

AGRO-ADVISORY TO GROWERS OF JUTE AND ALLIED FIBRES

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**भा.कृ.अ.प. -केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान
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**Agro-advisory to Farming Community of Jute and Allied Fibres
(15 June-24 June, 2020)**

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

State/Agroclimatic Zone/Region	Weather Forecast
Gangetic West Bengal (Murshidabad, Nadia, Hoogly, Howrah, North 24-Prganas, Purba Burdwan, Paschim Burdwan, South 24-Parganas, Bankura, Birbhum)	Light to moderate rainfall is expected during 15-18 June, 2020 (total rain upto 18 mm). Maximum temperature (T_{max}) is expected to be around 32-34°C, and minimum temperature (T_{min}) of around 26-28°C.
Sub-Himalayan West Bengal (Cooch Behar, Alipurduwar, Jalpaiguri, North Dinajpur, South Dinajpur and Malda)	Heavy rainfall is expected during 15-18 June, 2020 (total rain upto 165 mm). Maximum temperature (T_{max}) is expected to be around 30-32°C, and minimum temperature (T_{min}) of around 25-26°C.
Assam: Central Brahmaputra Valley Zone (Marigaon, Nagaon)	Light to heavy rainfall is expected during 15-18 June, 2020 (total rain upto 119 mm). Maximum temperature is expected to be around 30-33°C, minimum temperature of around 23-24°C.
Assam: Lower Brahmaputra Valley Zone (Goalpara, Dhubri, Kokrajhar, Baongaigaon, Barpeta, Nalbari, Kamrup, Baksa, Chirang)	Light to heavy rainfall/thunder shower is expected during 15-18 June (total rain upto 129 mm). Maximum temperature is expected to be around 31-34°C, minimum temperature of around 23-27°C.
Bihar: Agro-climatic Zone II (Northern East) (Purnea, Katihar, Saharsa, Supaul, Madhepura, Khagaria, Araria, Kishanganj)	Light to heavy rainfall/thunder shower is expected during 15-18 June, 2020 (total rain upto 98 mm). Maximum temperature is expected to be around 27-33°C, minimum temperature of around 24-26°C.
Odisha: North Eastern Coastal Plain (Balasore, Bhadrak, Jajpur)	Light to moderate rainfall is expected during 15-18 June, 2020. Maximum temperature is expected to be around 31-34°C, minimum temperature of around 25-27°C.
Odisha: North East and South Eastern Coastal Plains Region Kendrapara, Khurda, Jagatsinghpur, Puri, Nayagarh, parts of Cuttack, and parts of Ganjam	Light to moderate rainfall is expected during 15-18 June, 2020 (total rain upto 31 mm). Maximum temperature is expected to be around 32-34°C, minimum temperature of around 24-27°C.

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

II. Agro-advisory for Jute Crop

1. Timely sown jute crop at 25 March-10 April (Crop age: 80-90 days)

- Under warm and humid condition leaf infection by *Macrophomina phaseolina* may occurs which ultimately infect the stem through petioles and leaf margin causing stem rot disease. Foliar spray with systemic fungicide like Carbendazim @ 2 g/litre may apply at 20 days interval. Waterlogging may increase the stem rot/root rot, therefore, proper drainage is essential. Remove the affected plants and plant with lanky growth which do not add any effective fibre yield. Avoid jute - potato rotation and apply lime in acidic soil @2-4 ton/ha before sowing.
- Infestation of hairy caterpillar after rain when the temperature and relative humidity raises may occurs. 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@ 1ml/lit or Indoxacarb 14.5 SC@ 1.0 ml/litre in extreme cases.
- 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.
- Under emergency condition when removal of stagnant water from low land jute field is not possible and the crop is 80-90 days old, farmers may harvest the crop to realize 50-60 % of normal fibre yield. This exceptional practice may partly meet his investment on jute cultivation.



80-90 days old crop

Severe incidence of stem rot /root rot in farmers' field in Hoogly district of West Bengal. Integrated approach of control from next seasons: (a) application of lime in acidic soil @2-4 ton /ha (b) avoid Potato – Jute sequence (c) seed treatment with Carbendazim @2g/kg or Trichoderma @10g/kg seed (d) avoid water logging in the field (e) at initial stage foliar spray of carbendazim @ 2g/litre



Harvesting of 80-90 days old crop where removal of stagnant water is not possible under low land condition.



