average	Med. Bodied	TD5+53%↑	TDN3+40%↑
	BROJ-1	35	1.5	21.2	2.8	Average	Heavy Bodied	TD5+66%↑	TDN3+40%↑
	JROP-6	25	1.5	20.9	2.6	Fair Average	Heavy Bodied	TD4	TDN3+40%↑
	JRO 524+	20	1.5	21.9	2.5	Fairly Good	Med. Bodied	TD4	TDN3+75%↑
	BROJ-2	35	1.5	19.7	2.9	Fair Average	Heavy bodied	TD5+60%↑	TDN4+90%↑
	NJ-7068	35	2.0	23.1	2.8	Average	Heavy Bodied	TD5	TDN3+20%↑
	PHRJ-1	20	2.0	22.3	2.9	Average	Heavy Bodied	TD5+20%↑	TDN3+45%↑
	JROP-7	10	1.5	22.8	2.6	Fairly Good	Heavy Bodied	TD4+80%↑	TDN2+10%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Nagaon	JROBA-7	35	>2.0	19.0	2.4	Fair Average	Heavy Bodied	TD5	TDN4+70%↑
	JROCS-19-2	35	2.0	23.8	2.8	Average	Heavy Bodied	TD5+20%↑	TDN3+20%↑
	BCCO-22	35	1.5	24.5	2.5	Fair Average	Heavy Bodied	TD4	TDN3+40%↑
	JROBA-6	35	2.0	20.2	2.7	Average	Heavy Bodied	TD5+13%↑	TDN3+20%↑
	JROCS-19-1	35	1.5	23.6	2.4	Fair Average	Heavy Bodied	TD4	TDN3+40%↑
	PHRJ-2	35	>2.0	21.3	2.5	Average	Heavy Bodied	TD5	TDN3+20%↑
	NOJ-17-2	35	2.0	22.4	2.5	Average	Heavy Bodied	TD5+27%↑	TDN4+20%↑
	BCCO-24	35	2.0	22.7	2.5	Average	Heavy Bodied	TD5+27%↑	TDN3+20%↑
Katihar	NJ-7020	20	1.5	16.5	2.1	Average	Med. Bodied	TD5	TDN3+15%↑
	UBOJ-1	20	2.0	14.7	2.4	Fair Average	Med. Bodied	TD6+47%↑	TDN4+50%↑
	JRO 204+	20	0.5	19.8	2.4	Fairly good	Heavy Bodied	TD4+53%↑	TDN3+75%↑
	BROJ-1	20	1.5	20.2	2.4	Fairly good	Med. Bodied	TD5+86%↑	TDN3+20%↑
	JROP-6	20	1.5	18.3	2.5	Fair Average	Med. Bodied	TD5+80%↑	TDN3+15%↑
	JRO 524+	20	1.5	21.9	2.6	Fair Average	Heavy Bodied	TD4	TDN3+65%↑
	BROJ-2	20	1.0	18.4	2.0	Fair Average	Med. Bodied	TD4	TDN3+75%↑
	NJ-7068	20	1.0	16.9	2.3	Fair Average	Med. Bodied	TD5+33%↑	TDN3+55%↑
	PHRJ-1	20	1.0	18.4	2.4	Fair Average	Med. Bodied	TD4	TDN3+55%↑
	JROP-7	20	1.5	19.7	2.5	Average	Med. Bodied	TD5+87%↑	TDN3+15%↑
	JROBA-7	20	1.5	21.4	2.5	Average	Med. Bodied	TD5+87%↑	TDN3+15%↑
	JROCS-19-2	20	1.0	18.3	2.3	Fair Average	Med. Bodied	TD4	TDN3+55%↑
	BCCO-22	20	1.5	18.7	2.6	Fair Average	Med. Bodied	TD5+80%↑	TDN3+15%↑
	JROBA-6	20	1.5	16.9	2.4	Fair Average	Med. Bodied	TD5	TDN3+15%↑
	JROCS-19-1	20	0.5	18.9	2.2	Fairly good	Med. Bodied	TD4+40%↑	TDN2
	PHRJ-2	20	1.5	19.2	2.7	Fairly good	Heavy Bodied	TD4+80%↑	TDN3+25%↑
	NOJ-17-2	20	1.0	21.4	2.3	Average	Med. Bodied	TD4+13%↑	TDN2↑
	BCCO-24	20	1.5	17.9	2.2	Fair Average	Med. Bodied	TD5+80%↑	TDN3+15%↑

+; check variety

Kalyani: Hard root content varied from 8 to 14.7 percent. Fibre tenacity varied from 14.6 to 21.5 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 1.5 to >2.0 percent. The fibre grades varied from TD6↑to TD 4+87%↑ in BIS grading system and TDN4+85% to TDN3+75% in CACP grading system.

Rahuri: Hard root content varied from 8 to 35 percent. Fibre tenacity varied from 10 to 20.3 g/tex. Fineness of the samples was 3.1 to 4.1 tex. Defects varied from 1.0 to >2.0 percent. The fibre grades varied from TD6 to TD4 (BIS) and TDN4+10%↑ to TDN3+55%↑ (CACP).

Coochbehar: Hard root content varied from 15 to 35 percent. Fibre tenacity varied from 17.7 to 23.8 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 0.5 to 2.0 percent. The fibre grades varied from TD6+73%↑ to TD4+87%↑ and TDN3 to TDN2+50%↑.

Nagaon: Hard root content varied from 10 to 35 percent. Fibre tenacity varied from 18.6 to 24.5 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 1.5 to >2.0 percent. The fibre grades varied from TD6+73%↑ to TD4+80%↑ and TDN4+20%↑to TDN3+75%↑.

Katihar: Hard root content was 20 percent. Fibre tenacity varied from 14.7.6 to 21.4 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 0.5 to 2.0 percent. The fibre grades varied from TD6+47%↑ to TD4+80%↑ and TDN4+50%↑ to TDN2↑.

N.B. At Katihar center root was cut from the fibre samples in all the entries.

NP(JB) 5.49: AVT-I with *C. olitorius* jute

The trial was conducted in seven locations, namely Barrackpore, Kalyani, Kendrapara, Rahuri, Katihar, Coochbehar and Nagaon with six entries. Overall grade varied from TD6↑ to TD3+20%↑ and TDN4+50%↑to TDN2+90%↑. Centre wise results are presented in table 4.2.

Table 4.2 Fibre quality of entries under AVT-I with *C. olitorius* jute

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Barrackpore	NOJ-15-1	5	1.5	14.4	3.0	Good	Med. Bodied	TD4	TDN3+65%↑
	JROBA-5	8	2.0	13.9	3.2	Fairly good	Heavy Bodied	TD5+33%↑	TDN3+25%↑
	JRO 204+	8	1.0	18.0	3.0	Good	Heavy Bodied	TD3	TDN2+25%↑
	BCCO-20	5	1.0	19.5	3.1	Good	Med. Bodied	TD3	TDN2+25%↑
	JRO 524+	8	1.0	16.8	3.3	Good	Heavy Bodied	TD4+33%↑	TDN2
	JROP-4	8	1.5	14.1	3.3	Fairly Good	Heavy Bodied	TD4	TDN4+90%↑
Kalyani	NOJ-15-1	12	>2.0	16.4	3.0	Fairly Good	Heavy Bodied	TD6+60%↑	TDN3+40%↑
	JROBA-5	25	1.5	19.8	2.7	Fair Average	Heavy Bodied	TD5+67%↑	TDN4+90%↑
	JRO 204+	15	2.0	18.3	2.7	Fair Average	Heavy Bodied	TD5+47%↑	TDN4+95%↑
	BCCO-20	11	>2.0	21.0	2.8	Average	Heavy Bodied	TD5+33%↑	TDN3+30%↑
	JRO 524+	11.2	2.0	17.8	3.2	Fair Average	Heavy Bodied	TD5+47%↑	TDN3+5%↑
	JROP-4	15	1.0	22.8	3.0	Fairly Good	Heavy Bodied	TD4+53%↑	TDN2
Kendrapara	NOJ-15-1	8	1.0	13.7	2.8	Average	Heavy Bodied	TD4+7%↑	TDN3+80%↑
	JROBA-5	8	0.5	18.3	3.1	Average	Heavy Bodied	TD4+87%↑	TDN2+30%↑
	JRO 204+	5	1.0	17.1	2.7	Average	Heavy Bodied	TD4+40%↑	TDN2+15%↑
	BCCO-20	5	1.0	13.6	2.8	Average	Heavy Bodied	TD4+20%↑	TDN3+55%↑
	JRO 524+	5	1.0	17.1	2.9	Average	Heavy Bodied	TD4+20%↑	TDN2+15%↑
	JROP-4	5	0.5	16.5	3.1	Fair Average	Heavy Bodied	TD4+60%↑	TDN2+30%↑
Nagaon	NOJ-15-1	8	1.0	22.8	2.9	Fair Average	Med. Bodied	TD4+87%↑	TDN2+65%↑
	JROBA-5	10	1.0	21.8	3.3	Fairly Good	Med. Bodied	TD4+73%↑	TDN2+50%↑
	JRO 204+	10	1.5	24.2	3.4	Fair Average	Heavy Bodied	TD4+67%↑	TDN2
	BCCO-20	10	0.5	23.8	3.3	Fairly Good	Med. Bodied	TD3+13%↑	TDN2+90%↑
	JRO 524+	8	1.0	24.3	3.4	Fairly Good	Heavy Bodied	TD3+20 %↑	TDN2+50%↑
	JROP-4	8	1.0	22.5	3.2	Fair Average	Med. Bodied	TD4+87%↑	TDN3+40%↑
Rahuri	NOJ-15-1	20	1.5	16.8	3.4	Good	Heavy Bodied	TD5+20%↑	TDN3+25%↑
	JROBA-5	35	1.0	18.6	3.4	Good	Heavy Bodied	TD4	TDN3+40%↑
	JRO 204+	35	1.5	18.1	3.7	Fairly Good	Med. Bodied	TD5+40%↑	TDN4+75%↑
	BCCO-20	35	2.0	18.4	3.3	Fairly Good	Heavy Bodied	TD6+6%↑	TDN4+55%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Rahuri	JRO 524+	35	1.5	17.8	3.7	Fairly Good	Med. Bodied	TD5+40%↑	TDN4+75%↑
	JROP-4	35	1.5	15.1	4.1	Fairly Good	Med. Bodied	TD6+47%↑	TDN4+75%↑
Coochbehar	NOJ-15-1	10	0.5	22.0	2.1	Fairly Good	Med. Bodied	TD3+20%↑	TDN2+90%↑
	JROBA-5	20	1.0	22.3	2.2	Fairly Good	Med. Bodied	TD4+27%↑	TDN2+15%↑
	JRO 204+	25	1.5	23.2	2.3	Fair Average	Med. Bodied	TD4+87%↑	TDN3+40%↑
	BCCO-20	35	1.0	24.7	2.0	Fairly Good	Heavy Bodied	TD4+40%↑	TDN3+90%↑
	JRO 524+	35	0.5	23.9	1.9	Good	Med. Bodied	TD4+67%↑	TDN2+80%↑
	JROP-4	25	1.0	24.1	2.0	Good	Med. Bodied	TD4+60%↑	TDN2+15%↑
Katihar	NOJ-15-1	20	2.0	19.3	2.6	Fair Average	Heavy Bodied	TD4+33%↑	TDN4+50%↑
	JROBA-5	20	1.5	18.7	2.8	Fairly good	Med. Bodied	TD5+66%↑	TDN3
	JRO 204+	20	1.5	18.6	3.0	Fair Average	Heavy Bodied	TD5+73%↑	TDN3+15%↑
	BCCO-20	20	2.0	17.6	2.9	Fairly good	Med. Bodied	TD5	TDN3
	JRO 524+	20	1.5	18.3	2.8	Fair Average	Med. Bodied	TD5+60%↑	TDN3+15%↑
	JROP-4	20	1.5	18	2.9	Fairly good	Med. Bodied	TD5+66%↑	TDN3+25%↑

+; check variety

Barrackpore: Hard root content varied from 5 to 8 percent. Fibre tenacity varied from 13.9 to 19.5 g/tex. Fineness of the samples was fine in nature. Defects varied from 1.0 to 2.0 percent. The fibre grades varied from TD5+33%↑ to TD3 and TDN4+90%↑to TDN2+25%↑

Kalyani: Hard root content varied from 11 to 25 percent. Fibre tenacity varied from 16.4 to 22.8 g/tex. Fineness of the samples varied from fine to very fine in nature. Defects varied from 1.0 to >2.0 percent. The fibre grades varied from TD6+60%↑ to TD4+53%↑ and TDN4+90%↑to TDN2.

Kendrapara: Hard root content varied from 5 to 8 percent. Fibre tenacity varied from 13.6 to 18.3 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from TD4+7%↑ to TD4+87%↑ and TDN3+55%↑to TDN2+30%↑.

Nagaon: Hard root content varied from 8 to 10 percent. Fibre tenacity varied from 21.8 to 24.3 g/tex. Fineness of the samples was fine in nature. Defects varied from 0.5 to 1.5 percent. The fibre grades varied from TD4+67%↑ to TD3+20 %↑ and TDN3+40%↑to TDN2+90%↑.

Rahuri: Hard root content varied from 20 to 35 percent. Fibre tenacity varied from 15.1 to 18.6 g/tex. Fineness of the samples was fibre well to fibre separated category. Defects varied from 1.0 to 2.0 percent. The fibre grades varied from TD6+6%↑ to TD4 and TDN4+50%↑to TDN3+25%↑.

Coochbehar: Hard root content varied from 10 to 35 percent. Fibre tenacity varied from 22.0 to 24.7 g/tex. Fineness of the samples was fine to very fine in nature. Defects varied from 0.5 to 1.5 percent. The fibre grades varied from TD4+27%↑ to TD3+20%↑ and TDN3+40%↑ to TDN2+90%↑.

Katihar: Hard root content was 20 percent for all centres. Fibre tenacity varied from 17.6 to 19.3 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 1.5 to 2.0 percent. The fibre grades varied from TD5 to TD4+33%↑ and TDN4+50%↑to TDN3+25%↑.

N.B. At Katihar center root was cut from the fibre sample in all the entries.

