

AGRO-ADVISORY TO GROWERS OF JUTE AND ALLIED FIBRES

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**भा.कृ.अ.प. -केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान
ICAR-Central Research Institute for Jute and Allied Fibres**

An ISO 9001: 2015 Certified Institute

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**Agro-advisory to Farming Community of Jute and Allied Fibres
(May 09-23, 2022)**

I. Likely weather in the coming week in jute and allied fibre growing states

State/Agro-climatic Zone/Region	Weather Forecast
Gangetic West Bengal (Murshidabad, Nadia, Hoogly, Howrah, North 24-Prganas, Purba Burdwan, Paschim Burdwan, South 24-Parganas, Bankura, Birbhum)	Total up to 20 mm rainfall is expected during 10-13 May, 2022. Maximum temperature (T_{max}) is expected to be around 32-35°C, and minimum temperature (T_{min}) of around 24-26°C.
Sub-Himalayan West Bengal (Cooch Behar, Alipurduwar, Jalpaiguri, North Dinajpur, South Dinajpur and Malda)	Total up to 140 mm rainfall is expected during 10-13 May, 2022. Maximum temperature (T_{max}) is expected to be around 32-34°C, and minimum temperature (T_{min}) of around 20-22°C.
Assam: Central Brahmaputra Valley Zone (Marigaon, Nagaon)	Total up to 55 mm rainfall is expected during 10-13 May, 2022. Maximum temperature is expected to be around 32-35°C, minimum temperature of around 21-22°C.
Assam: Lower Brahmaputra Valley Zone (Goalpara, Dhubri, Kokrajhar, Baongaigaon, Barpeta, Nalbari, Kamrup, Baksa, Chirang)	Total up to 65 mm rainfall is expected during 10-13 May, 2022. Maximum temperature is expected to be around 30-32°C, minimum temperature of around 21-23°C.
Bihar: Agro-climatic Zone II (Northern East (Purnea, Katihar, Saharsa, Supaul, Madhepura, Khagaria, Araria, Kishanganj)	Total up to 70 mm rainfall is expected during 10-13 May, 2022. Maximum temperature is expected to be around 34-36°C, minimum temperature of around 23-25°C.
Odisha: North Eastern Coastal Plain (Balasore, Bhadrak, Jajpur)	Total up to 170 mm rainfall is expected during 10-13 May, 2022. Maximum temperature is expected to be around 33-35°C, minimum temperature of around 22-23°C.
Odisha: North East and South Eastern Coastal Plains Region (Kendrapara, Khurda, Jagatsinghpur, Puri, Nayagarh, parts of Cuttack, and parts of Ganjam)	Total up to 24 mm rainfall is expected during 10-13 May, 2022. Maximum temperature is expected to be around 34-36°C, minimum temperature of around 24-26°C.

Source: IMD (<https://mausam.imd.gov.in/>) and www.weather.com

II. Agro-advisory of Jute

1. Those who has sown the crop between April 26-May 10: (Crop Age 15-30 days)

- ❖ Apply one light irrigation followed by (after 2-3 days depending on soil moisture condition) mechanical weeding with scraper or ICAR-CRIJAF Nail Weeder or Single Wheel Weeder. Maintain the plant population (50-60 plant/m²) by thinning. After weeding and thinning, apply top dressing of Nitrogen fertilizer @ 20kg/ha in medium and high fertile soil (20 DAS). In case of low fertile soil apply Nitrogen @ 27kg/ha.
- ❖ For post emergence grass weed control, spray Quizalofop ethyl 5 EC @ 1.0 ml/L of water at 8- 10 days after sowing or Quizalofop ethyl 10EC @ 0.75 ml/lit at 15 days after sowing.
- ❖ The farmers are advised to be vigilant on the infestation of indigo caterpillar particularly in the newly emerged seedlings which are cut from the ground level. The infestation will be more after rain or irrigation. The larva hides below the clods in the base of the plant. For control of indigo caterpillar (i) Install pheromone traps @15/ha before sowing to attract male moths and inhibit (ii)collect egg masses from field and destroy (iii) Spray of chlorpyriphos 20 EC @2ml/L or profenophos 50EC@2ml/L to kill early instar larvae or Spraying of indoxacarb 14.5%SC 0.5ml/L or spinosad 45%SC 0.3ml/L or emamectin benzoate 5% SG 0.2gm/L (iv) Spray SI NPV @ 250LE during evening time.
- ❖ Collar rot might appear at this stage caused by fungi like *Rhizoctonia* or *Macrophomina* or both due to dry soil condition. Irrigate the field and subsequently spray Copper Oxychloride (Blitox 50WP) @ 0.5% solution if incidence is more than 5%. For this sprayer nozzle should be directed towards base of the plants.