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@ 1ml/litre or Indoxacarb 14,5 SC@ 1.0 ml/litre in extreme

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.



2. Jute sown after 15 April (Crop Age: 70-80 days)

- In cyclone affected areas, water logging in jute field occurs that adversely affects the crop. Remove the stagnant water from the field by making suitable ditch along the slope and thereafter spray fertilizer mixture (2% DAP and 1% KCl-MOP) to boost the growth and vigour of the crop. The drained out water may be collected and store in nearby pond for future use.
- Infestation of hairy caterpillar after rain when the temperature and relative humidity raises may occurs. 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@ 1ml/lit or Indoxacarb 14.5 SC@ 1.0 ml/litre in extreme cases.
- 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.
- Under warm and humid condition leaf infection by *Macrophomina phaseolina* may occurs which ultimately infect the stem through petioles and leaf margin causing stem rot disease. One protective foliar spray with systemic fungicide like Carbendazim @ 2 g/litre may apply at 20 days interval. Waterlogging may increase the stem rot infection, therefore, proper drainage is essential.



Unaffected crop



70 -80 days crop affected by cyclone and heavy rain, remove water immediately and improve field condition



Under warm humid condition leaf infection by *Macrophomina phaseolina* may occur which ultimately causes stem rot / root rot diseases. Remedies: At this stage, avoid waterlogging, improve drainage and protective foliar spray with Carbendazim @ 2g/litre may be applied at 20 days interval.



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.

Hairy caterpillar infestation with high temperature and humidity after rainfall. The pest spreads very quickly. Monitor early infestation and remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC @ 1ml/lit or indoxacarb 14,5 SC @ 1.0 ml/l in extreme cases.



3. *In-situ* Tank based Farming System in Jute and Mesta

- 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 annual 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 facilitated for retting in two cycles.
- 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.
- 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. 3500 - 4000/ acre) can be saved by this method.
- There is a scope of completion of retting within 12 to 15 days using CRIJAF Sona 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 by taking advantage of the slow- moving water in the event of rainfall during the retting period.

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

1. Dyke height 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 permanent 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. 5000/- This technology will also be helpful in reducing negative impacts from extreme weather events like drought, cyclone, flood etc.



***In-situ* retting tank for jute and mesta based farming system**

Temporary Retting Pond

- Places where retting water is not available, alternatively temporary retting pond can also be created. For one bigha (0.13ha) jute, the pond size is 10.0m × 8.0m
- Fill the pond with ground water. Three days before jute steeping, add 50 kg sunnhemp twig, 100 kg old retting tank mud, 1 kg molasses and 1 kg ammonium sulphate for quick microbial culture development.
- Arrange jute bundles in 3 layers in alternate manner. As weight material put soil filled 40 cement bags over jute bundles.
- Drain out tanned water before fibre extraction from micro pond and refill it with fresh water. Continue the flow of water for one hour to remove remaining tanned water. Jute rets within 20-27.
- Use of CRIJAF Sona (4 kg) will reduce the retting duration by 4-5 days.
- After fibre extraction, dismantle the bunds, puddle the pond floor and transplant rice as usual.



Creation of temporary retting pond

4. Jute sown after 20 April (Crop Age: 50-60 days)

Water Management: During excess rain due to 'Cyclonic Depression' or monsoon rain many fields may waterlogged that adversely affect crop growth and predispose the crop to stem rot/root rot. Remove excess water from field immediately by creating field ditches (20 cm wide and 20 cm depth) along the gradient at 10 m intervals and improve the field conditions.

Crop Management: The fall in temperature during developmental stage with greater cloudy days may adversely affect vegetative growth. In case of slow growth, one foliar application of urea @2-4 % may be given (urea @2% by high volume sprayer or @4% by low volume sprayer)

Management of Pest and Diseases

- Infestation of hairy caterpillar after rain when the temperature and relative humidity raises may occurs. 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@ 1ml/lit or Indoxacarb 14.5 SC@ 1.0 ml/litre in extreme cases.
- 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.
- Under warm and humid condition leaf infection by *Macrophomina phaseolina* may occurs which ultimately infect the stem through petioles and leaf margin causing stem rot diseases. One protective foliar spray with systemic fungicide like Carbendazim @ 2 g/litre may apply at 20 days interval. Waterlogging may increase the stem rot infection, therefore, proper drainage is essential.