NP(JB) 5.50: AVT-II with *C. olitorius* jute

The trial was conducted in seven locations, namely Barrackpore, Kalayani, Kendrapara, Rahuri, Katihar, Coochbehar and Nagaon with six entries. Overall grade varied from TD7+73%↑ to TD3+67%↑and TDN4+10%↑to TDN2+90%↑. Centre wise results are presented in table 4.3.

Table 4.3 Fibre quality of entries under AVT-II with *C. olitorius* jute

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Barrackpore	JROBA-3	5	1.0	16.1	3.2	Good	Heavy Bodied	TD4+47%↑	TDN2+25%↑
	JRO 524+	5	1.0	20.9	3.7	Very Good	Heavy Bodied	TD3+53%↑	TDN2+75%↑
	NJ-7082	5	1.0	11.8	2.8	Good	Med. Bodied	TD4+33%↑	TDN2+5%↑
	JROBA-4	5	0.5	18.6	3.5	Good	Med. Bodied	TD3	TDN2+65%↑
	JRO 204+	5	0.5	17.9	2.9	Good	Med. Bodied	TD3+33%↑	TDN2+90%↑
	JROP-2	5	0.5	18.2	2.9	Very Good	Heavy Bodied	TD3+67%↑	TDN2+90%↑
Nagaon	JROBA-3	20	1.5	19.3	3.1	Fair Average	Heavy Bodied	TD5+73%↑	TDN4+90%↑
	JRO 524+	8	1.5	19.1	2.8	Average	Heavy Bodied	TD4+53%↑	TDN3+75%↑
	NJ-7082	8	2.0	16.9	2.7	Fair Average	Med. Bodied	TD5+33%↑	TDN3+55%↑
	JROBA-4	5	1.0	15.8	3.3	Fair Average	Heavy Bodied	TD4+27%↑	TDN3+90%↑
	JRO 204+	15	1.5	17.9	2.6	Fair Average	Heavy Bodied	TD4+27%↑	TDN3+50%↑
	JROP-2	25	1.5	18.1	2.6	Fair Average	Heavy Bodied	TD5+87%↑	TDN4+90%↑
Kalyani	JROBA-3	12	2.0	17.7	2.6	Fair Average	Heavy Bodied	TD5+67%↑	TDN3+30%↑
	JRO 524+	5	2.0	18.4	3.3	Fair Average	Heavy Bodied	TD4+13%↑	TDN3+30%↑
	NJ-7082	5	>2.0	18.9	3.0	Fair Average	Heavy Bodied	TD4	TDN3+55%↑
	JROBA-4	10	2.0	21.1	2.9	Fair Average	Heavy Bodied	TD4	TDN2+5%↑
	JRO 204+	8	>2.0	14.1	2.6	Average	Heavy Bodied	TD5+20%↑	TDN3+10%↑
	JROP-2	5	2.0	16.3	3.2	Fair Average	Heavy Bodied	TD5+40%↑	TDN4+85%↑
Kendrapara	JROBA-3	5	1.0	18.6	3.0	Average	Heavy Bodied	TD4+93%↑	TDN2+15%↑
	JRO 524+	5	1.0	18.9	3.2	Fair Average	Heavy Bodied	TD3	TDN3+90%↑
	NJ-7082	10	1.0	18.1	2.9	Fair average	Heavy Bodied	TD4+73%↑	TDN3+90%↑
	JROBA-4	5	0.5	17.7	3.2	Fair Average	Heavy Bodied	TD3+27%↑	TDN2+30%↑
	JRO 204+	10	1.0	16.3	3.0	Fair Average	Heavy Bodied	TD5+93%↑	TDN3+90%↑
	JROP-2	5	0.5	18.2	3.2	Fair Average	Heavy Bodied	TD3+27%↑	TDN2+30%↑
Rahuri	JROBA-3	BARKY SAMPLE						TD8	TDN5
	JRO 524+	35	2.0	14.5	4.3	Fairly Good	Heavy Bodied	TD6	TDN4+10%↑
	NJ-7082	20	2.0	14.9	3.8	Fairly Good	Med. Bodied	TD6+20%↑	TDN4+35%↑
	JROBA-4	35	>2.0	12.5	4.2	Fair Average	Heavy Bodied	TD7+73%↑	TDN4
	JRO 204+	35	>2.0	14.2	3.7	Fairly Good	Heavy Bodied	TD6	TDN4+10%↑
	JROP-2	35	2.0	16.1	4.2	Fairly Good	Heavy Bodied	TD6	TDN4+55%↑
Coochbehar	JROBA-3	35	2.0	24.3	2.5	Fair Average	Heavy Bodied	TD5+47%↑	TDN3+20%↑
	JRO 524+	20	1.0	22.7	2.1	Good	Med. Bodied	TD4+40%↑	TDN2+40%↑
	NJ-7082	35	2.0	23.8	2.2	Fair Average	Med. Bodied	TD5+33%↑	TDN3+20%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Coochbehar	JROBA-4	15	0.5	20.1	2.2	Fairly Good	Med. Bodied	TD4+73%↑	TDN2+90%↑
	JRO 204+	35	1.0	24.2	1.9	Fairly Good	Heavy Bodied	TD4+40%↑	TDN2+15%↑
	JROP-2	35	1.0	21.9	2.2	Fairly Good	Heavy Bodied	TD4+27%↑	TDN3+90%↑
Katihar	JROBA-3	20	1.5	18.7	2.8	Fairly good	Med. Bodied	TD5+67%↑	TDN3+25%↑
	JRO 524+	20	1.5	18.5	3.0	Fairly good	Med. Bodied	TD5+66%↑	TDN3+25%↑
	NJ-7082	20	1.5	19.2	2.9	Fair Average	Heavy Bodied	TD5+73%↑	TDN3+25%↑
	JROBA-4	20	1.5	17.2	3.1	Average	Med. Bodied	TD6+80%↑	TDN4+90%↑
	JRO 204+	20	1.0	17.6	2.9	Fairly good	Med. Bodied	TD4	TDN3+65%↑
	JROP-2	20	0.5	17.8	2.7	Fair average	Med.Bodied	TD4+33%↑	TDN3+95%↑

+; check variety

Barrackpore: Hard root content was 5 percent in all the entries. Fibre tenacity varied from 11.8 to 20.9 g/tex. Fineness of the samples varied from fine to coarser in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from TD4+33%↑ to TD3+67%↑ and TDN2+5%↑to TDN2+90%↑

Nagaon: Hard root content varied from 8 to 25 percent. Fibre tenacity varied from 15.8 to 19.1 g/tex. Fineness of the samples varied from very fine to fine in nature. Defects varied from 1.0 to 2.0 percent. The fibre grades varied from TD5+33%↑ to TD5+87%↑ and TDN4+90%↑ to TDN3+90%↑

Kalyani: Hard root content varied from 5 to 12 percent. Fibre tenacity varied from 14.1 to 21.1 g/tex. Fineness of the samples was fine in nature. Defects varied from 2.0 to >2.0 percent. The fibre grades varied from TD5+20%↑ to TD4+13%↑ and TDN4+85%↑to TDN2+30%↑.

Kendrapara: Hard root content varied from 5 to 10 percent. Fibre tenacity varied from 16.3 to 18.9 g/tex. Fineness of the samples varied from fine to coarser in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from TD5+93%↑ to TD3+27%↑ and TDN3+90%↑to TDN2+30%↑.

Rahuri: Hard root content varied from 20 to 35 percent. Fibre tenacity varied from 12.5 to 16.1 g/tex. Samples were coarser in nature. Defects varied from 0.5 to 2.0 percent. The fibre grades varied from TD8 to TD6+20%↑ and TDN5 to TDN4+55%↑

Coochbehar: Hard root content varied from 15 to 35 percent. Fibre tenacity varied from 20.1 to 24.3 g/tex. Fineness of the samples was very fine in nature. Defects varied from 0.5 to 2.0 percent. The fibre grades varied from TD5+33%↑ to TD4+73%↑ and TDN3+20%↑to TDN2+90%↑

Katihar: Hard root content was 20 percent for all the samples. Fibre tenacity varied from 17.2 to 19.2 g/tex. Fineness of the entries was fine in nature. Defects varied from 0.5 to 1.5 percent. The fibre grades varied from TD6+80%↑to TD4+33%↑ and TDN4+90%↑ to TDN3+95%↑

N. B. At Katihar center all the root was cutted from the fibre sample in all entries.

NP(JB)-5.51: IET with *C. capsularis* jute

The trial was conducted in four locations, namely Kalyani, Katihar, Coochbehar and Nagaon with ten entries. Overall grade varied from W3 to W5↑. Centre wise results are presented in table 4.4.

Table 4.4 Fibre quality of entries under IET with *C. capsularis* jute

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Coochbehar	JRCJ-19	40	1.0	16.9	1.3	Good	Med. Bodied	W4+27%↑	WN3+90%↑
	NCJ-16-53-1	40	0.5	15.5	1.4	Very Good	Med. Bodied	W4+73%↑	WN2+30%↑
	UBCJ-2	40	0.5	17.0	1.4	Very Good	Med. Bodied	W4+73%↑	WN2+30%↑
	JRC 517+	25	0.5	17.8	1.3	Very Good	Heavy Bodied	W3	WN2+30%↑
	JRCP-9	30	0.5	11.5	1.4	Good	Med. Bodied	W4	WN3+85%↑
	BCCC-16	30	1.0	15.2	1.5	Very Good	Med. Bodied	W4+53%↑	WN3+90%↑
	JRCJ-18	30	0.5	16.6	1.4	Very Good	Heavy Bodied	W3	WN2+30%↑
	JRC 698+	30	0.5	12.9	1.3	Good	Med. Bodied	W4	WN3+85%↑
	BCCC-17	25	0.5	14.7	1.5	Very Good	Med. Bodied	W4+33%↑	WN3+85%↑
	JRCP-8	25	0.5	15.6	1.4	Good	Med. Bodied	W4+67%↑	WN2+30%↑
Nagaon	JRCJ-19	30	1.5	14.1	1.7	Fairly Good	Med. Bodied	W5+40%↑	WN4+80%↑
	NCJ-16-53-1	40	0.5	13.7	2.1	Good	Heavy Bodied	W5+80%↑	WN3+35%↑
	UBCJ-2	20	1.5	14.2	1.7	Good	Heavy Bodied	W4	WN3+5%↑
	JRC 517+	40	1.5	15.8	2.2	Good	Med. Bodied	W5+67%↑	WN3
	JRCP-9	25	1.0	14.6	2.0	Fairly Good	Heavy Bodied	W5+53%↑	WN4+95%↑
	BCCC-16	30	1.0	12.7	1.9	Fairly Good	Heavy Bodied	W5+47%↑	WN4+95%↑
	JRCJ-18	40	0.5	12.3	1.5	Good	Med. Bodied	W4	WN3+60%↑
	JRC 698+	40	1.5	14.2	1.6	Good	Heavy Bodied	W5+60%↑	WN4+80%↑
	BCCC-17	30	1.0	12.6	1.8	Fairly Good	Heavy Bodied	W5+80%↑	WN3+20%↑
	JRCP-8	30	1.0	15.7	2.1	Good	Heavy Bodied	W4+13%↑	WN3+40%↑
Kalyani	JRCJ-19	25	1.5	13.1	1.7	Fair Average	Heavy Bodied	W5+53%↑	WN4+70%↑
	NCJ-16-53-1	25	>2.0	16.0	1.3	Fairly Good	Heavy Bodied	W5+33%↑	WN4+90%↑
	UBCJ-2	25	>2.0	16.3	1.4	Fairly Good	Heavy Bodied	W5+33%↑	WN3+5%↑↑
	JRC 517+	5	2.0	19.4	1.4	Fairly Good	Heavy Bodied	W4+86%↑	WN3+90%↑
	JRCP-9	15	2.0	14.3	1.3	Fairly Good	Heavy Bodied	W5+86%↑	WN3+20%↑
	BCCC-16	40	2.0	20.1	1.5	Fair Average	Heavy Bodied	W5+66%↑	WN3+45%↑
	JRCJ-18	12	1.5	17.5	1.5	Fairly Good	Heavy Bodied	W4+80%↑	WN3+85%↑
	JRC 698+	20	>2.0	15.5	1.4	Fairly Good	Heavy Bodied	W5+67%↑	WN3+30%↑
	BCCC-17	40	>2.0	15.9	1.5	Fairly Good	Heavy Bodied	W5+20%↑	WN3+5%↑
	JRCP-8	8	2.0	11.7	1.2	Fairly Good	Heavy Bodied	W4+7%↑	WN3+45%↑
Katihar	JRCJ-19	25	2.0	13.0	1.3	Average	Med. Bodied	W5	WN4+50%↑
	NCJ-16-53-1	25	2.0	13.2	1.5	Fair Average	Med. Bodied	W5	WN4+55%↑
	UBCJ-2	25	2.0	11.7	1.2	Fair Average	Med. Bodied	W5	WN4+50%↑
	JRC 517+	25	1.5	16.3	1.4	Good	Med. Bodied	W4	WN3+50%↑
	JRCP-9	25	1.0	12.7	1.3	Fairly Good	Med. Bodied	W5+73%↑	WN3+20%↑
	BCCC-16	25	1.0	13.5	1.4	Good	Med. Bodied	W5+87%↑	WN3+45%↑
	JRCJ-18	25	1.5	15.4	1.6	Fair Average	Med. Bodied	W4	WN3+15%↑
	JRC 698+	25	1.0	17.4	1.7	Good	Med. Bodied	W4+40%↑	WN3+90%↑
	BCCC-17	25	>2.0	14.0	1.3	Fair Average	Med. Bodied	W6+60%↑	WN4+50%↑
	JRCP-8	25	1.5	18.1	1.6	Good	Med. Bodied	W4	WN3+50%↑

+; check variety

Coochbehar: Hard root content varied from 25 to 40 percent. Fibre tenacity varied from 11.5 to 16.9 g/tex. All the entries were very fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from W4 to W3 and WN3+85%↑to WN2+30%↑

Nagaon: Hard root content varied from 20 to 40 percent. Fibre tenacity varied from 12.3 to 15.8 g/tex. All the entries were very fine in nature. Defects varied from 0.5 to 1.5 percent. The fibre grades varied from W5+40%↑to W4+13%↑ and WN4+80%↑to WN3+60%↑.