Use scraper or Nail Weeder or single wheel weeder at 21 days after sowing



To control indigo caterpillar
(i) Install pheromone traps @15/ha before sowing to attract male moths and inhibit
(ii)Collect egg masses from field and destroy
(iii) Spray of chlorpyriphos 20 EC @2ml/L or profenophos 50EC@2ml/L to kill early instar larvae or Spraying of indoxacarb 14.5%SC 0.5ml/L or spinosad 45%SC 0.3ml/L or emamectin benzoate 5% SG 0.2gm/L (iv) Spray SI NPV @ 250LE during evening time.



Collar rot caused by fungi due to dry soil condition. Apply copper oxychloride @0.5% solution if incidence is >5%.

2. Jute crop sown during April 11-25: Crop Age- 30-45 Days

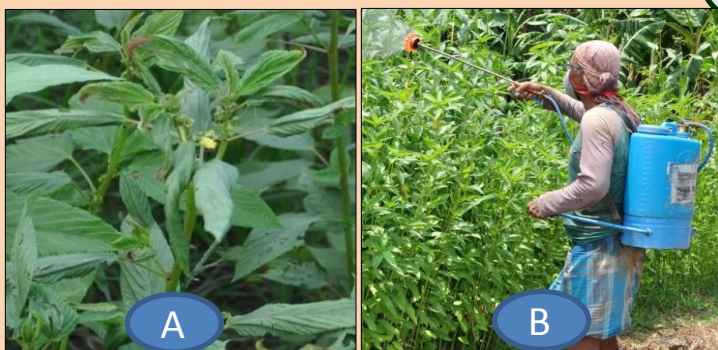
- If last top dressing is due, apply 20 N/ha under assured moisture condition or apply one irrigation after top dressing at 40-45 DAS and maintain 50-55 plants/square meter.
- During excess rain due to 'Norwester' / 'Cyclonic Depression' the field may be waterlogged that adversely affect crop growth. Remove excess water from field immediately creating field ditches (20 cm wide and 20 cm depth) along the gradient at 10 m intervals.
- Unopened tender leaves of 30-50 day old jute crop may be damaged by grey weevils usually after rain. The damage portions in leaves broaden as the plant grows. Weevils are grey in colour with dark white spots, elongated head, visible on plants. Spray combination of (Chlorpyrifos 50 EC + Cypermethrin 5 EC) @ 1-1.5 ml/l or Chlorpyrifos 20 EC @ 2ml/litre or Quinalphos 25 EC@1.25 ml/litre.
- Alert about the initial infestation of hairy caterpillar after rain when the temperature raises with high humidity. Eggs and young larvae are seen in bunch on the leaf surface. The pest spreads quickly and damage the leaves. Monitor to spot early infestation. Remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC@ 1.5 ml/lit or profenophos 50EC @ 2ml/l in extreme cases.
- The mite insect appears at 30-35 DAS with the symptom of thickening and interveinal crinkling in the terminal young leaves which later turn coppery-brown. Avoid water stress, maintain soil moisture at field capacity to reduce the damage by mite infestation. Foliar spray of Fenpyroximate 5 EC @ 1.5 ml/litre or Spiromesifen 240 SC @ 0.7 ml/litre or Propargite 57 EC @ 2.5 ml / litre alternatively in rotation at 10 days interval if infestation persist beyond 10 days. In case of rain, wait for at least 5-6 days to initiate the Acaricide spray if symptoms initiates/persists



- Infestation of grey weevils usually after rain.
- Spray combination of Chlorpyrifos 50EC+cypermethrin 5EC @ 1-1.5 ml/l or Chlorpyrifos 20EC @ 2ml/l or Quinalphos 25 EC@1.25 ml/l



Hairy caterpillar infestation with high temperature and humidity after rainfall. The pest spreads very quickly. Monitor to spot early infestation and remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC@ 1.5 ml/lit or profenophos 50EC @ 2ml/l in extreme cases.



