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Jute Production and Protection: An Overview

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SUMMARY

India is one of the world's leading jute-producing countries and its production relies on a humid climate with rainfall of 2500 mm spread over the vegetative development period of the chop. Excellent depths of alluvial soils are necessary for jute cultivation and silt from annually flooded areas is optimum for growth. Insect pests are one of the limitations in jute production, accounting for lowering the jute quality. The jute crop was damaged by diverse pests like jute semi-loper Anomis sabulifera, Guen which alone causes 90% damage to the leaves, whereas beet armyworm accounted yearly 20% yield loss of jute fibre, yellow mite (Polyphagotarsonemus latus Banks) and root-knot nematode (Meloidogyne incognita Chitwood) were recorded as the other major pests of jute. In this article, we will discuss the production and protection of jute in detail.

INTRODUCTION

Jute is an important natural fiber crop in India next to cotton, and it is extensively cultivated in eastern India almost throughout the country. India is ranked in 1st position in jute production and accounts for about 62.2 percent of world production. Jute is cultivated on 0.66 million hectares with an annual production of 1.98 MT, which is mainly produced in three major states in India- West Bengal, Assam, and Bihar. Jute is biodegradable and renewable, providing environmental benefits. It is also relatively affordable, making it an attractive crop choice. A total 77 number of composite jute mills are present in India. Out of which 60 are located in West Bengal. The Private sector holds 68 of them. State-wise jute production has been given in Table-1

Table1: State-wise average area, production and yield of Jute

State	Area ('000ha)	Production (bales)	Yield (tonnes)
West Bengal	576.10	8453.70	2781
Bihar	111.20	1637.10	2651
Assam	75.0	793.20	1904

Jute is a crop of humid tropical climates distributed in areas with rainfall of 2,500 mm spread over the vegetative growth period of the crop. Locations with a mean rainfall of <1,000 mm, rainfall and water logging are not suitable for its cultivation. For better growth, a mean maximum and minimum temperature of 34°C and 15°C and a mean relative humidity of 65% are required. *Corchorus olitorius* (Tossa jute) can't withstand water logging but *C. capsularis* (White jute) can withstand water logging. Clay loam and sandy loam are the most suitable soil types for raising jute.

Jute production: - Sowing time of jute may differ from area to area based on the receipt of pre-monsoon showers, availability of residual moisture and variety. Generally, sowing in the middle of March is optimum for all *Capsularis* varieties and the *Olitorius* varieties like JRO524, JRO878 and JRO7835 while JRO632 should be sown only after the middle of April. The depth of sowing is maintained at 2.5 to 3 cm and line sowing is preferable because It gives uniform spacing and easy access to Intercultural operations like weeding, hoeing, and application of pesticides and top dressing of fertilizer is easier, as well as gives higher yield. 10 kg/ha seed rate is required for optimum plant growth whereas 50 cm of water depth is required for growth and development, with 15% area in India irrigated. The crop calendar of jute is displayed in Table 2

Harvesting: - Jute can be harvested at any stage of its vegetative growth but mainly harvesting is done at small pod stage 135-140DAS. The harvested plants are left in the field for 2-3 days for the leaves to shed. Next, the plants are tied into bundles 20-25cm in diameter and the branching tops are lipped off to rot in the field.

Post-harvest processing: There are two processes involved in post-harvest processing namely retting and grading

Retting: - Retting is an important operation governing the quality of fibre. The bundles are kept in 30 cm deep water, and later placed side by side in retting water, usually in 23 layers are tied together. They are covered with water hyacinth or any other weed that does not release tannin and iron. The float is then weighed down with seasoned logs or with concrete blocks or is kept emerged (at least 10 cm below the surface of water) with bamboo- crates. Clods of earth used as a covering material or as weighing agent produce dark fiber of low value. Retting is best done in slow-moving large volume of clean water at around 34°C.

Grading: -Grading of fiber is done based on six parameters namely, strength, defect, root content, colour, fineness and density. As per BIS specification, there are eight grade classifications of jute, i.e., W1/TD1 to W8/TD8 (W indicates white jute and TD indicates Tossa jute).