Kalayani: Hard root content varied from 5 to 40 percent. Fibre tenacity varied from 11.7 to 20.1 g/tex. All the entries were very fine in nature. Defects varied from 1.5 to >2.0 percent. The fibre grades varied from W5+20%↑ to W4+86%↑ and WN4+70%↑ to WN3+90%↑.

Katihar: Hard root content was 25 percent in all the entries. Fibre tenacity varied from 11.7 to 18.1 g/tex. All the entries were very fine in nature. Defects varied from 1.0 to >2.0 percent. The fibre grades varied from W6+60%↑ to W4+40%↑ and WN4+55%↑ to WN3+90%↑.

N. B. At Katihar center root was cut from the fibre sample in all the entries

NP (JB) 5.52: AVT-I with *C. capsularis* jute

The trial was conducted in six locations, namely Barrackpore, Kalyani, Kendrapara, Coochbehar, Katihar and Nagaon with six entries. Overall grade varied from W5↑ to W4↑. Centre wise results are presented below in table 4.5.

Table 4.5 Fibre quality of entries under AVT-I with *C. capsularis* jute

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Barrackpore	JRCP-7	20	1.5	20.1	1.9	Good	Heavy Bodied	W4+40%↑	WN2
	JRC 517+	40	2.0	19.1	2.1	Good	Heavy Bodied	W5+53%↑	WN4+80%↑
	BRCJ-5	40	2.0	18.0	2.2	Fairly Good	Heavy Bodied	W5+40%↑	WN4+80%↑
	BCCC-14	30	2.0	17.6	1.5	Fairly Good	Heavy Bodied	W5+67%↑	WN3+5%↑
	JRC 698+	30	1.5	13.3	1.6	Fairly Good	Heavy Bodied	W5+53%↑	WN4+80%↑
	JRCP-6	15	2.0	19.6	2.2	Good	Heavy Bodied	W4+33%↑	WN3+40%↑
Kalyani	JRCP-7	25	2.0	16.1	1.4	Good	Heavy Bodied	W5+87%↑	WN3+5%↑
	JRC 517+	40	>2.0	13.8	1.4	Fair Average	Heavy Bodied	W6+53%↑	WN4+50%↑
	BRCJ-5	40	2.0	16.5	1.5	Fair Average	Heavy Bodied	W5+53%↑	WN4+95%↑
	BCCC-14	40	2.0	11.9	1.4	Good	Heavy Bodied	W5+20%↑	WN4+65%↑
	JRC 698+	40	1.5	11.1	1.6	Fairly Good	Heavy Bodied	W5+47%↑	WN4+80%↑
	JRCP-6	40	2.0	12.9	1.5	Fairly Good	Heavy Bodied	W5	WN4+60%↑
Kendrapara	JRCP-7	25	1.0	8.2	1.3	Good	Heavy Bodied	W4	WN3+45%↑
	JRC 517+	20	1.0	10.1	1.6	Fair Average	Med. Bodied	W4	WN3+35%↑
	BRCJ-5	40	1.0	9.9	1.5	Fair Average	Med. Bodied	W5+53%↑	WN3+10%↑
	BCCC-14	15	1.0	11.2	1.5	Fairly Good	Med. Bodied	W4+40%↑	WN3+80%↑
	JRC 698+	30	1.5	9.4	1.4	Fairly Good	Med. Bodied	W5+40%↑	WN4+80%↑
	JRCP-6	15	1.0	9.7	1.3	Fairly Good	Heavy Bodied	W4+53%↑	WN3+80%↑
Coochbehar	JRCP-7	15	0.5	16.3	1.4	Very Good	Heavy Bodied	W3+67%↑	WN2+90%↑
	JRC 517+	30	0.5	18.3	1.4	Very Good	Heavy Bodied	W3	WN2+30%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade	CACP Grade
Coochbehar	BRCJ-5	40	1.0	16.9	1.5	Fairly Good	Heavy Bodied	W4+27%↑	WN3+65%↑
	BCCC-14	30	1.0	13.3	1.3	Good	Med. Bodied	W5+80%↑	WN3+45%↑
	JRC 698+	20	0.5	15.8	1.3	Very Good	Heavy Bodied	W3+33%↑	WN2+55%↑
	JRCP-6	8	0.5	15.5	1.3	Good	Med. Bodied	W3+53%↑	WN1+15%↑
Nagaon	JRCP-7	30	1.0	15.3	2.2	Fairly Good	Med. Bodied	W5+87%↑	WN3+40%↑
	JRC 517+	40	1.0	19.1	2.3	Fairly Good	Heavy Bodied	W4+7%↑	WN3+40%↑
	BRCJ-5	25	1.0	16.4	1.9	Fair Average	Med. Bodied	W5+87%↑	WN3+30%↑
	BCCC-14	20	1.0	15.6	1.9	Good	Med. Bodied	W4+40%↑	WN3+90%↑
	JRC 698+	40	1.5	17.6	2.0	Fair Average	Heavy Bodied	W5+60%↑	WN4+90%↑
	JRCP-6	40	2.0	20.5	2.1	Fair Average	Heavy Bodied	W5+33%↑	WN3+20%↑
Katihar	JRCP-7	25	1.0	13.0	1.2	Fairly Good	Med. Bodied	W5+73%↑	WN3+20%↑
	JRC 517+	25	0.5	12.7	1.2	Good	Heavy Bodied	W4+27%↑	WN3+85%↑
	BRCJ-5	25	1.0	12.2	1.3	Fairly Good	Med. Bodied	W5+73%↑	WN3+40%↑
	BCCC-14	25	0.5	10.2	1.1	Fair Average	Med. Bodied	W4	WN3+50%↑
	JRC 698+	25	0.5	17.1	1.4	Fair Average	Heavy Bodied	W4+60%↑	WN2
	JRCP-6	25	1.0	11.3	1.3	Fair Average	Med. Bodied	W5+66%↑	WN3+10%↑

+; check variety

Barrackpore: Hard root content varied from 20 to 40 percent. Fibre tenacity varied from 13.3 to 20.1 g/tex. Entries were very fine to fine in nature. Defects varied from 1.5 to 2.0 percent. The fibre grades varied from W5+53%↑ to W4+40%↑ and WN4+80%↑ to WN2.

Kalyani: Hard root content varied from 25 to 40 percent. Fibre tenacity varied from 11.1 to 16.5 g/tex. All the entries were very fine in nature. Defects varied from 1.5 to >2.0 percent. The fibre grades varied from W6+53%↑ to W5+87%↑ and WN4+50%↑to WN3+5%↑ .

Kendrapara: Hard root content varied from 15 to 40 percent. Fibre tenacity varied from 8.2 to 11.2 g/tex. Entries were very fine to fine in nature. Defects varied from 1.0 to 1.5 percent. The fibre grades varied from W5+53%↑ to W3+67%↑ and WN4+80%↑to WN3+80%↑.

Coochbehar: Hard root content varied from 8 to 40 percent. Fibre tenacity varied from 13.3 to 18.3 g/tex . All the entries were very fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from W5+80%↑ to W3+67%↑ and WN3+45%↑to WN1+15%.

Nagaon: Hard root content varied from 20 to 40 percent. Fibre tenacity varied from 15.3 to 20.5 g/tex. All the entries were fine in nature. Defects varied from 1.0 to 2.0 percent. The fibre grades varied from W5+33%↑ to W4+40%↑ and WN4+90%↑ to WN3+30%↑.

Katihar: Hard root content 25 percent in all the entries. Fibre tenacity varied from 10.2 to 17.1 g/tex. All the entries were very fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from W5+66%↑ to W4+60%↑ and WN3+20%↑ to WN2.

N. B. At Katihar center root was cut from the fibre sample in all the entries.

NP(JB) 5.53: AVT-II with *C. capsularis* jute

The trial was conducted in six locations, namely Barrackpore, Kalyani, Kendrapara, Coochbehar, Katihar and Nagaon with six entries. Overall grade varied from W5↑ to W4↑. Centre wise results are presented in table 4.6.

Table 4.6 Fibre quality of entries under AVT-II with *C. capsularis* jute

Centre	Entry	Root Content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS GRADE	CACP grade
Barrackpore	BCCC-9	40	1.5	16.4	2.3	Good	Heavy Bodied	W5+80%↑	WN3
	BRCJ-1	30	>2.0	20.5	2.1	Fair Average	Heavy Bodied	W5	WN3+20%↑
	JRC 698+	40	1.5	13.8	2.0	Fairly Good	Heavy Bodied	W5+20%↑	WN4+55%↑
	NCJ-33-9	25	1.0	13.5	1.9	Fairly Good	Heavy Bodied	W5+53%↑	WN4+95%↑
	JRCP-5	15	1.5	18.9	2.2	Good	Heavy Bodied	W4+73%↑	WN3
	JRC 517+	40	>2.0	15.9	2.0	Fairly Good	Heavy Bodied	W6+87%↑	WN4+80%↑
Kalyani	BCCC-9	25	2.0	14.7	1.7	Fairly Good	Heavy Bodied	W5+33%↑	WN4+60%↑
	BRCJ-1	30	2.0	13.6	1.4	Fair Average	Heavy Bodied	W5	WN4+50%↑
	JRC 698+	40	1.5	14.1	1.4	Fairly Good	Heavy Bodied	W5+47%↑	WN4+80%↑
	NCJ-33-9	30	2.0	16.9	1.3	Good	Heavy Bodied	W5+80%↑	WN3+5%↑
	JRCP-5	8	1.5	10.4	1.3	Fairly Good	Heavy Bodied	W4+47%↑	WN3+65%↑
	JRC 517+	40	2.0	17.5	1.5	Fairly Good	Heavy Bodied	W5+60%↑	WN3+5%↑
Kendrapara	BCCC-9	40	1.5	10.0	1.5	Fairly Good	Med. Bodied	W5+33%↑	WN4+80%↑
	BRCJ-1	40	1.0	9.0	1.7	Good	Med. Bodied	W5+73%↑	WN3+45%↑
	JRC 698+	40	1.5	9.0	1.4	Good	Med. Bodied	W5+47%↑	WN3
	NCJ-33-9	40	0.5	12.8	1.4	Fairly Good	Heavy Bodied	W4	WN3+60%↑
	JRCP-5	25	1.0	14.1	1.6	Fairly Good	Heavy Bodied	W5+87%↑	WN3+20%↑
	JRC 517+	40	0.5	10.2	1.5	Fairly Good	Heavy Bodied	W4	WN3+60%↑
Coochbehar	BCCC-9	30	0.5	14.1	1.4	Good	Heavy Bodied	W4+20%↑	WN3+85%↑
	BRCJ-1	40	1.0	16.4	1.3	Good	Heavy Bodied	W4+40%↑	WN3+90%↑
	JRC 698+	30	0.5	15.3	1.3	Good	Heavy Bodied	W4+73%↑	WN2+30%↑
	NCJ-33-9	40	0.5	17.1	1.3	Good	Heavy Bodied	W4+67%↑	WN2+30%↑
	JRCP-5	25	0.5	14.3	1.3	Fairly Good	Med. Bodied	W4	WN3+60%↑
	JRC 517+	30	0.5	15.4	1.3	Fairly Good	Med. Bodied	W4+47%↑	WN2
Nagaon	BCCC-9	40	1.0	16.1	2.1	Good	Heavy Bodied	W4+7%↑	WN3+65%↑
	BRCJ-1	40	1.5	13.3	2.2	Fairly Good	Med. Bodied	W5	WN4+55%↑
	JRC 698+	30	1.0	18.7	2.1	Fair Average	Heavy Bodied	W4+7%↑	WN3+30%↑
	NCJ-33-9	25	1.0	14.6	1.9	Good	Med. Bodied	W5+53%↑	WN3+20%↑
	JRCP-5	30	1.5	17.9	2.0	Fairly Good	Heavy Bodied	W5+73%↑	WN3
	JRC 517+	30	1.0	16.7	1.7	Fairly Good	Heavy Bodied	W4+17%↑	WN3+65%↑
Katihar	BCCC-9	25	1.0	16.1	1.4	Good	Heavy Bodied	W4+53%↑	WN3+65%↑
	BRCJ-1	25	0.5	17.3	1.7	Good	Heavy Bodied	W4+80%↑	WN2
	JRC 698+	25	1.0	14.3	1.5	Fairly Good	Med. Bodied	W5+73%↑	WN3+20%↑
	NCJ-33-9	25	1.0	16.2	1.6	Fairly Good	Med. Bodied	W4+27%↑	WN3+65%↑
	JRCP-5	25	1.0	14.4	1.5	Fair Average	Med. Bodied	W5+66%↑	WN3+10%↑
	JRC 517+	25	1.0	16.5	1.5	Good	Heavy Bodied	W4+53%↑	WN3+65%↑

+; check variety

Barrackpore: Hard Root content varied from 15 to 40 percent. Fibre tenacity varied from 13.5 to 20.5 g/tex. Entries were fine in nature. Defects varied from 1.0 to > 2.0 percent. The fibre grades varied from W6+87%↑ to W4+73%↑ and WN4+55%↑ to WN3+20%↑.

Kalayani: Hard Root content varied from 8 to 40 percent. Fibre tenacity varied from 10.4 to 17.5 g/tex. All the entries were very fine in nature. Defects varied from 1.5 to 2.0 percent. The fibre grades varied from W5+33%↑ to W4+73%↑ and WN4+50%↑ to WN3+65%↑.

Kendrapara: Hard Root content varied from 25 to 40 percent. Fibre tenacity ranged from 9.0 to 14.1g/tex. Entries were very fine in nature. Defects varied from 0.5 to 1.5 percent. The fibre grades varied from W5+33%↑ to W4 and WN4+80%↑ to WN3+60%↑.

Coochbehar: Hard Root content varied from 25 to 40 percent. Fibre tenacity varied from 14.1 to 17.1 g/tex . All the entries were very fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from W4 to W4+73%↑ and WN3+60%↑to WN2+30%↑.

Nagaon: Hard Root content varied from 25 to 40 percent. Fibre tenacity varied from 13.3 to 18.7 g/tex. All the entries were fine in nature except one entry. Defects varied from 1.0 to 1.5 percent. The fibre grades varied from W5 to W4+17%↑ and WN4+55% to WN3+65%↑.

Katihar: Hard Root content was 25 percent in all the entries. Fibre tenacity varied from 14.3 to 17.3 g/tex. All the entries were very fine in nature. Defects varied from 0.5 to 1.0 percent. The fibre grades varied from W5+66%↑ to W4+80%↑ and WN3+10%↑ to WN3+65%↑.