A. Mite infested crop at 30-35 days after sowing
B. Avoid water stress, maintain soil moisture and foliar spray of Fenpyroximate 5 EC @ 1.5 ml/litre or Spiromesifen 240 SC @ 0.7 ml/lit or Propargite 57 EC @ 2.5 ml / lit alternatively in rotation at 10 days interval

3. Timely sown jute crop (March 25 to April 10): Crop Age: 45-60 Days

- During excess rain due to 'Norwester' / 'Cyclonic Depression' some field may be waterlogged that adversely affect crop growth. Remove excess water from field immediately by creating field ditches (20 cm wide and 20 cm depth) along the gradient at 10 m intervals. At optimum condition maintain plant population (55-60 plants/square meter).
- Closed tender leaves of 40-50 day old jute crop may damaged by grey weevils usually after rain. The damage portions in leaves broaden as the plant grows. Weevils are grey in colour with dark white spots, elongated head, visible on plants. Spray combination of (Chlorpyrifos 50EC+Cypermethrin 5EC) @ 1-1.5 ml/l or Chlorpyrifos 20EC @2ml/litre or Quinalphos 25 EC@1.25 ml/litre
- Farmers should also be remain alert about infestation of hairy caterpillar after rain when the temperature and relative humidity raises. Eggs and young larvae are seen in cluster on the leaf surface. The pest spreads quickly and damage the leaves. Early monitoring to spot early infestation is required. Remove the egg masses and newly emerged larvae in bunch. Spray Lambda Cyhalothrin 5EC@ 1.5 ml/lit or Profenofos 50EC @ 2.0 ml/litre in extreme cases.
- If drought prevails mite infestation with the symptom of thickening and interveinal crinkling in the terminal young leaves which later turn coppery-brown. Avoid water stress and foliar spray of Fenpyroximate 5 EC @ 1.5 ml/litre or Spiromesifen 240 SC @ 0.7 ml/litre or Propargite 57 EC @ 2.5 ml / litre alternatively in rotation at 10 days interval if infestation persist beyond 10 days. In case of rain, wait for at least 5-6 days to initiate the Acaricide spray if symptoms initiates/persists
- Another insect, semilooper causes foliar damage in almost all the jute growing tracts. Slender, greenish larvae with light yellow head, narrow dark green dorsal lines are easily noticed when they crawl by producing a loop in the middle. The crop is most susceptible at 50-80 DAS. Damage starts in all cases from unopened leaves in upper part of the plant which represent the most susceptible portion. Damage is restricted to 9 fully opened leaves of the crop. The edges of the tender leaves are eaten, serrated, diagonal cuts occurs in apical leaves. Sometimes damaged stem induce branching. Whenever the damage by semilooper reaches 15% then any contact insecticide such as Profenophos 50 EC @2 ml/litre, Fenvalerate 20EC @ 1.0 ml/litre or Cypermethrin 25EC @ 0.5 ml/litre may be applied. The insecticidal sprays need to be targeted towards the apical portion of the plant rather than covering the whole plant.



Timely sown (50-60 days old) jute crop

Control of grey weevils with Spray combination of Chlorpyrifos 50EC+cypermethrin 5EC @ 1-1.5 ml/l or Chlorpyrifos 20EC @2ml/l or Quinalphos 25 EC@1.25 ml/l



Hairy caterpillar infestation with high temperature and humidity after rainfall. The pest spreads very quickly. Monitor to spot early infestation and remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC@ 1.5 ml/lit or Profenophos 50EC @ 2.0 ml/l in extreme cases.

If damage by semilooper reaches 15% then any contact insecticide such as Profenophos 50 EC @2 ml/litre, Fenvalerate 20EC @ 1.0 ml/litre or Cypermethrin 25EC @ 0.5 ml/litre may be applied. The insecticidal sprays need to be targeted towards the apical portion of the plant rather than covering the whole plant.



A. Mite infested crop at 30-35 days after sowing

B. Avoid water stress, maintain soil moisture and foliar spray of Fenpyroximate 5 EC @ 1.5 ml/litre or Spiromesifen 240 SC @ 0.7 ml/litre or Propargite 57 EC @ 2.5 ml / litre alternatively in rotation at 10 days interval

