

AGRO-ADVISORY TO GROWERS OF JUTE AND ALLIED FIBRES

issued by

ICAR-CRIJAF, Barrackpore

14 – 23 September, 2020 (Issue No: 19/2020)



भाकृअप -केन्द्रीय पटसन एवं समवर्गीय रेशा अनुसंधान संस्थान
ICAR-Central Research Institute for Jute and Allied Fibers

An ISO 9001: 2015 Certified Institute

Barrackpore, Kolkata-700121, West Bengal

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**Agro-advisory to Farming Community of Jute and Allied Fibres
(14-23 September, 2020)**

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

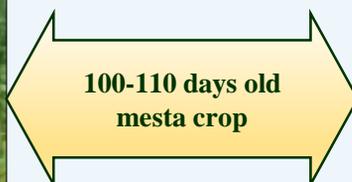
State/Agroclimatic Zone/Region	Weather Forecast
Gangetic West Bengal (Murshidabad, Nadia, Hoogly, Howrah, North 24-Prganas, Purba Burdwan, Paschim Burdwan, South 24-Parganas, Bankura, Birbhum)	Light to moderate rainfall/thunder shower is expected during 15-18 September, 2020 (total rain upto 40 mm). Maximum temperature (T_{max}) is expected to be around 33-34°C, and minimum temperature (T_{min}) of around 26-27°C.
Sub-Himalayan West Bengal (Cooch Behar, Alipurduwar, Jalpaiguri, North Dinajpur, South Dinajpur and Malda)	Moderate to heavy rainfall/thunder shower is expected during 15-18 September, 2020 (total rain upto 116 mm). Maximum temperature (T_{max}) is expected to be around 23-29°C, and minimum temperature (T_{min}) of around 20-24°C.
Assam: Central Brahmaputra Valley Zone (Marigaon, Nagaon)	Very light to moderate rainfall is expected during 15-18 September, 2020 (total rain upto 36 mm). Maximum temperature is expected to be around 27-31°C, minimum temperature of around 22-24°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 September, 2020 (total rain upto 100 mm). Maximum temperature is expected to be around 26-29°C, minimum temperature of around 22-24°C.
Bihar: Agro-climatic Zone II (Northern East) (Purnea, Katihar, Saharsa, Supaul, Madhepura, Khagaria, Araria, Kishanganj)	Light to moderate rainfall is expected during 15-18 September, 2020 (total rain upto 69 mm). Maximum temperature is expected to be around 27-30°C, minimum temperature of around 23-25°C.
Odisha: North Eastern Coastal Plain (Balasore, Bhadrak, Jajpur)	Very light to light is expected during 15-18 September, 2020 (total rain up to 20 mm). Maximum temperature is expected to be around 32-33°C, minimum temperature of around 25-26°C.
Odisha: North East and South Eastern Coastal Plains Region Kendrapara, Khurda, Jagatsinghpur, Puri, Nayagarh, parts of Cuttack, and parts of Ganjam	Very light to light rainfall is expected during 15-18 September, 2020 (total rain upto 10 mm). Maximum temperature is expected to be around 33-34°C, minimum temperature of around 26-27°C.

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

II) Agro-advisory for Mesta fibre crop

1. Mesta crop (100-110 days old)

- Waterlogging due to rainfall may occurs. In such condition improve drainage so that the crop remain free from biotic and abiotic stress. Very often foot and stem rot may aggravate due to water logging. If substantial incidence occurs then spray Copper oxychloride 50% @ 4-5g/litre towards the basal region of the plant.
- Some times due to wind the crop may lodge, in such cases tied the adjacent plants to keep it in upright condition and prevent crop loss.
- Phoma leaf blight is a common disease which affect the leaf from margin and progress inwards. Under humid condition the disease spread fast and defoliate the plant. If substantial infection (>5%) is noticed spray Copper Oxychloride 50% @ 4-5g/litre or Mancozeb @ 2g/litre.



2. Mesta crop (80-90 days old)

- Avoid waterlogging and improve drainage so that the crop remain free from biotic and abiotic stress. Very often foot and stem rot may aggravate due to water logging. Spray Copper oxychloride 50% @ 4-5g/litre towards the basal region of the plant.
- Some times due to wind the crop may lodge, in such cases tied the adjacent plants to keep it in upright condition and prevent crop loss.
- Phoma leaf blight is a common disease which affect the leaf from margin and progress inwards. Under humid condition the disease spread fast and defoliate the plant. If substantial infection (>5%) is noticed spray Copper Oxychloride 50% @ 4-5g/litre or Mancozeb @ 2g/litre.