N. B. At Katihar center root was cut from the fibre sample in all the entries.

NP(CB) 1.49: IET with kenaf (*H. cannabinus*)

The trial was conducted in three locations, namely Rahuri, Amadalavalasa and Aduthurai with seven entries. Overall grade varied from M2 to M4↑. Centre wise results are presented below in table 4.7.

Table 4.7 Fibre quality of entries under IET with kenaf (*H. cannabinus*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Rahuri	JRK-2019-3	12	1.0	22.1	3.7	Fair Average	Med. Bodied	M3+80%↑
	JRK-2019-1	20	2.0	18.2	4.4	Fair Average	Heavy Bodied	M4+70%↑
	HC 583+	20	1.5	20.1	4.3	Fair Average	Med. Bodied	M4+55%↑
	JRK-2019-2	12	1.5	23.7	4.2	Fair Average	Med. Bodied	M3+60%↑
	JRHC-15	20	0.5	16.6	3.9	Good	Heavy Bodied	M3+40%↑
	AMC 108+	20	1.5	15.8	4.1	Good	Med. Bodied	M3
	JRK-2019-4	12	1.0	23.7	4.0	Good	Med. Bodied	M2
Amadalavalasa	JRK-2019-3	30	1.0	14.3	3.4	Fair Average	Med. Bodied	M4+80%↑
	JRK-2019-1	30	1.5	15.7	3.7	Average	Med. Bodied	M4+30%↑
	HC 583+	30	1.0	13.9	3.0	Fair Average	Heavy Bodied	M4+85%↑
	JRK-2019-2	30	1.0	14.6	3.6	Fair Average	Heavy Bodied	M4+75%↑
	JRHC-15	30	2.0	14.2	3.3	Fair Average	Med. Bodied	M4+20%↑
	AMC 108+	30	1.0	15.3	3.1	Fair Average	Heavy Bodied	M4+85%↑
	JRK-2019-4	30	2.0	15.7	2.9	Fair Average	Med. Bodied	M4+20%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Aduthurai	JRK-2019-3	40	2.0	17.8	3.7	Fair Average	Heavy Bodied	M4+40%↑
	JRK-2019-1	50	2.0	17.1	4.0	Fair Average	Heavy Bodied	M4+20%↑
	HC 583+	50	2.0	18.2	3.6	Fair Average	Very Heavy Bodied	M4+25%↑
	JRK-2019-2	Barky sample						M6
	JRHC-15	50	2.0	19.5	3.8	Average	Heavy Bodied	M4
	AMC 108+	Barky sample						M6
	JRK-2019-4	50	2.0	20.7	3.9	Average	Very Heavy Bodied	M4+25%↑

+; check variety

Rahuri: Root content varied from 12 to 20 percent. Defects varied from 0.5 to 2.0 percent. Fibre tenacity varied from 15.8 to 23.7 g/tex. Fineness of the sample varied from fine to coarser in nature. Fibre grades varied from M4+55%↑ to M2.

Amadalavalasa: Root content was 30 percent. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 13.9 to 15.7 g/tex. Fineness of the samples varied from very fine to fine in nature. Fibre grades varied from M4+20%↑ to M4+80%↑.

Aduthurai: Root content varied from 40 to 50 percent. Defects were 2.0 percent in all the entries. Fibre tenacity varied from 17.1 to 20.7 g/tex. Fineness of the samples was fine in nature. Fibre grades varied from M6 to M4+40%↑. Two entries were barky in nature.

N. B. At Amadalavalasa center root was cut from the fibre sample in all the entries

NP(CB) 1.50: AVT-I with kenaf (*H. cannabinus*)

The trial was conducted in four locations, namely Barrackpore, Kendrapara, Rahuri, Amadalavalasa and Aduthurai with eight entries. Overall grade varied from M2↑ to M4↑. Centre wise results are presented below in table 4.8.

Table 4.8 Fibre quality of entries under AVT-I with kenaf (*H. cannabinus*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore	JRK-2017-2	20	1.0	20.2	3.3	Good	Heavy Bodied	M3+70%↑
	JRK-2018-1	12	1.0	22.7	3.3	Good	Very Heavy Bodied	M2+20%↑
	JRK-2017-1	12	1.0	24.8	3.8	Good	Heavy Bodied	M2+5%↑
	AMC 108+	30	1.5	21.5	4.4	Fair Average	Heavy Bodied	M3+5%↑
	JRK-2018-4	20	0.5	18.3	3.1	Good	Heavy Bodied	M3+90%↑
	HC 583+	12	1.5	23.7	3.1	Good	Medium Bodied	M3+90%↑
	JRK-2018-3	12	1.5	21.3	3.7	Fair Average	Medium Bodied	M3+60%↑
	JRK-2017-5	20	1.5	19.8	3.1	Good	Medium Bodied	M3+45%↑
Kendrapara	JRK-2017-2	12	0.5	20.3	3.5	Fair Average	Medium Bodied	M3+80%↑
	JRK-2018-1	12	1.5	20.3	3.7	Average	Heavy Bodied	M3+25%↑
	JRK-2017-1	20	0.5	23.5	3.8	Fair Average	Heavy Bodied	M3+80%↑
	AMC 108+	20	1.5	20.1	3.9	Fair Average	Heavy Bodied	M3+20%↑
	JRK-2018-4	12	1.0	21.4	3.7	Fair Average	Heavy Bodied	M3+85%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
	HC 583+	12	1.0	18.4	3.6	Average	Medium Bodied	M3+40%↑
	JRK-2018-3	20	0.5	21.2	3.7	Fair Average	Medium Bodied	M3+75%↑
	JRK-2017-5	20	1.0	23.8	3.7	Fair Average	Heavy Bodied	M3+60%↑
Rahuri	JRK-2017-2	20	2.0	17.9	3.4	Fair Average	Medium Bodied	M4+85%↑
	JRK-2018-1	20	1.5	23.1	4.1	Good	Heavy Bodied	M3+60%↑
	JRK-2017-1	20	1.0	17.7	3.7	Fair Average	Heavy Bodied	M3+40%↑
	AMC 108+	12	1.0	18.1	4.4	Good	Very Heavy Bodied	M3+5%↑
	JRK-2018-4	20	1.0	19.3	4.1	Good	Heavy Bodied	M3+60%↑
	HC 583+	12	1.5	20.7	4.1	Good	Heavy Bodied	M3+15%↑
	JRK-2018-3	12	0.5	19.3	3.7	Good	Heavy Bodied	M2
	JRK-2017-5	12	1.5	19.7	3.6	Good	Very Heavy Bodied	M3+20%↑
Amadalavalasa	JRK-2017-2	30	0.5	12.7	3.0	Good	Heavy Bodied	M3+25%↑
	JRK-2018-1	30	1.0	13.2	3.2	Good	Medium Bodied	M3
	JRK-2017-1	30	0.5	12.7	3.2	Good	Heavy Bodied	M3+25%↑
	AMC 108+	30	1.0	18.2	3.8	Good	Heavy Bodied	M3+35%↑
	JRK-2018-4	30	0.5	15.8	3.3	Good	Heavy Bodied	M3+25%↑
	HC 583+	30	1.0	13.9	3.4	Good	Medium Bodied	M3
	JRK-2018-3	30	1.5	14.0	3.7	Good	Heavy Bodied	M4+75%↑
	JRK-2017-5	30	1.0	17.5	3.6	Good	Heavy Bodied	M3+35%↑
Aduthurai	JRK-2017-2	50	2.0	21.1	4.2	Average	Medium Bodied	M3+5%↑
	JRK-2018-1	Barky sample						M6
	JRK-2017-1	50	2.0	19.5	4.3	Fair Average	Heavy Bodied	M3+10%↑
	AMC 108+	50	2.0	18.6	4.4	Average	Heavy Bodied	M5+90%↑
	JRK-2018-4	40	2.0	17.3	3.6	Average	Heavy Bodied	M4+20%↑
	HC 583+	50	2.0	17.9	4.0	Fair Average	Heavy Bodied	M4+20%↑
	JRK-2018-3	50	2.0	17.5	3.7	Average	Heavy Bodied	M4
	JRK-2017-5	Barky sample						M6

+; check variety

Barrackpore: Root content varied from 12 to 30 percent. Defects varied from 0.5 to 1.5 percent. Fibre tenacity varied from 18.3 to 24.8 g/tex. Fineness of the sample varied from very fine to coarser in nature. Fibre grades varied from M3+5%↑ to M2+20%↑.

Kendrapara: Root content varied from 12 to 20 percent. Defects varied from 0.5 to 1.5 percent. Fibre tenacity varied from 18.4 to 23.8 g/tex. Fineness of the samples was fine in nature. Fibre grades varied from M3+20%↑ to M3+90%↑.

Rahuri: Root content varied from 12 to 20 percent. Defects varied from 0.5 to 2.0 percent. Fibre tenacity varied from 17.9 to 23.1 g/tex. Fibre samples were fine to coarser in nature. Fibre grades varied from M4+85%↑ to M2.

Amadalavalasa: Root content was 30 percent. Defects varied from 0.5 to 1.5 percent. Fibre tenacity varied from 12.7 to 18.2 g/tex. Fineness of the sample varied from very fine to fine in nature. Fibre grades varied from M4+75%↑ to M3+35%↑.

Aduthurai: Root content varied from 40 to 50 percent. Defects were 2.0 percent in all the entries. Fibre tenacity varied from 17.3 to 21.1 g/tex. Fineness of the samples varied from fine to coarser in nature. Fibre grades varied from M6 to M3+10%↑. Two entries were barky in nature.

N. B. At Amadalavalasa center root was cut from the fibre sample in all the entries

NP(CB) 1.51: AVT-II with kenaf (*H. cannabinus*)

The trial was conducted in four locations, namely Barrackpore, Kendrapara, Rahuri, Amadalavalasa and Aduthurai with five entries. Overall grade varied from M2↑ to M4↑. Centre wise results are presented below in table 4.9.

Table 4.9 Fibre quality of entries under AVT-II with kenaf (*H. cannabinus*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Barrackpore	JRK-2016-2	20	1.5	20.1	3.4	Good	Medium Bodied	M3+45%↑
	JRK-2016-5	12	0.5	22.6	3.3	Good	Heavy Bodied	M2+40%↑
	HC 583+	12	1.0	20.2	3.3	Good	Medium Bodied	M3+90%↑
	JRK-2016-1	12	1.5	23.3	3.8	Good	Heavy Bodied	M3+85%↑
	AMC 108+	12	1.0	21.5	4.0	Good	Heavy Bodied	M2+5%↑
Kendrapara	JRK-2016-2	30	1.0	22.4	3.3	Average	Medium Bodied	M3+20%↑
	JRK-2016-5	12	0.5	18.7	3.1	Fair Average	Heavy Bodied	M3+95%↑
	HC 583+	12	1.0	14.7	3.0	Average	Heavy Bodied	M3+15%↑
	JRK-2016-1	12	0.5	21.3	3.1	Fair Average	Heavy Bodied	M2+15%↑
	AMC 108+	12	1.0	18.9	3.4	Average	Heavy Bodied	M3+30%↑
Rahuri	JRK-2016-2	20	1.0	18.8	3.9	Fair Average	Heavy Bodied	M3+40%↑
	JRK-2016-5	12	1.5	24.5	4.0	Fair Average	Very Heavy Bodied	M3+70%↑
	HC 583+	40	2.0	21.6	4.4	Average	Medium Bodied	M4+25%↑
	JRK-2016-1	12	1.0	18.1	4.2	Good	Heavy Bodied	M3+85%↑
	AMC 108+	50	2.0	20.2	4.4	Average	Heavy Bodied	M5+90%↑
Amadalavalasa	JRK-2016-2	30	0.5	18.6	3.6	Good	Heavy Bodied	M3+55%↑
	JRK-2016-5	30	1.0	17.1	3.6	Fair Average	Medium Bodied	M3+10%↑
	HC 583+	30	1.5	17.7	3.1	Fair Average	Medium Bodied	M3
	JRK-2016-1	30	1.0	15.6	3.2	Fair Average	Heavy Bodied	M4+85%↑
	AMC 108+	30	0.5	20.1	3.4	Fair Average	Heavy Bodied	M3+45%↑
Aduthurai	JRK-2016-2	40	2.0	19.3	4.0	Fair Average	Heavy Bodied	M4+40%↑
	JRK-2016-5	50	2.0	18.1	4.0	Fair Average	Heavy Bodied	M4+20%↑
	HC 583+	50	2.0	14.7	3.6	Average	Medium Bodied	M5+44%↑
	JRK-2016-1	12	1.5	21.8	4.4	Fair Average	Heavy Bodied	M3+55%↑
	AMC 108+	50	2.0	17.7	3.9	Average	Medium Bodied	M5+95%↑

+; check variety

Barrackpore: Root content varied from 12 to 20 percent. Defects varied from 0.5 to 1.5 percent. Fibre tenacity varied from 20.1 to 23.3 g/tex. Fineness of the sample varied from very fine to fine in nature. Fibre grades varied from M3+45%↑ to M2+40%↑.

Kendrapara: Root content varied from 12 to 30 percent. Defects varied from 0.5 to 1.0 percent. Fibre tenacity varied from 14.7 to 22.4 g/tex. Fineness of the samples was very fine in nature. Fibre grades varied from M3+20%↑ to M2+15%↑.

Rahuri: Root content varied from 12 to 50 percent. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 18.1 to 24.5 g/tex. Fineness of the sample varied from fine to coarser in nature. Fibre grades varied from M5+90%↑ to M3+85%↑.

Amadalavalasa: Root content is 30 percent. Defects varied from 0.5 to 1.5 percent. Fibre tenacity varied from 15.6 to 20.1 g/tex. Fineness of the sample varied from very fine to coarser in nature. Fibre grades varied from M4+85%↑ to M3+55%↑.

Aduthurai: Root content varied from 12 to 50 percent. Defects varied from 1.5 to 2.0 percent. Fibre tenacity varied from 14.7 to 21.8 g/tex. Fineness of the sample varied from fine to coarser in nature. Fibre grades varied from M5↑ to M3+55%↑.