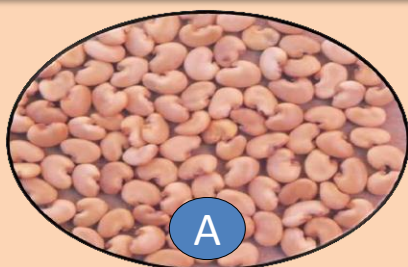
III. Agro-Advisory for Allied Fibres

A) SUNNHEMP



1. Those who have not yet sown the sunnhemp crop

- ❖ Maximum and minimum temperature is predicted to be 39-41°C and 23-24°C, respectively and negligible rainfall is likely to occur during next one week in sunnhemp growing areas of U.P.
- ❖ The farmers are advised for land preparation and sowing of sunnhemp with a pre-sowing irrigation if sufficient soil moisture is not there.
- ❖ Sowing must be done with certified seed of improved varieties of sunnhemp such as Prankur (JRJ 610), Ankur (SUIN 037), Shailesh (SH-4), Swastik (SUIN 053) and K-12 (Black)
- ❖ Seed treatment with Carbendazim @ 2g/ kg seed before sowing is recommended as it protects the crop from seed borne diseases.
- ❖ Line-sowing with row to row spacing of 20 cm and plant to plant spacing of 5 – 7 cm at the depth of 2-3 cm. A seed rate of 25 kg/ha for line sowing and 35 kg/ha for broadcasting is recommended.
- ❖ Basal dose of N: P₂O₅: K₂O :: 20:40-50:40 kg/ha is recommended for sowing and should be mixed thoroughly with soil during final tilth.
- ❖ When sowing of sunnhemp is done for the first time in that land, seed need to inoculated with rhizobium culture(for better nodulation) and dried in the shade for 30 minutes before sowing.



Sunn hemp seed
A. K-12 yellow
B. Shailesh (SH 4)



A. Seed treatment with carbendazim @2g/kg seed or carbendazim 12% + mancozeb 63 %
B. Land preparation and sowing



2. Timely sowing of Sunnhemp crop (April 26-May 10) (crop age 15-25 Days)

- ❖ In case of prolong drought after sowing, leaf hopper infestation may happens, apply one light irrigation.
- ❖ After irrigation one scrapper/ wheel hoe or hand weeding may be given after 15-20 days of sowing in between rows to control weeds, thinning of excess plants need to be done to maintain optimum plant population (55-60 plant/sq.m).
- ❖ The farmers are advised to be vigilant on the infestation of stem girdler or hairy caterpillar. If infestation observed, spraying of Chlorpyriphos 20 EC @ 2ml/l is recommended.



25 Days old sunnhemp crop

Weeding and thinning, protective spray with chlorpyriphos 20 EC @ 2ml/litre



Leaf hopper affected seedlings under drought condition

3. Farmers sown the crop in Mid-April (Crop age: 25-40 days)

- Under water stress, one light irrigation is advocated. On the other hand if heavy rainfall occurs, immediate removal of water through proper drainage is required.
- One hand weeding after irrigation is required at 25 days after sowing for better growth and maintain plant population (55-60 plant/sq. meter).
- Under drought stress, flea beetle infestation may occurs which feeds on the leaves making small holes. Farmers to be vigilant on the infestation of hair caterpillar, if substantial infestation observed, spraying of Chloropyriphos 20EC @ 2ml/litre or any Neem based formulations @ 3-4ml /litre is recommended.



40 days old sunnhemp crop



Flea beetle infested crop



Crop affected by hairy caterpillar

B) Mesta



Kenaf



Roselle

1. Sowing of mesta during last week of May

- Farmers are suggested to go for land preparation and the sowing process of Mesta (Roselle and Kenaf). For Roselle, Variety like AMV-5, MT-150 and HS-4288 and for Kenaf variety like JRM-3 (Sneha) and JBM81 (Shakti) should be used to get good yield. The seed should be treated with Carbendazim @2g kg⁻¹ seed at least 4 hours before sowing.
- Seed Rate for Broadcasting should be 15 kg ha⁻¹ and 12 kg ha⁻¹ for Line sowing. Line sowing should be at spacing of 30 x 10 cm and at a depth of 2-3 cm to obtain desired plant population. Laddering of field after sowing which will act as dust mulch for conservation of soil moisture which will be helpful for better germination of seed.
- The recommended fertilizer for rainfed conditions is N:P₂O₅:K₂O::40:20:20 kg ha⁻¹ and N:P₂O₅:K₂O::60:30:30 kg ha⁻¹ under irrigated conditions. Nitrogenous fertilizer needs to be applied in 2-3 spilt dose. However, phosphorus and potash should be applied as basal along with 5t FYM/ha. Farmers can also refer Soil Health Card for actual NPK requirement as per their soil test report.
- Under rainfed conditions, pre emergence application of Butachlor 50% EC @ 4 ml/Litre water after 24-48 hrs of sowing to control weeds and pre emergence application of Pretilachlore 50 EC @ 3 ml/Litre water after 40-48 hrs of sowing to control weeds under irrigated conditions and spray solution of 500-600 litres water/ha is necessary.
- For crop insurance strip cropping (4:4) of mesta/roselle with ground nut, blackgram and maize are advocated



Land preparation and basal dose of NPK fertilizer application for mesta cultivation



Seed treatment with Carbendazim (1g per kg seed), at least 4 hours before



Open furrows developed by nine tyne cultivators for rainfed sowing for *in situ* soil water conservation