Foot and stem rot



Phoma leaf blight of mesta



Mesta yellow vein mosaic(MYMV) affected field

3. Mesta crop (below 80 days old)

- In some mesta growing areas yellow vein mosaic may be noticed which is transmitted by white fly. Foliar application of Imidacloprid 17.8 SL @ 0.5-1ml/lit reduced the vector population which reduce the spread of yellow vein mosaic disease
- Avoid waterlogging and improve drainage so that the crop remain free from biotic and abiotic stress. Very often foot and stem rot may aggravate due to water logging. Spray Copper oxychloride 50% @ 4-5g/litre towards the basal region of the plant.
- Some times due to wind the crop may lodge, in such cases tied the adjacent plants to keep it in upright condition
- Phoma leaf blight is a common disease which affect the leaf from margin and progress inwards. Under humid condition the disease spread fast and defoliate the plant. If substantial infection (>5%) is noticed spray Copper oxychloride 50% @ 4-5g/litre or Mancozeb @ 2g/litre.



Foot and stem rot of mesta



Phoma leaf blight of mesta

Mesta yellow vein mosaic(MYMV) affected field



In-situ Retting Tank based Farming System Model

- ❖ 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 40 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-situ retting tank for jute and mesta based farming system developed at ICAR-CRIJAF Farm

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 losing 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.

III. Agro-Advisory for Allied Fibres

A) SISAL

Maintenance of Secondary Nursery

- Nursery should be made weed free and drainage facility should be made to avoid water stagnation. Spraying with Metalaxyl ,25%+Mancozeb 72% WP (0.25%) should be taken up as a preventive measure against disease for obtaining healthy sucker. Application of sisal compost will be helpful for supplying nutrient to the soil as well as for suppression of weed growth due to its herbicidal property. Out of 80,000 bulbils raised in one-hectare nursery, if properly maintained, farmers can get minimum 72,000-76,000 suckers. It is assumed that mortality of bulbils in secondary nursery is 5-10 percent. The top dressing with nitrogen fertilizer should be completed at the earliest for proper growth of the plantlets. The above practices are same for Hybrid sisal.

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.



Pit digging and planting of suckers in double-row system



Intercultural operation in secondary nursery



Maintenance of new sisal plantation



Spraying of fungicide against Zebra disease of sisal



Sisal sucker



Hybrid sisal plantation

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/hoe. 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.
- 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.
- 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 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 of plants. The planting of the suckers is to be completed within 45 days of collection. Atleast 100 suckers per hectare should be kept as reserved 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

Intercropping in sisal plantation for additional income

- In the interspace of double row sisal plantation, vegetables like chilly and ladies finger can be raised for additional income during the gestation period of sisal and maintenance of fruit plants like guava should be taken up.



Intercropping with 1. Ladies finger 2. chilli 3. guava

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

B) RAMIE



- As per forecast, medium to heavy/ thunder showers are very likely to occur, therefore, provision of draining out of excess rain water is very much essential as the.
- Harvesting of ramie crop is one of the most important operations, which is to be done after every 45-60 days. Timely harvest leads to good quality fibre and may fetch high market price.
- After each harvest weeding by jungle Jim followed by spraying of non-selective and non-residual herbicide like Paraquat or Glyphosate @ 0.13-0.25% is recommended.
- After harvesting application of 30:15:15 kg NPK/ha (around 65 kg urea, 94 kg SSP, 25 kg MOP is required) is recommended. Organic manures such as well rotten FYM and ramie compost may be used for better growth and productivity as well as simultaneously maintaining good soil health.
- Application of Quizalofop Ethyl 5% EC @ @ 1.0 ml/litre at 20 days after harvesting is recommended for entire ramie growing areas for significantly reducing all grassy weeds which are abundant during this period.
- Field should be well drained during heavy rains as the crop is very much sensitive to waterlogging condition.



Rramie plantation



Harvesting of ramie crop



Ramie fibre extraction



Weeding by Jungle Jim after harvest of ramie



Spraying of non-selective herbicide like Paraquat or Glyphosate



Ramie fibre after extraction (un-degummed)

Operations in Jute seed crop in West Bengal

- ❖ **Area of jute seed production in West Bengal:** Purulia, Bankura, Western part of Paschim Medinipur and Birbhum
- ❖ **Drainage of excess rain water:** Immediately remove stagnant water from the fields through proper drainage as jute seedlings can not withstand water-logging. If the growth of the crop become sickly, then after removing stagnant water apply nitrogen fertilizer @10-15 kg/ha to boost the growth.
- ❖ **Weed Management:**
 - a. If the crop is sown in first week of September in medium (*Baid*) land, remove the weeds in between lines with the help of CRIJAF Nail Weeder at 5-10 days of sowing.
 - b. Complete weeding and thinning at 21 days after sowing in early sown plots. If the jute seed crop is infested with broad spectrum weeds like *Cyperus rotundus*, *Fimbristylis miliacea*, *Cynodon dactylon*, *Brachiaria sp*, *Ageratum conyzoides*, *Celosia argentea* etc. then directed spray (mike nozzle guarded by plastic bottles, 10x10cm) of GLUFONISATE AMMONIUM (commercial product of Sweep power @7 ml/litre of water) at 25 days after sowing in between jute rows. Selective herbicide like Quizalofop Ethyl (Targa super) @1.5-2.0 ml/L of water at 15-20 days after sowing can control only grasses in jute seed crop.
 - c. Operate nail weeder wherever feasible to combat weed problem. Perform thinning and manual weeding at 21 DAS.