N. B. At Amadalavalasa center root was cutted from the fibre sample in all the entries

NP(SB) 12.78: IET with roselle (*H. sabdariffa*)

The trial was conducted in four locations, namely Rahuri, Amadalavalasa, Katihar and Aduthurai with seven entries. Overall grade varied from B2↑ to B3↑. Centre wise results are presented below in table 4.10.

Table 4.10 Fibre quality of entries under IET with roselle (*H. sabdariffa*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Rahuri	AHS-343	18	2.0	18.7	4.1	Good	Medium Bodied	B3+40%↑
	HS 4288+	10	2.0	18.3	3.4	Average	Medium Bodied	B3+53%↑
	AHS-333	10	2.0	19.7	4.1	Good	Medium Bodied	B3+67%↑
	AD(RO)17002	10	1.5	18.1	4.3	Good	Medium Bodied	B3+83%↑
	AMV 5+	10	1.5	17.8	3.7	Good	Medium Bodied	B3+83%↑
	AHS-321	10	1.5	20.1	3.3	Good	Medium Bodied	B3+83%↑
	JRR-2018	25	2.0	17.9	3.8	Good	Medium Bodied	B3+17%↑
Amadalavalasa	AHS-343	18	2.0	14.6	2.7	Average	Medium Bodied	B3+33%↑
	HS 4288+	18	1.5	15.6	2.8	Average	Medium Bodied	B3+50%↑
	AHS-333	18	1.0	19.7	2.6	Good	Medium Bodied	B3+93%↑
	AD(RO)17002	18	2.0	20.1	2.9	Average	Medium Bodied	B3+33%↑
	AMV 5+	18	2.0	18.1	2.5	Average	Medium Bodied	B3+33%↑
	AHS-321	18	2.0	18.2	2.7	Average	Medium Bodied	B3+33%↑
	JRR-2018	18	2.0	16.2	2.5	Average	Medium Bodied	B3+33%↑
Katihar	AHS-343	18	Nil	14.3	2.4	Average	Medium Bodied	B2
	HS 4288+	18	1.0	15.6	2.6	Good	Medium Bodied	B3+93%↑
	AHS-333	18	1.0	19.2	2.5	Good	Medium Bodied	B3+93%↑
	AD(RO)17002	18	1.0	16.4	3.0	Good	Medium Bodied	B3+93%↑
	AMV 5+	18	1.0	14.3	2.4	Average	Medium Bodied	B3+80%↑
	AHS-321	18	1.0	17.6	2.7	Good	Medium Bodied	B3+93%↑
	JRR-2018	25	Nil	17.8	2.7	Good	Medium Bodied	B3+47%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Aduthurai	AHS 343	25	2.0	21.6	3.8	Average	Heavy Bodied	B3+40%↑
	HS 4288+	25	2.0	21.1	3.7	Average	Heavy Bodied	B3+40%↑
	AHS-333	25	2.0	21.6	3.5	Average	Heavy Bodied	B3+40%↑
	AD(RO)17002	Barky sample						B4
	AMV 5+	25	2.0	22.0	3.4	Average	Heavy Bodied	B3+40%↑
	AHS-321	Barky sample						B4
	JRR-2018	25	2.0	18.4	3.8	Average	Medium Bodied	B3

+; check variety

Rahuri: Root content varied from 10 to 25 percent. Defects varied from 1.5 to 2.0 percent. Fibre tenacity varied from 17.8 to 20.1 g/tex. Fibre samples were coarser in nature. Fibre grades varied from B3+17%↑ to B3+83%↑.

Amadalavalasa: Root content was 18 percent. Defects varied from nil to 1.0 percent. Fibre tenacity varied from 14.6 to 20.1 g/tex. Fineness of the samples was fine in nature. Fibre grades varied from B3+33%↑ to B3+93%↑.

Katihar: Root content was 18 percent in all the entries. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 14.3 to 19.2 g/tex. Fineness of the samples was fine in nature. Fibre grades varied from B3+47%↑ to B2.

Aduthurai: Root content was 25 percent in all the entries. Defects were 2.0 percent. Fibre tenacity varied from 18.4 to 22 g/tex. Fineness of the samples was coarse in nature. Fibre grades varied from B4 to B3+40%↑. Two entries were barky in nature

N. B. At Amadalavalasa center root was cut from the fibre sample in all the entries.

NP(SB) 12.79: AVT-I with roselle (*H. sabdariffa*)

The trial was conducted in four locations, namely Rahuri, Amadalavalasa, Katihar and Aduthurai with five entries. Overall grade varied from B2↑ to B3↑. Centre wise results are presented below in table 4.11.

Table 4.11 Fibre quality of entries under AVT-I with roselle (*H. sabdariffa*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Rahuri	AHS-342	10	1.0	19.6	3.0	Good	Heavy Bodied	B2+63%↑
	AMV 5+	10	1.5	18.7	3.2	Good	Medium Bodied	B3+83%↑
	AHS-335	10	2.0	20.1	3.4	Good	Medium Bodied	B3+67%↑
	BRRM-1	10	2.0	19.6	3.3	Average	Medium Bodied	B3+53%↑
	HS 4288+	10	1.0	20.3	3.2	Good	Heavy Bodied	B2+23%↑
Amadalavalasa	AHS-342	18	2.0	16.0	2.7	Average	Medium Bodied	B3+33%↑
	AMV 5+	18	2.0	16.1	2.8	Average	Medium Bodied	B3+33%↑
	AHS-335	18	2.0	17.3	2.6	Average	Medium Bodied	B3+33%↑
	BRRM-1	18	1.5	18.1	2.7	Average	Medium Bodied	B3+50%↑
	HS 4288+	18	1.0	18.8	2.5	Good	Medium Bodied	B3+60%↑
	AHS-342	18	1.0	12.1	2.2	Average	Medium Bodied	B3+80%↑
	AMV 5+	25	1.5	19.1	3.0	Good	Medium Bodied	B3+7%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Katihar	AHS-335	18	1.5	15.9	2.6	Average	Medium Bodied	B3+50%↑
	BRRM-1	18	1.5	13.5	2.7	Good	Medium Bodied	B3+63%↑
	HS 4288+	18	1.0	19.4	2.9	Good	Medium Bodied	B3+93%↑
Aduthurai	AHS-342	25	2.0	19.5	3.4	Average	Heavy Bodied	B3+13%↑
	AMV 5+	25	2.0	19.7	3.2	Average	Heavy Bodied	B3+13%↑
	AHS-335	10	1.5	20.4	3.5	Average	Heavy Bodied	B3+80%↑
	BRRM-1	18	2.0	21.7	3.1	Average	Heavy Bodied	B3+76%↑
	HS 4288+	25	2.0	18	3.4	Good	Heavy Bodied	B3+26%↑

+; check variety

Rahuri: Root content was 10 percent in all the entries. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 18.7 to 20.3 g/tex. Fineness of the sample was coarser in nature. Fibre grades varied from B3+53%↑ to B2+63%↑.

Amadalavalasa: Root content was 18 percent in all the entries. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 16.0 to 18.8 g/tex. Fibre sample was fine in nature. Fibre grades varied from B3+33%↑ to B3+60%↑.

Katihar: Root content varied from 18 to 25 percent in all the entries. Defects varied from 1.0 to 1.5 percent. Fibre tenacity varied from 12.1 to 19.4 g/tex. Fibre sample was fine in nature. Fibre grades were B3+7%↑ to B3+93%↑.

Aduthurai: Root content varied from 10 to 25 percent in all the entries. Defects varied from 1.5 to 2.0 percent. Fibre tenacity varied from 18 to 21.7 g/tex. Fineness of the sample was coarse in nature. Fibre grades varied between B3+13%↑ to B3+80%↑.

N. B. At Amadalavalasa center root was cut from the fibre sample in all the entries

NP(SB) 12.80: AVT-II with roselle (*H. sabdariffa*)

The trial was conducted in five locations, namely Kendrapara Rahuri, Amadalavalasa Katihar and Aduthurai with five entries. Overall grade varied from B2↑ to B3↑. Centre wise results are presented below in table 4.12.

Table 4.12 Fibre quality of entries under AVT-II with roselle (*H. sabdariffa*)

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Kendrapara	AHS-310	25	1.0	17.7	3.4	Good	Medium Bodied	B3+63%↑
	AHS-307	10	1.0	16.5	3.3	Good	Medium Bodied	B3+63%↑
	AMV 5+	18	1.5	16.4	3.4	Average	Medium Bodied	B3+43%↑
	AHS-309	25	1.5	17.5	3.5	Average	Medium Bodied	B3+20%↑
	HS 4288+	25	1.0	16.0	3.2	Good	Medium Bodied	B3+63%↑
Rahuri	AHS-310	10	1.0	17.8	3.1	Good	Heavy Bodied	B2+23%↑
	AHS-307	10	2.0	20.8	3.3	Good	Medium Bodied	B3+67%↑
	AMV 5+	10	1.5	19.7	3.0	Good	Heavy Bodied	B2
	AHS-309	18	1.5	21.3	3.4	Good	Heavy Bodied	B3+93%↑
	HS 4288+	10	1.0	21.1	3.0	Good	Medium Bodied	B2+47%↑

Centre	Entry	Root content (%)	Defects (%)	Tenacity (g/tex)	Fineness (tex)	Colour	Bulk Density	BIS Grade
Amadalavalasa	AHS-310	18	2.0	10.7	2.8	Average	Medium Bodied	B3+33%↑
	AHS-307	18	1.0	14.7	2.9	Good	Medium Bodied	B3+60%↑
	AMV 5+	18	2.0	15.6	2.7	Average	Medium Bodied	B3+33%↑
	AHS-309	18	1.5	17.3	2.9	Average	Medium Bodied	B3+50%↑
	HS 4288+	18	2.0	18.6	2.6	Average	Medium Bodied	B3+33%↑
Katihar	AHS-310	18	Nil	13.7	2.4	Good	Heavy Bodied	B3+23%↑
	AHS-307	18	1.5	14.6	2.8	Average	Medium Bodied	B3+50%↑
	AMV 5+	25	1.0	18.9	2.8	Good	Medium Bodied	B3+70%↑
	AHS-309	18	1.0	18.2	2.7	Good	Heavy Bodied	B2
	HS 4288+	25	1.0	17.3	2.5	Average	Medium Bodied	B3+56%↑
Aduthurai	AHS-310	Barky sample						B4
	AHS-307	25	2.0	18.3	3.2	Average	Heavy Bodied	B3+13%↑
	AMV 5+	25	2.0	18.1	3.1	Average	Heavy Bodied	B3+13%↑
	AHS-309	18	2.0	17.0	3.3	Average	Heavy Bodied	B3+36%↑
	HS 4288+	25	2.0	20.9	3.2	Good	Heavy Bodied	B3+27%↑

+; check variety

Kendrapara: Root content varied from 10 to 25 percent in all the entries. Defects varied from 1.0 to 1.5 percent. Fibre tenacity varied from 16.0 to 17.7 g/tex. Fineness of the sample was coarser in nature. Fibre grades were B3+20%↑ and B3+63%↑

Rahuri: Root content varied from 10 to 18 percent in all the entries. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 17.8 to 21.3 g/tex. Fineness of the sample was coarse in nature. Fibre grades varied from B3+67%↑ to B2+47%↑.

Amadalavalasa: Root content was 18 percent in all the entries. Defects varied from 1.0 to 2.0 percent. Fibre tenacity varied from 10.7 to 18.6 g/tex. Fineness of the samples was coarse in nature. Fibre grades varied from B3+33%↑ to B3+60%↑.

Katihar: Root content varied from 18 to 25 percent in all the entries. Defects varied from nil to 1.5 percent. Fibre tenacity varied from 13.7 to 18.9 g/tex. Fineness of the samples was fine in nature. Fibre grades varied from B3+23%↑ to B3+70%↑.

Aduthurai: Root content varied from 18 to 25 percent in all the entries. Defects were 2.0 percent. Fibre tenacity varied from 17 to 20.9 g/tex. Fineness of the sample was coarse in nature. Fibre grades were B4 to B3+36%↑.

N. B. At Amadalavalasa center root was cut from the fibre sample in all the entries

NP(SNH-B) 1.30: IET with sunnhemp (*C. juncea*)

Experiment was conducted at three locations namely, Pratapgarh, Kalyani and Budbud with six entries. The fibre tenacity data is presented in table 1.13.

Table 4.13 Fibre tenacity of entries under IET with sunnhemp (*C. juncea*)

Centre	Entry	Fibre Tenacity (g/tex)
Pratapgarh	SUNC-14	11.8
	SH 4+	13.9
	ADSH-17009	13.5
	SUNC-12	11.3
	SUIN 053+	14.4
	SUNC-13	9.5
Kalyani	SUNC-14	15.7
	SH 4+	13.6
	ADSH-17009	15.1
	SUNC-12	14.1
	SUIN 053+	15.1
	SUNC-13	17.9
Budbud	SUNC-14	18.6
	SH 4+	16.8
	ADSH-17009	14.9
	SUNC-12	15.4
	SUIN 053+	20.9
	SUNC-13	13.3

+; check variety

Pratapgarah: Tenacity of all the samples were weak in nature

Kalayani: Tenacity of all the samples were weak to average in nature

Budbud: Tenacity of all the samples was average in nature.

Tribal Sub Plan

The Tribal Sub Plan programme during 2020 crop season had been taken up by AINPJAF centres of BCKV, Kalyani; UBKV, Coochbehar and RARS, Nagaon. The TSP programme had been conducted in six (06) villages belonging to three (03) districts (North 24 Parganas and Coochbehar districts of West Bengal and Nagaon district of Assam) covering 19.12 ha area and involving 89 tribal farmers. Under this programme, field demonstrations were conducted on farmers' participatory mode on new varieties of jute (JRO 204 & JBO-2003-H), line sowing using CRIJAF Multi Row Seed Drill, integrated weed management using CRIJAF Nail Weeder, IPM and improved retting using CRIJAF SONA in farmers' fields. In south Bengal, the activities were carried out in Srikrishnapur village of North 24 Paraganas in 1.79 ha area involving 19 tribal farmers whereas in north Bengal, the activities were carried out in Badalgir, Atialdanga, Jagiarbalabari and Kalmati villages of Dinhata-II, block under Coochbehar district covering 12.0 ha area and 35 tribal farmers were involved. In Assam, 35 tribal farmers belonging to Mazgaon Jajori village of Nagaon district were involved in the programme and 5.33 ha area was covered under demonstration of improved technologies of jute and allied fibre crops. Field demonstrations on new varieties, improved production technologies comprising of line sowing using CRIJAF Multi-Row Seed Drill, integrated nutrient management, integrated weed management using CRIJAF Nail Weeder, IPM modules for jute and improved microbial retting using microbial consortium CRIJAF SONA were conducted in farmers' fields under farmers' participatory mode. The salient achievements of the participating AINPJAF centres are presented below.