C) SISAL

Introduction: Sisal (*Agave sisalana*) is a xerophytic semi-perennial, leaf fibre producing plant. Sisal fibre is commonly used in the shipping industry for mooring small craft, lashing, and handling cargo. Presently the main sisal producer and exporter is Brazil and main importer is China. In India, sisal is mainly grown in arid and semi-arid regions of Andhra Pradesh, Bihar, Orissa, Karnataka, Maharashtra and West Bengal. The yield of sisal in our country is very low, due to lack of proper management. The total area under sisal cultivation is 7770 ha out of which 4816 ha is grown under soil conservation purpose. Suitability to the Indian climate with little water requirement and maintenance, makes sisal a fit crop for sustainable development in the country particularly in rural India. Sisal, a CAM plant, can be successfully grown in 40-45°C with 60-125 cm rainfall. The cultivation of sisal and its allied activities will augment the employment opportunities and livelihood security of tribal/local farmers through generation of man days (113 man-days/ha) and promotion of cottage industries through value addition. Besides, sisal is efficient in reducing runoff by 34.6%, soil loss by 61.9% and conserve soil moisture.

Primary Nursery

- Generally bulbils are collected between March and May every year which varies from species to species and location. The collected bulbils after grading are planted in primary nursery having dimension of 1m width and length as per convenient considering the slope with spacing of 10cm x 7cm with escapement of 30cm x 30cm in the field.
- The mulching may be provided to check the weed growth and to reduce the water requirement resulting proper growth and development of desired suckers in nursery for planting in main field.
- Application of metolachlor @ 0.5 kg/ha at 1 DBP can control the weeds followed by 1 hand weeding will be helpful to keep the nursery weedy free for production of quality planting materials.

Collection of Sucker from Main Field

- In addition to growing of bulbil in primary nursery followed by secondary nursery to produce the sucker as planting material, sisal sucker can also be collected from the main plantation. Generally, 2-3 suckers are produced per annum, which is also a potential source of planting material and can be directly planted in the main field. These suckers are uprooted after the onset of the monsoon. The old roots should be trimmed and damaged withered leaves also should be removed before planting. Care should be taken so that bole (crown region) of the plant is not damaged during trimming of old roots.

Maintenance of New Sisal Plantation

- Weeding should be done in 1-2 years old sisal plantation to reduce competition for nutrient and water. Spraying of Copper oxy-chloride @3.0 g/lit or Mancozeb 64% + Metalaxyl 8% @ 2.5 g per litre of water in case of appearance of first symptom of the zebra disease or alternaria leaf spot of sisal should be taken up. Application of sisal compost 2 ton/ha with 60:30:60 kg/ha should be taken up immediately for optimum growth and yield. Fertilizer should be applied by making ring around the sisal plant at least in the first year of plantation.



Harvesting of leaves (A), fibre extraction (B), collection of bulbil and raising of primary nursery (C) and Spraying of Copper Oxychloride @ 2-3 g/litre water to control Zebra disease of sisal (D)

Sisal plantation in the Main field

- Suckers raised in the secondary nursery or collected from sisal plantation should be planted in main field after trimming/ pruning of older lower leaves and roots after treatment with Mancozeb 64% + Metalaxyl 8% @ 2.5 g per litre of water for 20 minutes. Suckers should be planted in a hole made in the center of the pits with the help of sharp pointed wood/ho. The suckers neck region should be at ground level.
- The suckers should have length greater than 30 cm, weight of at least 250 g and having 5-6 leaves. Suckers having any disease and/or stress symptoms should be avoided for planting.
- Sisal compost or FYM @ 5 tonnes/ha and N: P₂O₅: K₂O:: 60:30:60 Kg/ha should be applied for rapid development of sisal plant. Nitrogen should be applied in two equal splits: 50 % during pre-monsoon period and rest during post-monsoon period and the post-monsoon dose should be started immediately taking the advantage of soil moisture.
- Farmers who have not prepared main field for sisal plantation till now, may go for planting without further delay selecting well drained field having minimum soil depth of 15 cm. The entire should not be ploughed, when sisal plantation is taken in sloppy land.
- Demarcation of land for the main field, cleaning of bushes, removal of weeds and pitting of 1 ft³ size with spacing 3.5 m + 1m × 1m for Double-row sisal plantation should be done and about of 4500 suckers per hectare are required. However, even planting can also be taken at spacing of 3.0 m + 1m × 1m under adverse situation with plant population of 5000 per hectare.
- Pit should be filled up with mixture of soil and sisal compost or FYM for making soil porous. Lime should also be applied as soil amendment @ 2.5 tonnes per hectare in acidic soil and the filling of soil in the pit should be 1-2 inch above the ground level for proper establishment of the suckers.
- Sisal suckers should be planted across the slopes and parallel to the contours to check soil erosion. Suckers should not be kept in heap and should be kept in single layer under shade for better survival. The planting of the suckers is to be completed within 45 days of collection. Atleast 100 suckers per hectare should be kept as reserve for gap filling to maintain required plant population.
- Sisal Suckers raised in the secondary nursery should be preferred as planting material compared to sucker obtained from sisal plants from main field to have uniform crop stand.