Management of diseases: If substantial incidence of leaf spot is noticed, foliar spray of Copper Oxycloiride 50% @ 5-7g/litre or Mancozeb @ 2-3g/litre may be done.



A=Herbicide like Quizalofop Ethyl @1.5-2.0 ml/litre applied field, B=Weeding with Nail Weeder and C= Thinning

- ❖ **Top dressing:** Top dressing of nitrogen (urea) after thinning and weeding @ 20 kg N/ha (43.5 urea /ha or 5.8 kg urea/*bigha*) in early sown crop at 21 days after sowing.
- ❖ **Detopping:** In uplands (*tarh* land) if sowing completed within second fortnight of August, then check for natural branching initiation. In absence of natural branching detopping should be done at 35-40 DAS.
- ❖ **Roughing:** Roughing should be initiated to eradicate off-type plants. Observe stem colour, leaf colour, leaf shape to identify off-type plants



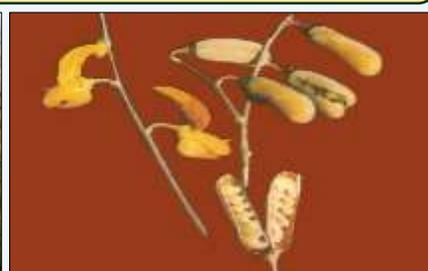
Jute seed crop

Operations in Sunnhemp Seed Crop

- In certain areas where winter is very mild, sowing may be done within 15 September with certified seed of improved varieties of sunnhemp such as Prankur (JRJ 610), Ankur (SUIN 037), Shailesh (SH-4), Swastik (SUIN 053), K-12 (Yellow) and Kavita (SUIN-3). If certified seeds are not available the fresh seed from authentic source or own seeds (one year old) may be used. Land should be well pulverised, basal dose of N: P₂O₅: K₂O @ 20:40-50:40 kg/ha (Urea: SSP: MOP @ 43.5: 312.5:66.7 kg/h) is recommended. Prior to sowing seed treatment with carbendazim @ 2g or *Trichoderma harzianum* @ 10g/ kg seed should be done
- Line-sowing with row to row spacing of 30 cm and plant to plant spacing of 10 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. After sowing, drainage channel should be prepared along the slope so that excess rain water can be drained out easily. In any cases there should not be any waterlogging.
- Those who have not done the weeding operation in mid-August sown crop, one weeding with wheel hoe or manual weeding may immediately so that weed competition can be reduced crop growth can be favoured. Maintain plant population by thinning (55-60 plant/sq meter).
- The farmers must be vigilant on the infestation of flea beetles which feeds on leaves by making holes on it. If substantial infestation observed, spraying of any Neem based formulations @ 3-4ml /litre is recommended. Also virus infected plant should be uprooted and destroy to prevent spread.
- Several viral diseases (mosaic, leaf curl) may be observed during early growth stage. It is advised to monitor the field and destroy the infected plant. Foliar application of Imidacloprid 17.8 SL @ 0.5-1ml/lit reduced the vector population which reduce the spread of viral disease



1. Seed treatment with Carbendazim 50 WP @ 2g/kg 2. Sowing of seed crop in lines (30 cm apart, plant to plant distance should be 10 cm) 3. Drainage channel and wheel hoeing after weeding at seedling stage 4. Thinning 5. Viral diseases 6. Flea beetle infested plant, apply Neem based formulations @ 3-4ml /litre



Sunnhemp seed 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) During harvesting of jute and preparation of *jak* in nearby water body, maintain proper distance and use face mask. Engage only familiar persons to the extent possible to prevent the entry of any suspect or likely carrier of COVID-19 virus.
- 3) 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.
- 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

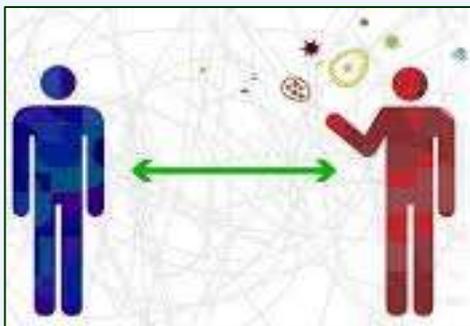


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V. Advisory for jute mill workers



- 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, 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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Acknowledgement: The Institute acknowledges the contribution of Chairman and Members of the Committee of Agro-advisory Services of ICAR-CRIJAF; Heads of Crop Production, Crop Improvement and Crop Protection division, In-charges of AINPNF and Extension section of ICAR-CRIJAF and other contributors of their division/section; In-charges of Regional Research Stations of ICAR-CRIJAF and their team; In-charge AKMU of ICAR-CRIJAF and his team for preparing this Agro-advisory (Issue No: 19/2020)