Coochbehar: The programme was carried out in Badalgir, Atialdanga, Jagiarbalabari and Kalmati villages of Dinhata-II block under Cooch Behar district covering 12.0 ha area and 35 tribal farmers were involved.

The improved varieties of jute JRO 204 and JBO 2003-H recorded 1.5 – 3.0 q/ha (5.7 – 11.5% increase) higher fibre yield over existing variety JRO 524 (26.0 q/ha) in farmers' fields (table 5.1). The new varieties JRO 204 and JBO 2003-H recorded additional net return of Rs 6338/ha to Rs 12675/ha and higher B:C ratio of 1.55 to 1.63 compared to JRO 524 (table 5.1).

Table 5.1 Fibre yield and economics of cultivation of *tossa* jute varieties in farmers' fields at Coochbehar, West Bengal

Treatments	Area (ha)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
JRO 524	2.00	26.00	75000	109850	34850	1.46
JBO-2003-H	2.00	27.50	75000	116188	41188	1.55
JRO 204	2.00	29.00	75000	122525	47525	1.63

Selling price of jute @ Rs.4225/q as per MSP

Line sowing with CRIJAF Multi Row Seed Drill reduced the cost of cultivation by Rs 6000/ha and recorded 5.0 q/ha additional fibre yield of jute over farmers' practise (broadcasting) (22.0 q/ha) and additional net return of Rs. 27125/ha and B:C ratio of 1.54 compared to broadcasted crop (table 5.2).

Table 5.2 Fibre yield and economics of cultivation of line sowing in *tossa* jute in farmers' fields at Coochbehar, West Bengal

Treatments	Area (ha)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
Farmers practice (Broadcasting)	2.0	22	80000	92950	12950	1.16
Line sowing with multi-row seed drill	6.0	27	74000	114075	40075	1.54

Selling price of jute @ Rs.4225/q as per MSP

Under integrated weed management programme, a reduction in cost of cultivation by Rs. 10000/ha and yield benefit of 4.0 q/ha was achieved over hand weeding along with additional profit of Rs. 26900/ha and B:C ratio of 1.64 compared to hand weeding practise (table 5.3).

Table 5.3 Fibre yield and economics of cultivation of integrated weed management in *tossa* jute in farmers' fields at Coochbehar, West Bengal

Treatments	Area (ha)	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
Farmers practice (Hand weeding)	1.00	24.00	82000	101400	19400	1.24
Integrated weed management	5.00	28.00	72000	118300	46300	1.64

Selling price of jute @ Rs.4225/q as per MSP

Nagaon: In Assam, the TSP programme was conducted at Mazgaon Jajori village of Nagaon district covering 5.33 ha area and 35 tribal farmers belonging were involved in the programme. Field demonstrations were conducted on improved *tossa* jute variety (Tarun), integrated weed management using CRIJAF Nail Weeder, IPM on jute and microbial retting of jute using CRIJAF SONA.

Demonstration of Tarun recorded yield benefit of 6.25 q/ha in *tossa* jute along with additional net return of Rs. 26406/ha over JRO 524 (22.83 q/ha & Rs. 16457/ha) and higher B:C ratio of 1.54 compared to 1.21 with JRO 524 (table 5.4).

Table 5.4 Fibre yield and economics of cultivation of *tossa* jute variety Tarun in farmers' fields at Nagaon, Assam

Treatments	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
JRO 524	22.83 (22.31 – 23.34)	80000	96457	16457	1.21
Tarun	29.08 (28.32 – 29.84)	80000	122863	42863	1.54

Selling price of jute @ Rs.4225/q as per MSP

Demonstration of integrated weed management using CRIJAF Nail Weeder recorded yield benefit of 4.83 q/ha in *tossa* jute along with additional net return of Rs. 24807/ha over hand weeding (23.95 q/ha & Rs. 10689/ha) and higher B:C ratio of 1.41 compared to 1.12 with hand weeding method (table 5.5). The cost of cultivation was also reduced by Rs.4400/ha.

Table 5.5 Fibre yield and economics of of integrated weed management in *tossa* jute in farmers' fields at Nagaon, Assam

Treatments	Yield (q/ha)	Cost of cultivation (Rs/ha)	Gross return (Rs/ha)	Net return (Rs/ha)	B:C
Farmers practice (Hand weeding)	23.95 (23.54-24.36)	90500	101189	10689	1.12
Integrated weed management (Nail weeder)	28.78 (28.72-28.84)	86100	121596	35496	1.41

Selling price of jute @ Rs.4225/q as per MSP

Demonstration of integrated pest management in jute (seed treatment with *T. viride* @ 10 g/kg seed + soil application of *T. viride* @ 2.5 kg/ha + 03 spray of neem oil @ 4 ml/l + erection of bamboo perch @ 40/ha + mechanical collection and destruction of egg masses and congregated larvae of BHC) recorded an yield increase of about 21% over yield recorded with farmers' practise of one application of quinalphos spray (24.8 q/ha). The demonstration on improved microbial retting of jute using "CRIJAF SONA" improved the quality of the jute fibres by at least by one (01) grade as compared to traditional retting techniques followed by the farmers.

BCKV: The programme was conducted at Matiagacha village of North 24 Parganas district over 1.79 ha area covering 19 tribal farmers and demonstration was given on improved jute variety JRO 204.

31st Annual Workshop

The 31st Annual Workshop of All India Network Project on Jute & Allied Fibres (AINPJAF) was conducted at OUAT, Bhubaneswar, Odisha during February 14-15, 2020. The programme started with ICAR theme song, followed by lightening of the lamp by Dr. P. K. Agrawal, Hon'ble Vice Chancellor, OUAT; Dr. R. K. Singh, ADG(CC), ICAR; Dr. J. Mitra, Director (Actg.), ICAR-CRIJAF; Dr. H. Patro, Director, PME, OUAT; Dr. S. Mitra, In-Charge, AINPJAF and Dr. G. B. Dash, Assoc. Prof., JRS, Kendrapara.

Dr. Hrisikesh Patro, Director PME, OUAT, delivered the welcome address and expressed sincere thanks to the Council for organizing the Workshop at OUAT, Bhubaneswar. Dr. Patro highlighted the present status of jute cultivation in Odisha and also stressed upon the impact of jute farming on the rural economy of the eastern India. He also presented the contribution of AINPJAF unit of BCKV in developing improved technologies for raw jute.

Dr. P. K. Agrawal, Hon'ble Vice Chancellor, OUAT emphasized on the importance of enhancing the indigenous availability of good quality jute fibre within the country to cater to the demand of value added jute diversified products in India and abroad. He also stressed upon the need of development of low cost location specific technologies having higher adaptability to the farmers and can increase the profitability of jute farming. He referred to the superiority of jute to its synthetic counterparts.

Dr. J. Mitra, Director (Actg.), ICAR-CRIJAF emphasized upon trait specific breeding programmes for the development of JAF varieties possessing better fibre quality and increased tolerance / resistance to biotic and abiotic stresses. In this regard, he urged upon the AINPJAF scientists on strengthening the collection and evaluation of JAF germplasm and their subsequent utilization in the development of improved JAF varieties.

Dr. R. K. Singh, ADG (CC), ICAR expressed his concern about climate change and urged the scientists to strengthen their research activities in developing technologies having the potential to mitigate its adverse effect on productivity and quality of jute and allied fibre crops. He also emphasized upon creation of strong linkage between the AINPJAF centres, KVKs, State Agriculture Departments and NGOs for better promotion and dissemination of improved technologies developed by the AINPJAF scheme.

Dr. S. Mitra, In-Charge, AINPJAF presented the comprehensive results of the multi-location trials conducted in the AINPJAF centres across the country. He also presented the technology demonstrations conducted by AINPJAF through the TSP programme. The programme was concluded with a formal vote of thanks from Dr. G. B. Dash, Assoc. Professor, OUAT.

General Recommendations

- Centres should provide complete results of the varietal trials in the prescribed format providing complete result on disease and pest infestation.
- IET will be conducted in all trials with a plot size of 10 rows of three replications.
- Fibre samples for estimation of fibre quality should be sent to ICAR-NIRJAFT following proper guidelines.
- Weed management studies should mandatorily include weed index and weed control efficiency values and weed survey to be conducted by the centres.
- All the centres should come out with the region specific constraints for production management on fibre crops.
- For presenting the data of any trials, the cropping history of the site/location should be communicated and also to be mentioned during the presentation in the group discussion.
- All trials should be taken under uniform set of parameters.
- Replicated raw data of each project to be maintained at respective centres and same should be sent to HQ, Barrackpore as per prescribed format.
- The disease incidence for survey and surveillance, germplasm evaluation and AVT-II trials must be recorded as percent disease incidence (PDI).
- Present disease incidence in stem rot will also be taken under consideration to calculate CODEX for better representation of the extant of stem rot.
- The reporting of the experimental data must be in MS Excel work sheet as per the design of the experiment.

Action Taken

- The performance of the centres had been presented in the workshop.
- Survey and surveillance on pest and diseases of jute and mesta had been conducted in different districts of West Bengal, Assam, Bihar, Odisha, Uttar Pradesh, Andhra Pradesh, Tamil Nadu and reported accordingly.
- The trials had been conducted as per the technical programme.
- Pooled analysis had been done in experiments conducted for two years or more and centre-wise recommendations had been made.
- Demonstrations of improved technologies for jute had been made in tribal farmers' fields under TSP programme in different districts of West Bengal, Assam and Odisha in farmers' participatory mode.

Varieties Identified

- Three varieties of jute and mesta including JROB 2 of *tossa* jute, JRCJ 11 of white jute and AMV 10 of roselle had been identified in Variety Identification Committee meeting on 14th February 2020 for recommendation to the CSC on CSN & RV for release.

Publications

Research Articles

Alam, N.M., Mazumdar, S.P., Mitra, S., Saha, R., Panday, S.K., Panwar, S. and Kar, G. 2021. Predictive model for dry fibre yield estimation of tossa jute (*Corchorus olitorius*) in India. *Indian Journal of Agricultural Science* (Accepted)

Bhor, T.J., Pacharne, D.P. and Wagh, R.S. 2020. Genetic variability, correlation and path analysis studies in jute (*C. olitorius*) germplasm lines. *Journal of Pharmacognosy and Phytochemistry* **9**(5): 359-364.

Kar, G., Chaudhari, S.K., Patra, P.K., Dixit, P.R. and Alam, N.M. 2020. GIS Based Sustainable Land Use Planning using Spatial Variation of Soil and Terrain Information. *Journal of Agricultural Physics* **21**(1): 15-21.

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Meena, V.S., Ghosh, B.N., Singh, R.J., Bhattacharyya, R., Sharma, N.K., Alam, N,M., Meena, S.K. and Mishra, P.K. 2020. Land use types and topographic position affect soil aggregation and carbon management in the mountain agro-ecosystems of Indian Himalayas. *Land Degradation & Development* https://doi.org/10.1002/ldr.3864

Pacharne, D.P., Deshmukh, D.V. and R.S. Wagh. 2020. Productivity, seed quality and economics of tossa Jute (*Corchorus olitorius* L.) as influenced by different fertilizer levels. *Indian Journal of Agronomy* (Accepted).

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Rathore, A.C., Mehta, H., Sharma, N.K., Gupta, A.K., Alam, N.M., Islam, S. and Dogra, P. 2020. Performance of litchi (Litchi chinensis Sonn.) based agrihorticultural land uses in rainfed condition on degraded lands in North Western Himalayas, India. *Agroforestry Systems* https://doi.org/10.1007/s10457-020-00544-z.

Roy, A., Dasgupta, K., Hazari, S., Bhattacharya, S. and Das, A. 2020. Heterosis and combining ability analysis for yield contributing characters in Tossa jute (*Corchorus olitorius* L.*). Current Journal of Applied Science and Technology* (Acctpted)

Roy, A., Hazari, S., Bhattacharya, S. 2020. Analysis of comparative genetic diversity in two cultivated species of jute. *International journal of Microbiology and Applied Science* **9**(01): 221-230.

Rout, M.K., Dash, G.B., Jena, S. and Kas, S.K. 2019. Evaluation of elite *olitorius* jute lines against stem rot under sick plot conditions. *Trends in Biosciences*, **12**(21): 1392-1394

Sarkar, P., Das, S., Kheroar, S., Kundu, A., Barman, S.K., Mandal, K. and Mitra, S. 2020. Bio-efficacy of mineral oil against yellow mite in dark Jute (*Corchorus olitorius* L.) under terai region of West Bengal. *Current Journal of Applied Science and Technology* **39**(18): 77-82.

Singh. C., Raizada, A. and Alam, N.M. 2020. Rehabilitation of old river bed lands by an intensively managed silvi-pastoral system in the north-west Himalayas. *Indian Journal of Soil Conservation* **48**(1): 70-79.

Swathi, B., Patibanda, A.K., Krishna, Prasadji. J., Krishnayya, P.V. and Lal, Ahamed M. 2020. Evaluation of formulations through testing the bioefficacy of selected *Trichoderma* isolate against *S. rolfsii*. *International Journal of Current Microbiology and Applied Sciences* **9**(09): 301-309.

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Tanwar, S.P.S., Verma, A., Kumar, P., Alam, N.M. and Bhatt, R.K. 2019. Biomass and carbon projection models in Hardwickia binate Roxb. vis a vis estimation of its carbon sequestration potential under arid environment. *Archives of Agronomy and Soil Science* DOI: 10.1080/03650340.2019.1701659

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Paper Abstracted

Alam, N.M., Gotyal, B.S., Barman, D., Satpathy, S., Mitra, S. and Sarkar, S.K. 2020. Risk assessment and spread of Cutworm (Spodoptera litura) under climate change scenario in major jute growing states of India through life cycle modelling. has been selected for best paper award in National Seminar on "Agrometeorological intervention for enhancing farmers' income (AGMET-2020) during 20-22 January, 2020 at Kerala Agricultural University, Thrissure

Raju, M., Mitra, S. and Ambethgar, V. 2020. Influence of Weed Management Practices on Growth and Yield Attributes of Mesta (*Hibiscus cannabinus L.*), ICEACBS 2020 Proceedings, Pondycherry, pp; 37.