Collection of bulbils

Growth of Sisal plant is terminated with emergence of flowering stalk know as pole. Each pole contains about 200-500 bulbils, consisting of 4-7 reduced leaves. The same should be collected and raised in primary nursery as planting material

Harvesting of Sisal Leaves

The harvesting leaves should be completed without further delay as rising temperature will affect negatively the sisal fibre recovery. Harvesting of leaves should be taken up in afternoon hours and extraction should also be completed in the same day. Spraying of Copper Oxylchloride @ 2-3 g/litre water may be taken up against disease infestation after harvesting of leaves.

Intercropping in sisal plantation for additional income

Life-saving irrigation and plant protection measures should be provided to intercrops like watermelon and cashewnut and mango, which can be successfully grown in interspace of double row sisal plantation and thereby additional net income of Rs. 52,000 /- per hectare and Rs. 27,000 /- per hectare can be generated. Similarly, in sisal-based fruit fibre system, plant protection measures should be taken for mango and additional net income of Rs 64,000/- can be obtained per hectare.



Intercropping 1. water melon 2. Cashew 3. Mango

Sisal based Integrated Farming System

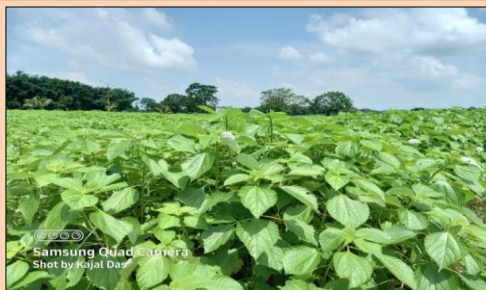
Integrated Farming System in Sisal Plantation can be adopted successfully as a profitable venture in Tribal and Drought Prone areas for employment generation, enhancing farm income and sustainable agriculture. The efficient use of available resources will help in generating adequate income due to integration of various farm enterprises and recycling of crop residue and by products within the system itself. Various animal components and crop components along with base crop sisal can be successfully integrated in Sisal based IFS system.

1. Backyard poultry can be incorporated by rearing 100 nos. improved breeds of chicks like Vanaraja, Red Rooster and Kadaknath with net profit of Rs. 8,000-10,000 /- per annum.
2. Farmers can add net profit of Rs. 25,000/- per annum by taking dairy activities with two cows and the cows can be fed with different fodder crops including the other crop residues taken in interspace of double row sisal plantation.
3. An additional net income of Rs. 12,000-15,000 /- per annum can be generated by rearing 10 nos goats.
4. Mushroom Cultivation with six beds can also be taken up with the toe fibre and paddy straw of aerobic rice, grown in the interspace of sisal, resulting in net income of Rs. 12000/- per year.
5. The vermicomposting can be taken up utilizing the sisal waste, other crop residues and leftover material of mushroom cultivation for raising different intercrops as well as for the main crop sisal, thereby reducing the cost on fertilizer and improving soil health with additional net income of Rs. 14,000 /per annum.
6. As sisal is generally grown in sloppy and undulated land, rain water can be profitably harvested. Moreover, taking into consideration of irregular and scanty rainfall and lack of persistent and sustained irrigation facilities, the construction of rainwater harvesting structures can empower sisal growers by providing additional net income through multiple uses of the harvested water. The water harvesting structure should be constructed at the lowest corner of the field in an area of 0.1 Hectare out of 1-hectare total sisal plantation. The dimensions of the structure if 30 m x 30 m x 1.8 m with embankment width of about 1.5 m. The harvested rainwater in this tank can be utilized in multiple way and has following advantages:
 - ❖ The harvested water can be utilized for providing supplementary irrigation at critical stage of intercrops as well as base crop sisal for getting additional income and to increase the production and productivity of the sisal-based cropping system.
 - ❖ The stored water can be utilized for proper washing of fibre during extraction process of sisal.
 - ❖ Profit of about Rs. 15,000-20,000 /- per annum can be generated through dike height horticulture such as papaya, banana, coconut, drumstick and other seasonal vegetables:
 - ❖ Composite Pisciculture actives can be taken up in water harvesting structures by rearing catla, rohu and mrigal, by which the farmers can earn Rs. 10,000-12,000 /- per annum.
 - ❖ An additional income of about Rs. 8,000 per annum can be obtained by rearing 100 nos ducks in the water body.