Intercropping: First harvesting of mung (intercrop with jute) may be done if pods are fully matured. Avoid harvesting in bad weather condition.



60 days old crop at different places of North and South Bengal



Different stages of stem rot (A)-leaf blight, (B) stem rot and (C) root rot: Apply foliar spray of Carbendazim @ 2g/litre at 20 days interval



Hairy caterpillar infestation with high temperature and humidity after rainfall. The pest spreads very quickly. Monitor early infestation and remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC@ 1ml/lit or indoxacarb 14,5 SC@ 1.0 ml/litre in extreme cases.

If damage by semilooper reaches 15% then 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.



Intercropping mung with jute



Harvesting of mung

5. Jute sown last week of April (Crop age: 45-55 days)

Water Management

- During excess rain due to monsoon or 'Cyclonic Depression' field may waterlogged that adversely affected the crop growth, fibre quality and aggravate the incidence of stem rot. Remove excess water from field immediately by creating field ditches (20 cm wide and 20 cm depth) along the gradient at 10 m intervals.

Pest and Disease Management

- Closed tender leaves of 30-50 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@ 1ml/lit or Indoxacarb 14,5 SC@ 1.0 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.



50-60 days old jute crop unaffected by cyclone



Water logged field, drain out stagnant water immediately





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@ 1ml/litre or Indoxacarb 14,5 SC@ 1.0 ml/litre in extreme

Control grey weevils infestation 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



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

If damage by semilooper reaches 15% then 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.



Damaged caused by severe cyclone and rain. Immediately remove water from the field and improve the field condition through inter cultural operation



6. Jute sown in first week May (Crop age: 40-45 days)

Water Management: During excess rain due to ‘Cyclonic Depression’ the field may be waterlogged that adversely affect the 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.

Nutrient Management: If last top dressing is due, apply 20 N/ha under assured moisture condition or apply one irrigation after top dressing and maintain 50-55 plants/square meter.

Pest and Disease Management

- 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 50EC+Cypermethrin 5EC) @ 1-1.5 ml/l or Chlorpyrifos 20EC @2ml/litre or Quinalphos 25 EC@1.25 ml/litre
- Farmers should be 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@ 1ml/lit or Indoxacarb 14.5 SC@ 1.0 ml/litre 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



Hairy caterpillar infestation with high temperature and humidity after rainfall. The pest spreads very quickly. Monitor early infestation and remove the egg masses and newly emerged larvae in bunch. Spray lambda cyhalothrin 5EC@ 1ml/litre or indoxacarb 14,5 SC@ 1.0 ml/litre in extreme cases.

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



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) SISAL

1. Preparation and maintenance of Secondary Nursery

- Bulbils raised in the primary nursery, should be planted in secondary nursery at a spacing of 50×25 cm after pruning of older lower leaves as well as roots and should be treated with Mancozeb 64% + Metalaxyl 8% @ 2.5 g per litre of water for 20 minutes.
- Bulbils should be planted in secondary nursery in rows with help of dibbler at a depth of 5 to 7.5 cm. The bulbils should be planted in such a way that neck region is at ground level. Every 11th row is skipped to facilitate weeding and other intercultural operation.
- Sisal compost or FYM @ 5 tonnes/ha and N: P₂O₅: K₂O:: 60:30:30 Kg/ha should be applied at the time of preparation of secondary nursery for rapid development of sisal plantlets in secondary nursery. Nitrogen should be applied in 3 spits- 1/3rd at basal, 1/3rd at 1st weeding (28 days after planting) and 1/3rd at 50-55 days after planting.

2. 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.
- Bunding around the field and ploughing in the interspace of sisal should be taken up for in- situ moisture conservation and checking surface run-off.



Secondary nursery



Ploughed field of one-year old sisal plantation



Double row sisal



Sisal sucker treated with fungicide before plantation

3. Sisal plantation in the Main field

- Suckers raised in the secondary nursery should be planted in main field after trimming/ pruning of older lower leaves and roots along with 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/hoes. The suckers should be planted in such a way that neck region is at ground level.
- The suckers should have length greater than 30 cm, weight of at least 250 g and consist of 5-6 leaves. Furthermore, suckers having any disease and/or stress symptoms should be avoided for planting.
- Farmers who have not prepared main field for sisal plantation till now, may select well drained field having minimum soil depth of 15 cm for sisal plantation. The entire field need 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.
- Pit should be filled up with mixture of soil and sisal compost or FYM for making soil porous. Lime should also be added @ 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.