Raju, M. 2020**.** Impact of different weed management practices on growth and fibre yield of mesta. Indian Society of Weed Science. Biennial Conference of Indian Society of Weed Science. ICAR – Central Coastal Agricultural Research Institute, Goa. pp: 63

Roy, A., Mondal, D. and Hazari, S. 2020. Exploring Jute Leafy vegetables as an unconventional source of Vitamin A in Webinar conducted by BAU on International Web Conference on Biodiversity in Vegetable Crops for Healthier Life and Livelihood" in August 2020.

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Pacharne, D.P., Deshmukh, D.V. and Wagh, R.S. 2020. Online poster presentation on "Effect of Climate Smart Production Technologies for Enhancing Seed Yield Economics of Tossa Jute (*Corchorusolitorius* L)" in National seminar on "Plurastic Extension for Enhancing Farmers Income Through Reaching the Unreaches" jointly organized by MSEB, Akola & MPKV, Rahuri (M.S.) during 6-7, Dec. 2020, pp:149.

Pacharne, D.P. and Deshmukh, D.V. 2020. Online poster presentation on "Crop Diversification Through Seed Production of Sunnhemp' in International-e-Symposium on "Diversification of Indian Agriculture Ancient to Modern" School of Agriculture, Suresh Gyan Vihar University, Jaipur, Rajasthan during June, 17-18, 2020.

Technical Bulletin

Das, Pradip Kumar 2020. *Morapator unnat jaat aru Asomor morapator gunagat mandanda*, Krishi Nav published by Regional Agricultural Station, pp 24-28.

Sarma, Kalyan 2020. *Borosar sokolu mosi*, Krishi Nav, published by Regional Agricultural Research Station, pp 114-115.

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Popular Article / leaflet

Kumar, Santosh, Singh, Vinod Kumar, Arshad Anwar, Md., Shah, S. B. and Md. Akhtar, Nadim. 2020. Kharif dalhani fasal me lagne wale promukh rog tatha unka probandhan. *Vindhya Krishi* 14(3): 67-70.

Singh, Vinod Kumar and Singh, Krishna Kumar. 2020. Dhan ki podhshala ugane ki adhunik taknik. *Vindhya Krishi* 14(3): 63-66.

Book Chapter

Singh, K.P. and Srivastava, J.N. 2020. Present scenario of diseases in jute crops and their integrated management. (In) Diseases of Field Crops: Diagnosis & Management.

Training Programme Conducted

During 2020, 21 trainings were conducted in which total of 867 persons including farmers and farm women participated. The details of the training programme conducted during the period is presented below.

Table: Details of training programme conducted under AINPJAF during 2020

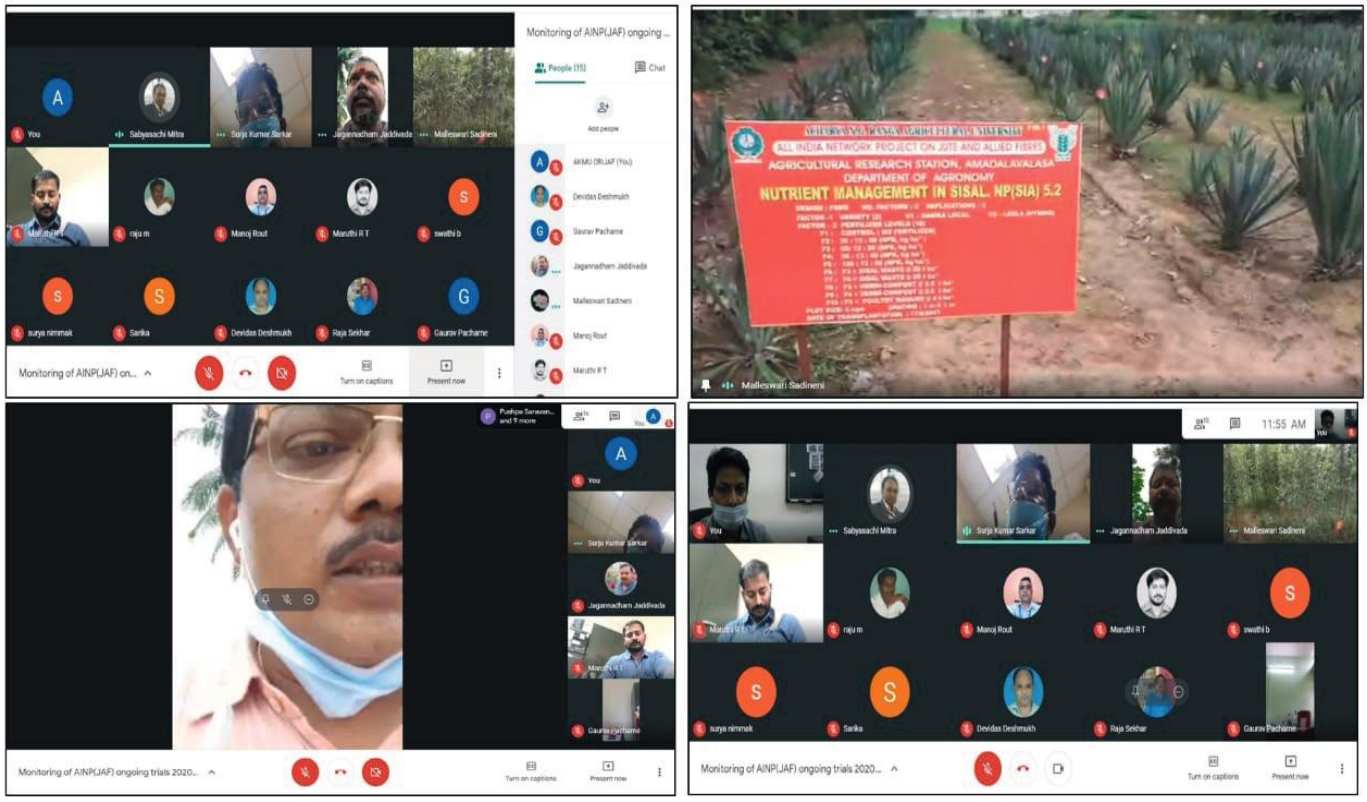
Sl No.	Date	Title	Location	No. of participants
1	08.01.2020	Value added products in mesta	TRRI, Aduthurai, Tamil Nadu	50
2	19.02.2020	Quality maintenance of new jute, mesta and sunnhemp varieties	ARS, Amadalavalasa, Andhra Pradesh	60
3	25.02.2020	Training on mesta based cropping	Yelamanchili, Jalumuru mandal, Andhra Pradesh	40
4	29.02.2020	Pest and disease management in Ragi and other minor millets	Krishi Vigyan Kendra,, Amadalavalasa, Andhra Pradesh	40
5	03.03.2020	Improved varieties in Jute	Mazgaon, Nagaon, Assam	40
6	4.03.2020	Improved seed production technology of jute	Derabish, Kendrapara, Odisha	60
7	04.03.2020	Cultivation practices of jute and allied fibres for seed production and fibre yield to staff and social workers	Krishi Vigyan Kendra,, Jalgaon, Maharashtra	42
8	05 to 07-03-2020	Technological Empowerment of Farm Women	ICAR-CRIJAF, Barrackpore, West Bengal	25
9	05.03.2020	Cultivation practices and seed production technology of jute and allied fibres to contact farmers	Bhadli, Jalgaon, Maharashtra	46
10	06.03.2020	Cultivation practices and seed production technology of jute and allied fibres to contact farmers	Mamurabad, Jalgaon, Maharashtra	52
11	07.03.2020	Cultivation practices of jute and allied fibres for fibre yield and value addition/ processing for fibre.	Krishi Vigyan Kendra, Jalgaon, Maharashtra	32
12	11.03.2020	Improved production tech in jute	Mazgaon, Nagaon, Assam	40
13	12.03.2020	Improved production technologies in sunnhemp	TRRI, Aduthurai, Tamil Nadu	50
14	18.03.2020	Mesta and Mesta based cropping systems	ARS, Amadalavalasa, Andhra Pradesh	40
15	20.03.2020	Diseases and pests of jute	Mazgaon, Nagaon, Assam	40
16	16.06.2020	Package and practice of jure fibre production	UBKV, Cooch Behar, West Bengal	25
17	03.07.2020	Improved retting techniques of jute	UBKV, Cooch Behar, West Bengal	25
18	09.07.2020	Weed management in jute	Mazgaon, Nagaon, Assam	40
19	05.08.2020	Post-harvest techniques in jute	Mazgaon, Nagaon, Assam	40
20	27.08.2020	Improved retting with CRIJAF SONA	Mazgaon, Nagaon, Assam	40
21	07.10.2020	Improved production tech in Sali rice	Mazgaon, Nagaon, Assam	40

Monitoring of AINPJAF Trials

Amidst COVID-19, AINPJAF has conducted monitoring of ongoing trials (2020) of all its eight research stations through online mode during August-September, 2020. In all the monitoring events, apart from the members of the monitoring teams, majority of the scientists of eight AINPJAF centres participated online and gave their valuable suggestion and comments regarding further improvement of the on-going programmes.

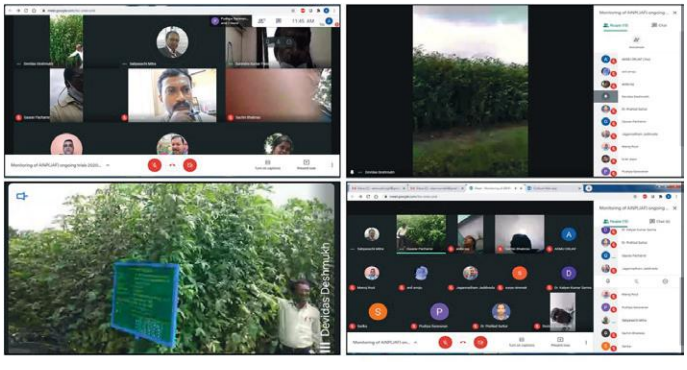
Name of Centre	Monitoring Team		Date
RARS, Nagaon and RARS, Sarbhog	**Dr. Ritesh Saha**	**Group Leader**	25.08.2020
	Dr. Ramesh Babu	Member	
	Dr. S. Kheroar, UBKV, Coochbchar	-do-	
	Dr. G. B. Dash, JRS, Kcndrapara	-do-	
	Dr. K. P Singh, JRS, Katihar	-do-	
JRS, Kendrapara	**Dr. C.S. Kar**	**Group Leader**	26.08.2020
	Dr. N. M. Alam	Member	
	Mr. Kajal Das, RRS,Sorbhog	-do-	
	Dr. K. K. Sharma, RARS, Nagaon	-do-	
	Dr. (Mrs.) B. Swathi, ARS, Amadalavalasa	-do-	
UBKV, Kalyani	**Dr. S. Satpathy**	**Group Leader**	28.08.2020
	Dr. Jiban Mitra	Member	
	Dr. A.R. Saha	-do-	
	Mr. Diwakar Paswan, JRS, Katihar	-do-	
UBKV, Cooch Behar	**Dr. P. Satya**	**Group Leader**	01.09.2020
	Dr. A. S. N. Zaman, RARS, Nagaon	Member	
	Dr. Y. Rajasckhar, ARS, Amadalavalasa	-do-	
	Dr Shiv Kumar, Sh. R. S, Pratapgarh	-do-	
JRS, Katihar	**Dr. Kunal Mandal**	**Group Leader**	04.09.2020
	Dr. B. S. Gotyal	Member	
	Dr. N. M. Alam	-do-	
	Dr. Sarika Jena, JRS, Kcndrapara	-do-	
ARS, Amadalavalasa	**Dr. S. K. Sarkar**	**Group Leader**	25.09.2020
	Dr. Maruthi R.T.	Member	
	Dr. M. Raju, TRRI, Aduthuraui	-do-	
	Mr. Manoj Kr. Rout, JRS, Kcndrapara	-do-	
MVPV, Rahuri	**Dr. S.K. Pandey**	**Group Leader**	29.09.2020
	Dr. A. Anil Kumar	Member	
	Dr. (Mrs.) R. Pushpa, TRRI, Aduthuraui	-do-	
	Mr. Manoj Kr. Rout, JRS, Kcndrapara	-do-	
	Dr. A. Roy Aich, BC:KV, Kalyani	-do-	

Name of Centre	Monitoring Team		Date
TRRI, Aduthurai	**Dr. S. Sarkar**	**Group Leader**	30.09.2020
	Mr. Vikas Mangal	Member	
	Dr. Vinod Kr. Singh, JRS, Katihar	-do-	
	Dr. D.P. Pacharne, MPKV, Rahuri	-do-	
	Dr. J. Jagannadham , ARS, Amadalavalasa	-do-	
	Dr. Shyamli Das, BCKV, Kalyani	-do-	



Online monitoring of ARS, Amadalavalasa

Online monitoring of TRRI, Aduthuraui



Online Monitoring of MVPV, Rahuri

Meteorological Data

All India Network Project on Jute & Allied Fibres, ICAR-CRIJAF, Barrackpore, West Bengal

Month	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)	Rainy Days	Bright Sun shine (hours)	Evaporation (mm)	Wind Vel. (km/hr)	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	23.9	12.3	96.2	59.6	30.8	2	5.2	1.7	1.8	15.3	17.3	18.5	22.7	19.7	19.1
February	26.7	13.8	94.6	44.8	3.3	1	6.6	2.2	1.3	16.9	19.3	20.7	26.1	22.2	21.1
March	31.9	19.8	91.2	45.6	79.6	4	7.5	3.3	1.4	22.8	24.8	25.8	31.5	27.9	26.0
April	34.6	23.8	86.7	52.8	108.2	5	7.0	3.8	3.1	27.3	29.3	30.0	34.6	32.4	30.5
May	34.0	25.4	87.8	62.5	365.6	8	6.6	4.4	5.0	28.1	29.6	30.2	33.8	32.0	30.5
June	33.3	26.6	90.5	75.1	350.1	17	3.5	3.3	4.0	28.7	30.2	30.8	33.1	31.9	31.0
July	33.4	27.0	90.0	73.9	324.3	14	3.8	2.8	4.1	29.0	30.3	31.3	33.5	31.7	31.2
August	32.4	26.8	94.0	79.5	440.7	19	3.3	2.3	3.1	29.0	30.0	30.7	32.6	30.9	30.7
September	33.1	26.6	91.4	75.4	262.9	11	4.4	2.1	2.5	28.6	29.8	30.6	32.8	31.0	30.6
October	32.8	25.0	90.7	63.2	74.1	6	6.2	2.4	2.1	27.5	29.1	30.2	33.1	30.7	30.3
November	29.9	17.9	91.4	45.2	12.2	2	7.3	2.5	2.1	21.5	23.9	25.7	27.7	25.6	25.7
December	25.6	12.6	96.4	47.3	0	0	5.8	1.5	1.8	16.4	19.0	21.0	22.8	20.8	21.1
Total					**2051.8**	**89**									