Pest Profile of Jute: The jute crop is infested by many pests. The four major pests responsible for major yield reduction have been described below along with the occurrence and damage seasons. The pest profile has been given in Table 2 which explains that the major pest mealybug prevails from May to June and semi-looper causes damage during

Table: 2- Crop Calendar and Pest Profile of Jut

	Jan	Feb	Mar	Apr	May	Jun	Jul
Crop calendar			Sowing	Growth periods			Harvesting
Pest Profile					Mealybug		
				Semi-looper			
					Stem girdler		
					Stem weevil		

Mealy Bug (*Maconelicocus hirsutus*), (Pseudococcidae; Hemiptera): *Symptoms:* nymphs crawl out on the host and select a suitable spot to settle down; mostly settle on apical parts; leaf petiole shortened, lamina crumpled; plants appear with bushy-top; fibre quality deteriorated. *Biology:* eggs laid under ovisac; nymphs pinkish; secrete both a white mealy powder and honey-dew; female apterous. *Management: a) Non-chemical management:* conserve *Scymnus pallidicollis* (Coccinellidae) as an efficient predator- feeds vigorously on eggs, nymphs and adult females. *b) Chemical Management:* -Spraying parathion 0.05% or Monocrotophos at 1.3 litres per ha afford some protection.

Jute semilooper (*Anomis sabulifera*) (Nctudae; Lepidoptera): *Symptoms:* larvae voraciously feed on leaves and apical plant parts; apical buds are also damaged; normally damage ascends through a wave during July to August. *Biology:* eggs laid on tender plant parts and leaves; larvae greenish with stripes; pupates in soil; adult smoky coloured; several generations completed in a year**.** *Management:* plough infested fields after harvest to kill pupae; dislodge caterpillars into kerosenized water by drawing a rope across young crop; conserve larval parasitoids: *Litomastix gopimobani*, *Tricholyga sorbillans* and *Sisyropa formosa*

Jute Stem Girdler: (*Nupserha bicolor postbrunneae),* (Lamiidae; Coleoptera): *Symptoms:* female beetle makes two rings by cutting a strip on the stem for oviposition; withering, drooping and death of plant; loss of fibre yield and quality; not much damage is caused by feeding of Larvae. *Biology:* eggs laid near pith region where female girdles stem; larvae stout whitish; pupates in a chamber made in hollow of a stem; adult large and strong beetle; serious on *C. olitorius. Management:* a) *Non-chemical management:* grow resistant jute *C. capsularis*; clean cultivation; larval parasitoids: *Neocatolaccus nupserhae* and *Norbanus acuminatus b) Chemical Management:* Spray application of Phosalone 0.07%or Quinalphos 0.05% at fortnightly interval is effective.

Stem Weevil: (*Apion corchor),* (Apionidae; Coleoptera)- *Symptoms:* grubs' tunnel to pith; gall like swelling on stem; fiber quality deteriorated as stem is punctured at many positions by females. *Biology:* eggs laid in small hole on stem made by females; pupates inside stem; adult small black beetle; serious on *C. capsularis Management:* a) *Non-chemical management:* judicious N fertilizer use; late planting of crop; removal and destruction of infested plants. *b) Chemical Management:* Spray application of Phosalone 0.07%or Quinalphos 0.05% at fortnightly interval is effective.

1.Mealy Bug & damage

2. Stem Weevil

3. Jute Stem Girdler

4. Stem Weevil & damage

CONCLUSION:

Jute is a renewable source of bio-mass and the products are bio-degradable, reusable, easily-disposable. After green revolution due to the use of vigorous fertilizer, pesticides and intensive crop pests broke out around the country & and damaged our crops. Though we are using chemical insecticides to control the pest continuous use of those pesticides makes the pest more resistant to these. Also, pesticides attack other animals and cause health hazards & and habitat degradation. So, it is time to think about this serious problem & have to reduce the use of that chemical. Therefore, biological pest control programs were introduced into IPM. The parasitoids are unlikely to be specific to *Anomis* sp but also attack other lepidopteran larval feeds on the same plants. Most of the other insect hosts are themselves larval feeds on the same plants, whose abundance is also desirable to lower. Therefore, through these modern IPM practices, we can lead to the eco-friendly opportunity for a sustainable future of jute.

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