Sisal based Integrated Farming System at Bamra, Odisha

D) RAMIE



- ❖ Farmers may start new plantation with the onset of rain. Stage back operation is recommended for old plantation followed by application of fertilizers and irrigation for uniform growth and better yield.
- ❖ Use good quality rhizomes/ plantlets of R1411 (Hazarika) variety of ramie. Seed treatment with any systemic fungicide before sowing is recommended. Sowing should be done in line and required seed rate will be only 6-8q rhizome/ha or 55,000 – 60,000 plantlets or stem cuttings/ha.
- ❖ Land should be prepared by 3-4 cross ploughing followed by planking. Make a furrow of about 4-5 cm deep. 10-12 cm length pieces of rhizome/ plantlet/ stem cutting are to be planted in the furrow at a distance of 30-40 cm by keeping the row to row distance 60-75 cm.
- ❖ Inter row space may be utilize for intercropping with pineapple, papaya, coconut, areca nut.
- ❖ Integrated applications of organic (FYM or Ramie compost as per availability) and inorganic sources of nutrients are recommended for balanced nutrition to the crop and for maintaining good soil health. Application of 20:10:10 kg NPK/ha after 40-50 days of planting is recommended. Subsequently 30:15:15 kg NPK/ha after each cutting is recommended. Apply 10-12 t FYM before 15-20 days of planting as per the availability.
- ❖ Based on the incidence of insect-pests and diseases spraying of 0.04% Chlorpyriphos and Mancozeb @2.5 ml/litre or Propiconazole @ 1 ml/lit are recommended, respectively.
- ❖ Timely harvesting of ramie crop is most important operation, which is to be done after every 45-60 days old crop (for old plantation). Over maturity leads to poor quality fibre and may fetch poor market price.
- ❖ Spraying of non-selective and non-residual herbicide after cutting is recommended for complete destruction of all weeds.
- ❖ Spraying of Quizalofop Ethyl 5% EC @ 40 g a.i./ha is recommended 20 days after harvesting significantly reduces all grassy weeds.
- ❖ The crop is very sensitive to water-logging, therefore provision of drainage may be kept and field should be well drained during heavy rains.



Planting materials- rhizomes and plantlets

Planting of rhizomes

Harvesting of ramie crop



Defoliation of leaves after harvesting

Ramie fibre extraction

Drying of extracted fibre after extraction (ungummed)



***In-situ* Jute Retting Tank based Self Reliant Eco-farming System**

- ❖ Keeping in view the erratic distribution of rainfall, non-availability of community retting tank, declined per capita availability of water resources, high cost of cultivation and labour and dryness of rivers, ponds/canals, farmers face problems of proper retting of jute and mesta. Due to retting with poor quality water of community pond and sometimes with insufficient water, quality of fibre is affected and is not internationally competitive.
- ❖ To overcome such problems, in-situ retting tank based farming system model can be adapted by the farmers before rainy season to make jute and mesta farming more profitable. Since the rainfall of jute growing states are high, ranges from 1200 to 2000 mm and 30-40% of the rainfall goes as runoff, some portion of runoff water can be harvested by constructing a tank in the lower most corner of the the field.

Dimension of the Pond and Retting Process for one acre of harvested raw jute

- ❖ The pond dimension of 40 ft × 30 ft × 5 ft was sufficient for retting of jute harvested from half acre of land at a time. Jute harvested from one acre can be used for retting easily in two cycles. The pond bund should have sufficient width (1.5-1.8 m) to grow plants like papaya, banana and vegetables. The total area of farming system which includes digging and bund area will be 180 m². If farmers want to afford more land under farming system, pond dimension of 50 ft x 30 ft x 5 ft can be adopted
- ❖ Provision should be made for appropriate lining of in-situ retting tank with LDPE agri-film of 150-300 microns to minimize the seepage and percolation loss, particularly in light textured soil.
- ❖ Three jaks should be prepared at a time and each jak should consist of three layers. Gap of 20-30 cm from jak to the soil bottom and 20-30 cm water above the jak should be maintained.