AINP on Jute & Allied Fibres, BCKV, Mohanpur, Kalyani, West Bengal

Month	Temperature (°C)		Rainfall (mm)	Rainy Days	Soil Temperature (°C)						Wind Vel. (km/hr)	Bright Sun shine (hours)
	Max.	Min.			0630 hr			1330 hrs				
					5 cm	15 cm	30 cm	5 cm	15 cm	30 cm		
January	25.4	8.2	0.0	0							1.50	7.1
February	27.8	10.8	121.9	4							1.81	7.4
March	32.1	14.5	89.8	3	22.77	23.03	24.09	28.40	24.82	23.89	1.58	7.15
April	35.5	15.5	28.6	3	27.62	28.10	30.12	31.90	29.80	31.45	2.51	NA
May	32.9	21.3	308.9	9	28.68	28.64	30.81	32.71	30.34	29.60	3.64	7.45
June	33.6	21.2	169.4	18	29.06	29.47	30.84	33.29	30.91	29.51	3.38	5.41
July	33.4	21.5	375.0	19	29.66	29.54	32.45	34.65	32.00	30.44	2.91	5.01
August	32.7	21.4	370.8	19	29.52	28.95	30.88	32.64	31.09	31.39	2.58	3.57
September	33.5	21.3	205.9	14	29.47	28.92	30.07	33.22	30.97	30.29	2.07	4.47
October	33.6	21.1	39.5	3	29.09	28.44	29.66	33.01	30.63	30.15	1.72	6.50
November	30.7	12.2	0.0	0	24.05	23.67	25.71	26.87	25.13	25.06	1.60	7.30
December	26.06	8.64	0.0	0	18.82	18.82	28.03	28.78	21.77	19.53	1.38	5.57
Total			**1709.8**	**92**								

Regional Agricultural Research Station, Nagaon, Assam

Month	Rainfall (mm)		Rainy Days		Temperature (⁰C)				Relative Humidity (%)			
	Actual	Normal	Actual	Normal	Actual T_{Max}	Normal T_{Max}	Actual T_{Min}	Normal T_{Min}	Actual RH-I	Normal RH-I	Actual RH-II	Normal RH-II
January	18.0	11.7	5	2	22.7	23.4	8.7	10.4	89.0	96	78.0	60
February	39.3	18	4	3	24.6	25.5	9.9	12.9	90.0	92	75.0	53
March	4.7	39.4	3	6	29.0	29.3	14.6	16.4	88.0	88	67.0	49
April	67.9	147.7	11	14	30.5	30.2	16.0	19.9	87.2	89	67.5	60
May	282.5	203.2	16	16	30.7	31.3	19.3	22.6	90.4	91	81.0	68
June	309.6	277.0	20	19	32.6	32.3	22.4	24.8	92.5	92	82.0	72
July	271.0	383.0	24	22	33.0	32.6	23.6	25.6	91.9	93	81.6	74
August	208.0	327.4	12	19	34.7	32.6	23.7	25.7	91.6	92	72.3	74
September	300.8	237.3	17	16	33.1	32	22.7	24.9	92.1	93	78.7	74
October	266.2	110.8	8	8	32.5	30.7	21.0	22.4	91.3	94	79.2	71
November	0.0	16.7	0	2	28.4	28	14.9	17.2	90.7	95	69.8	65
December	22.4	8.0	3	1	24.9	24.9	10.6	12	87.9	96	69.5	60
Total	**1790.4**	**1780.2**	**123**	**128**								

AINP on Jute & Allied Fibres, UBKV, Cooch Behar, West Bengal

Month	Temperature (⁰C)		Relative Humidity (%)		Rainfall (mm)	Bright Sunshine (hours)
	Max.	Min.	Max.	Min.		
January	22.82	9.86	91.13	59.68	0.80	3.22
February	26.05	10.84	84.03	49.66	11.00	3.73
March	29.05	16.13	74.68	51.16	43.40	6.25
April	30.76	18.52	70.50	56.40	107.40	5.96
May	30.64	21.61	82.97	71.45	393.50	4.57
June	31.29	24.33	92.77	81.50	1107.80	3.03
July	30.58	24.68	96.48	85.97	1368.90	1.95
August	33.19	25.40	89.10	76.26	409.80	4.20
September	30.18	23.93	93.37	84.00	1426.70	2.10
October	32.94	22.16	79.74	66.77	90.20	6.05
November	29.56	14.02	70.70	49.20	0.00	6.38
December	26.02	10.23	81.03	55.42	0.00	6.50
Total					**4958.78**	

AINP on Jute & Allied Fibres, TRRI, Aduthurai, Tamil Nadu

Months	Temperature (⁰C)		Relative Humidity (%)	Wind Velocity (km/hr)	Bright Sunshine (hours)	Evaporation (mm)	GBRI (Cal/cm²)	Rainfall (mm)	Rainy Days
	Max.	Min.							
January	30.3	19.1	96	0.1	6.7	1.7	524.44	18.2	3
February	32.3	19.3	96	0.1	7.9	4.8	712.88	0.0	0
March	34.3	21.4	95	1.0	7.9	5.1	716.70	0.0	0
April	35.8	24.5	92	2.6	8.3	5.4	693.95	0.0	0
May	36.4	26.1	86	2.5	6.6	5.8	696.04	27	2
June	35.8	24.9	88	3.1	5.5	5.5	670.25	13.6	3
July	34.4	23.8	91	2.0	4.2	3.8	609.24	154.3	8
August	34.9	24.3	87	5.4	5.8	3.8	673.04	118.6	5
September	34.2	23.8	90	6.1	3.8	1.7	588.74	84.7	9
October	33.9	23.8	89	3.5	5.2	3.1	636.04	56.8	3
November	31.3	21.5	95	1.4	3.8	1.1	492.20	192.6	13
December	28.7	20.9	98	3.5	2.7	0.7	428.43	394.2	9
Total								**1060.0**	**55**

AINP on Jute & Allied Fibres, MPKV, Rahuri, Maharashtra

Month	Temperature (⁰C)		Relative Humidity (%)		Rainfall (mm)	Rainy Day	Evaporation (mm)	Wind Velocity (km/hr)	Bright Sunshine (hours)
	Max.	Min.	Max.	Min.					
January	25.24	12.18	76.49	38.33	0	0	4.44	0.92	7.46
February	30.63	15.30	77.95	32.38	0	0	5.28	1.40	8.43
March	33.10	16.48	72.30	28.95	0	0	6.55	1.78	8.38
April	37.68	20.09	72.29	20.25	0	0	9.46	1.61	9.67
May	39.57	25.15	62.06	20.03	0	0	13.09	4.06	10.23
June	32.48	24.33	85.71	50.43	265.2	15	5.86	3.85	6.29
July	31.24	24.19	86.72	59.47	259.9	12	4.45	3.05	4.67
August	29.03	22.86	87.83	64.83	194.6	15	4.43	3.01	3.94
September	30.05	23.41	90.68	63.75	364.5	14	3.99	1.71	4.60
October	30.74	22.51	89.08	54.80	156	4	4.76	1.30	6.40
November	29.80	17.09	84.75	39.18	0	0	5.13	1.03	8.73
December	28.27	14.71	85.36	38.36	0	0	3.90	1.14	7.49
Total					**1240.20**	**60**			

Jute Research Station, Kendrapara, Odisha

Month	Temperature (°C)		Relative Humidity (%)	Rainfall (mm)	Wind Velocity (km/hr)
	Max.	Min.			
January	25	17	66	11.2	15.0
February	26	19	66	16.4	15.2
March	31	24	71	84.9	18.2
April	33	26	72	148.2	25.9
May	33	28	76	161.6	29.3
June	33	29	73	150.9	25.7
July	32	29	76	134.0	25.5
August	31	26	79	755.4	24.4
September	32	28	78	81.3	18.6
October	31	28	77	343.0	16.9
November	29	21	62	0.5	16.9
December	25	21	65	0.0	11.6
Total				**1887.5**	

Agricultural Research Station, Amadalavalasa, Andhra Pradesh

Month	Rainfall					Temperature (°C)		Humidity (%)		Wind Velocity (km/hr)	Evaporation (mm)	Bright Sun shine (hours)
	Normal		Actual		Rainfall Deviation (%)	Max.	Max. Min.	Min.				
	Rainfall (mm)	Rainy days	Rainfall (mm)	Rainy days								
January	2.9	0	7.0	2	141.4	29.4	18.2	84	64	3.2	2.9	6.2
February	10.5	1	36.4	1	246.7	30.3	19.9	89	55	3.6	3.3	6.4
March	10.7	1	76.0	4	610.3	33.7	22.7	94	54	5.2	6.0	8.3
April	17.9	2	76.8	3	329.1	37.7	25.3	96	38	5.0	4.3	7.5
May	80.6	4	20.4	1	-74.7	40.2	24.4	95	31	4.6	6.0	8.3
June	129.1	7	98.7	10	-23.5	38.1	23.8	91	38	3.1	4.5	4.2
July	182.4	10	108.8	7	-40.4	31.2	25.1	70	50	3.6	4.3	5.0
August	191.4	11	54.0	5	-71.8	32.0	25.9	95	79	6.8	5.2	3.0
September	203.9	10	111.0	8	-45.6	35.0	21.0	95	66	2.9	4.7	6.0
October	169.8	7	223.8	12	31.8	31.1	20.6	93	74	-	3.1	4.3
November	43.7	2	59.0	3	35.0	31.9	20.8	85	71	-	3.8	6.5
December	10.1	1	0	0		31.9	18.7	82	53	7.9	4.4	7.1
Total	**1053.0**	**56**	**871.9**	**56**								

Jute Research Station, Katihar, Bihar

Month	Rainfall (mm)
January	6.8
February	101.0
March	118.8
April	161.4
May	324.4
June	484.9
July	1464.0
August	930.5
September	1742.2
October	191.8
November	0.0
December	0.0
Total	**5525.8**

Financial Statement

Financial statement of AINPJAF, ICAR-CRIJAF, Barrackpore for the period January 2020 to December 2020

(Rs. in lakhs)

Sl. No.	Name of Centre	Approved RE 2019-20	Fund released from January 2020 to March 2020	Approved RE 2020-21	Fund received from Council for 2020-21 (upto 31.12.2020)	Fund released from April 2020 to December,2020
1	All India Network Project on Jute & Allied Fibres, ICAR-CRIJAF, Barrackpore, West Bengal	414.45	11.54	403.47	307.75	6.78
2	Agricultural Research Station (ANGRAU), Amadalavalasa, Andhra Pradesh		18.03			55.66
3	Jute Research Station (OUAT), Kendrapara , Odisha		18.60			34.60
4	Regional Agricultural Research Station (AAU), Nagaon, Assam		31.57			48.00
5	Jute Research Station (BAU), Katihar, Bihar		13.65			40.05
6	AINP on Jute & Allied Fibres, (BCKV), Mohanpur, Kalyani West Bengal		6.12			24.75
7	AINP on Jute & Allied Fibres, (UBKV), Pundibari, Coochbehar, West Bengal		10.86			32.95
8	AINP on Jute & Allied Fibres, TRRI, (TNAU), Aduthurai, Tamil Nadu		12.75			34.25
9	AINP on Jute & Allied Fibres, (MPKV), Rahuri, Maharashtra		4.96			21.41
Total			**128.08**			**298.45**

Staff Position (Scientific)

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Address of Centres of AINP on Jute and Allied Fibres

AINPJAF Regular Centres

1.	Regional Agricultural Research Station (AAU) Shillongoni, P.B. No.33, Nagaon-782 001, Assam	2.	Agricultural Research Station (ANGRAU) Amadalavalasa-532 185 Srikakulam, Andhra Pradesh
3.	AINP on Jute & Allied Fibres (BCKV) BCKV Res. Building No.2 P.O. Krishi Viswavidyalaya-741 252, Nadia, West Bengal	4.	Jute Research Station (OUAT) Jajanga, P.O. Kapaleswar-754 211, Kendrapara, Odisha
5.	Jute Research Station (BAU) P.O. Tingachhia-854 105, Katihar, Bihar	6.	AINP on Jute & Allied Fibres UBKV, Pundibari-736 165, Coochbehar, West Bengal
7.	AINP on Jute & Allied Fibres (MPKV) M.P.K.V, Rahuri- 413 722 Ahmednagar, Maharashtra	8.	Tamil Nadu Rice Research Institute (TNAU), Aduthurai- 612101, Tamil Nadu
9.	ICAR-National Institute of Natural Fibre Engineering and Technology 12, Regent Park, Tollygunge, Kolkata-700 040		

In addition to the regular AINPJAF centres, ICAR-CRIJAF Regional Research Stations, ICAR Institutes (ICAR-NBPGR) and some associated organizations are also involved in implementing AINPJAF programmes which are:

1.	ICAR-CRIJAF-Sisal Research Station Bamra-768 221 Sambalpur, Orissa	2.	ICAR-CRIJAF-Sunnhemp Research Station Pratapgarh-230 001,U.P.
3.	ICAR-CRIJAF-Ramie Research Station P.O. Sorbhog-781 317, Barpeta, Assam,	4.	ICAR-CRIJAF-Central Seed Research Station for Jute & Allied Fibres P.O. Bud Bud, Burdwan-713403, West Bengal
5.	ICAR-National Bureau of Plant Genetic Resources, Pusa Campus New Delhi-110012	6.	Directorate of Jute Development Nizam Palace, Govt. of India, Deptt. of Agriculture 234/4, A.J.C.Bose Road, Kolkata-700 020,
7	Agricultural Department of Jute & Allied Fibres growing states		