4. Inter cropping in sisal plantation

- Crops like brinjal, ragi and palmarosa can be profitably grown in inter-space of doubled rowed sisal plantation for additional income. General maintenance and intercultural operations for existing fruit plants, raised in the sisal-based fruit fibre system should also be taken up.



Double row planting method



Intercropping with brinjal



Intercropping with sapota



Ragi in inter row space of sisal

B) RAMIE



- As per forecast, medium to heavy/ thunder showers are very likely to occur in Assam (Barpeta district) , therefore, provision of draining out of rain water is very much essential as the crop is very sensitive to waterlogging.
- Timely harvesting of ramie crop is most important operation, which is to be done after every 45-60 days old plant. Stem colour turns green to brown beyond this period, which is indication of over maturity of fibre and poor quality as well. Ramie farmers must be attentive to avoid this situation.
- Stage back operation is recommended in old plantation for uniform crop stand and followed by application of recommended dose of fertilizers i.e. 30-15-15 kg/ha of NPK.
- For new plantation gap filling may be done if uniformity in crop stand is not achieved.
- Application of Quizalofop Ethyl 5% EC @ 1.0 ml/litre significantly reduces all grassy weeds. Application should be based on intensity of weeds more especially grassy weeds.
- Insect pests like Indian red admiral caterpillar, Hairy caterpillar, Lady bird beetle, Termites, Leaf beetle and Leaf roller may be seen in the field. Based on the incidence of these pests spraying of 0.04% Chlorpyrifos is recommended.
- Diseases like Cercospora leaf spot, Sclerotium rot, Anthracnose leaf spot, Damping off and yellow mosaic may be seen during these times. Based on the occurrence of these diseases foliar spraying of fungicides such as Mancozeb @2.5 ml/litre or Propiconazole @1 ml/litre is recommended.



New ramie plantation

Ramie fibre both degummed and gummed



Harvesting of ramie crop

C) SUNNHEMP

1. Farmers sown sunnhemp crop during mid April (Crop age: 60-65 days)

- If drought condition persist and there is no likelihood of immediate rain one light irrigation may be provided.
- In areas where heavy rainfall occurs waterlogging may happens which may aggravate the wilt incidence, in such cases remove the excess water through surface drainage.
- Farmers are advised to be vigilant on the infestation of hair caterpillar, if substantial infestation observed, spraying of Chloropyriphos 20EC @ 2ml/litre any Neem based formulations @ 3-4ml /litre is recommended.



60-65 Days old crop



Crop affected by hairy caterpillar

2. Farmers sown the crop after 20 April (Crop age: 55-60 days)

- Farmers are advised to be vigilant on the infestation of hair caterpillar, if substantial infestation observed, spraying of Chloropyriphos 20EC @ 2ml/litre any Neem based formulations @ 3-4ml /litre is recommended.
- If drought condition persist and there is no likelihood of immediate rain one light irrigation may be provided
- There may be incidence of viral diseases like leaf curl and sunnhemp mosaic. Affected plant may be removed and destroy to prevent the further spread of the disease.



55-60 Days old crop



Crop affected by vascular wilt

3. Farmers sown sunnhemp crop in last week of April (Crop age: 45-55 days)

- The farmers are advised to be vigilant on leaf curl and phyllody infection. If infection observed, uprooting and burning of infected plants followed by spraying of Imidacloprid 17.8 SL @ 0.5-1ml/lit is recommended to minimise vector population.
- If dry condition persists flea beetle infestation may occurs which feeds on the leaves making small holes. Farmers are also advised to be vigilant on the infestation of hair caterpillar, if substantial infestation observed, spraying of Chloropyriphos 20EC @ 2ml/litre any Neem based formulations @ 3-4ml /litre is recommended
- Under extreme heat condition one irrigation is recommended.