Advantages of in-situ retting tank

- ❖ The cost of transporting the harvested jute bundles to the conventional retting spot (about Rs. 4000 - 5000/ acre) can be saved by constructing in-situ retting pond.
- ❖ By using CRIJAF Sona, retting can be completed with in 12 to 15 days compared to 18 to 21 days under conventional retting. CRIJAF Sona @14 kg per acre should be used for retting purpose. During 2nd cycle retting, dose of CRIJAF Sona can be reduced to 50% by which Rs. 400/- can also be saved.
- ❖ Fibre quality can be improved by at least one to two grades because retting will be performed in freshly harvested rainwater and also with free flowing rainwater of the rainy season.

In addition to retting of jute and mesta, the harvested water can be utilized in multiple ways

1. Dyke based horticulture (papaya, banana, seasonal vegetables (Profit of about Rs. 10,000-12,000/- per tank **2.** Rearing of air breathing fish like telapia, magur and singhi, 50-60 kg **3.** Apiaries (Profit from honey around Rs. 7000/- per tank) and also honey bees will help in pollination **4.** Mushroom cultivation and vermicomposting. **5.** Approximately 50 nos. ducks can be reared in the pond which result in additional income of Rs. 5000 /-. **6.** After retting, the water can be utilized for providing supplement irrigation to crops in jute based cropping sequence resulting additional income of Rs 4000/acre.

Thus, by loosing jute of Rs. 1000 to 1200 after construction of in-situ retting tank in the field, farmers can earn about Rs. 30,000/- in that area from multiple farming with saving of transport cost another about Rs. 4000-5000/- This technology will also be helpful in reducing negative impacts from extreme weather events like drought, cyclone, flood etc.

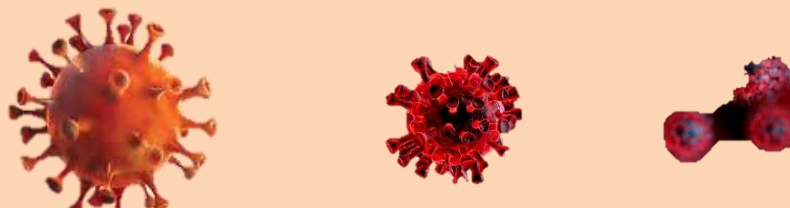


In-situ Jute Retting Tank based Self Reliant Eco-farming System

- ❖ Jute Retting
- ❖ Fish culture
- ❖ On-dyke Vegetable farming
- ❖ Vermicomposting around retting tank

- ❖ Duckery
- ❖ Apiculture
- ❖ Fruit (Papaya and Banana)

IV. Safety and Preventive Measures to be Taken to Prevent Spread of COVID-19 Virus



- 1) Farmers should follow social distancing, safety measures and to maintain personal hygiene by washing hands with soap, wearing of face mask and protective clothing at each and every step in the entire process of field operations like land preparation, sowing, weeding, irrigation.
- 2) Proper sanitation and cleanliness of machine like sickle, seed drill, nail weeder, irrigation pump, tilling equipment, tractor etc. are to be maintained especially when machines are shared and used by farmer groups.
- 3) Also maintain safe distance of 6 feet during rest, taking of meals, seed treatment at home, loading/unloading of manures and fertilisers.
- 4) Engage only familiar persons to the extent possible and after reasonable enquiry as to avoid the entry of any suspect or likely carrier during field activity.
- 5) Collect the seed, fertilizer, pesticides and other inputs from known shop and after returning from market immediately wash your hands and exposed parts of the body. Always use face masks while going market for seed purchase.
- 6) Install **Aarogya Setu** app in your mobile to know the essential health services related to COVID-19



VI. Advisory for jute mill workers



- The workers staying inside the mills may be engaged in multiple numbers of short duration shifts (with minimum number of workers/shift) for running the mills in staggered manner.
- In general adequate numbers of washing points are to be given inside the mills so that the workers can wash hands more frequently. During the duty the workers should not smoke.
- The toilets must be cleaned, sanitized for more number of times to check the spread of virus infection.
- The workers are advised to use gloves, face mask, shoes, proper protective clothing while working in the mill.
- Inside the mill, the working points to be relocated so that sufficient distances are maintained among the workers as per the need of social distancing to suppress the transmission of the virus.
- The workers who are exposed to working surfaces more frequently, most of the time touch and handle important points of machines like switches, levers etc. should be extra precautions in hand sanitization and hand washing with soap. Besides, such surfaces and machine parts should be cleaned with soap water to remove the infective virus.
- The aged high risk workers should be allowed to work in more isolated places inside the mill premises so that their chances of exposure to others is reduced to great extent.
- The mill workers must avoid gathering during tiffin/lunch hours, must maintain 6-8 ft distance between two individuals and wash their hands properly before taking foods.
- The workers must report the doctor or the mill owners immediately in case any type of symptoms related to the COVID infection

Wish you all a healthy and safe stay

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