45-55 days old crop



Spraying in flea beetle infested crop

4. Farmers sown the crop in first week of May (Crop age: 40-45 days)

- If no rainfall occurs or water stress is observed one light irrigation is advocated at 35 days after sowing. Maintain plant population (55-60 plant/square meter).
- If dry condition persists flea beetle infestation may occurs which feeds on the leaves making small holes. Farmers are also advised to be vigilant on the infestation of hair caterpillar, if substantial infestation observed, spraying of Chloropyriphos 20EC @ 2ml/litre any Neem based formulations @ 3-4ml /litre is recommended.



40-45 days old crop



Flea beetle infested crop

D) Mesta

1. Mesta crop not yet sown

- Prepare land for sowing 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) may be used. Before sowing seed should be treated with Carbendazim @2g kg⁻¹
- For broadcasting and line sowing, seed rate should be 15 kg and 12 kg ha⁻¹ respectively. Spacing should be 30 cm x 10 cm and depth of sowing is 2-3 cm. Laddering after sowing is essential for conservation of soil moisture and better germination of seed. Under rainfed condition sowing @12-14 kg seed/ha in open furrows developed by cultivators may be done to save from phasic drought. Fertilizer dose is N:P:K::60:30:30 with elemental sulphur @30 kg/ha (soil < 20kg sulphur/ha)
- 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. 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 insurance, strip cropping with black gram (4:4) or intercropping with maize or groundnut are advocated



Land preparation and sowing



Sowing in open furrow for in situ soil water conservation



Seed treatment with Carbendazim (1g per kg seed)

2. Sowing of mesta in last week of May (crop age 20 days)

- Quizalofop ethyl 5 EC can be sprayed @ 1.5 to 2.0 ml/l to control grass weeds at 15 to 20 DAS and follow one manual weeding.
- Remove other established weeds using scrapper of CRIJAF Nail Weeder or Single wheel jute weeder
- If heavy rainfall occurs, proper drainage is essential for proper growth and seedling disease management.



Weeding in mesta field

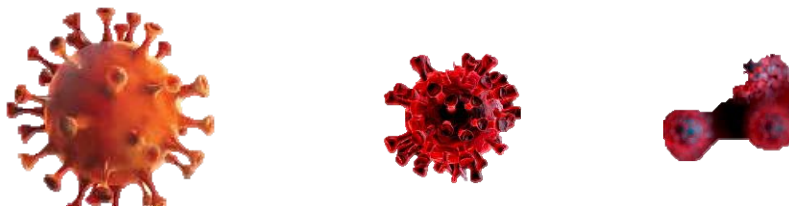
2. Sowing of mesta in first week of June (crop age 10 days)

- In broadcast mesta, CRIJAF Herbicide Applicator can be used for simultaneous weeding, thinning and line making using Glufosinate ammonium 13.5% (Sweep Power 6ml/Litre at 10-15 DAS).
- In line sown crop, spray Quizalofop Ethyl 5% EC or 10% EC @1.0ml or 0.7 ml/ litre at 10 days after sowing (DAS) followed by one manual weeding. For established weed control, use scrapper of CRIJAF Nail weeder at 10 DAS.



10 days old mesta crop

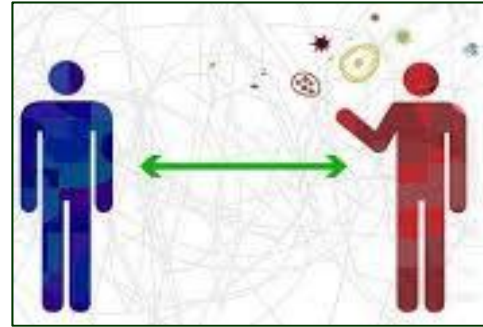
IV. Safety and Preventive Measures to be Taken to Prevent Spread of COVID-19 Virus



- 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) Prefer sowing operations by CRIJAF seed drill over the broadcasting wherever feasible. Also stagger the field operations wherever possible and avoid engaging more number of persons for sowing and land preparation on the same day.
- 3) Proper sanitation and cleanliness of machine like seed drill, nail weeder, irrigation pump, tilling equipment, tractor etc. are to be maintained especially when machines are shared and used by farmer groups.
- 4) Also maintain safe distance of 3-4 feet during rest, taking of meals, seed treatment at home, loading/unloading of manures and fertilisers.
- 5) 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.
- 6) 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.
- 7) 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 are to be relocated so that sufficient distances are maintained among the personnel 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, livers 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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