

Yellow mite of jute

Problem and its management

S Satpathy^{1*} and V Ramesh Babu¹

¹ICAR-Central Research Institute for Jute and Allied Fibres, Barrackpore, West Bengal 700 120

The pest status of yellow mite has gradually enhanced in jute which is mainly due to excessive reliance of chemical pesticides and favourable weather condition for mite during the early growth phase of the crop. Comprehensive adoption of proper management strategy for jute mite is very important to reduce the cost of protection and increasing the fibre yield and quality. The integrated pest management (IPM) strategy involving proper sowing time, tolerant variety, line sowing, balanced nutrition, need based use of entomopathogens and new safer acaricides is important for sustainable management of yellow mite in jute.

Keywords: Integrated pest management, Jute, Yellow mite

JUTE and allied fibre crops are versatile natural bast fibre yielding crops with considerable commercial, environmental and socio-economic importance. Jute is predominantly grown as a rain-fed annual crop in the Eastern and North-Eastern states of India. The jute productivity in India has increased by two folds during the last 50 years. Still few constraints adversely affect the quality and potential yield of jute fibre. There are several species of pests belonging to insects, mites and nematodes which infest jute at different growth stages among which mite is predominant and regularly infests the crop.

Yellow mite problem in jute

In jute, the infestation of yellow mite, *Polyphagotarsonemus latus* is more regular and severe. Because of the polyphagous nature of yellow mite, the changing cropping sequence, presence of favourable alternate hosts during and prior to the cropping season usually enhance the abundance in time and space. Yellow mite is becoming an increasingly important pest of jute. It is a very common and destructive pest of jute. Both yield and quality

of fibre are reduced due to the attack of this pest.

Biology and life cycle

The newly hatched adults of both the sexes are white in colour and gradually turn to yellow after 24 hours. Females are larger than males and their average life span is about one week. The average life span of males is 6 days. After hatching, they suck the sap from the ventral surface of leaf. The females rest for some time after mating and lay eggs preferably on the young leaf which are like buds. The female lays eggs singly on the ventral surface of leaves between vein lets. Approximately, 23 eggs are laid throughout the life period. The egg stage lasts for 30 hours. Active nymph of yellow mite



Nymph and eggs of jute mite



Eggs of jute mite

is crystal white in colour and three pairs of legs mark the nymphal stage, the fourth pair of leg develops during adult stage. The average nymphal period in case of female is 24 hours, whereas in case of male, it is 18 hours.

Nature of damage

Both nymphs and adults suck the sap from ventral surface of young leaves, which curls ventrally in due course of time. Infestation of yellow mite is restricted up to 7th leaf from top. The leaf lamina does not grow to their full size and petiole is elongated; soon they turn coppery-brown and drop prematurely. The vertical vegetative growth of the crop is arrested, internodes become shortened and significant yield loss occurs regularly. *Tossa* jute suffers



Damage symptom of mite in jute plant



Mite affected jute crop

more due to yellow mite infestation than the *white* jute. The yield loss may be 10-42% depending on 20-90% plant infestation. Mite damage can reduce the strength of the jute fibre by 20-30%.

Seasonal abundance and pre-disposing factors

Yellow mite activity on different hosts persists throughout the year. In early growth stage, jute suffers with heavy infestation of mite attack. Maximum mite population is observed from March to May. Prevalence of prolonged lower maximum temperature (30-32°C) and minimum temperature (20°C) coupled with cloudiness, high humidity (74%) and absence of rainfall favours mite population build up. The period during the 25th and 26th standard meteorological weeks are conducive for faster multiplication of yellow mite.

Management strategy

Integrated approach including cultural manipulation of the crop and its environment; resistant

varieties, biological control using predators, parasite, microbial pesticides, plant products and chemical control provide sustainable management of yellow mite in jute.

Host plant resistance

The potential role of host plant resistance (HPR) in the context of integrated pest management has been well recognized. It acts as preventive measure against buildup of pest population and is free from environmental pollution. *Tossa* and white jute varieties JRO 7835 and JRC 212 respectively are moderately resistant to mite. Among other *tossa* jute varieties, JRO 524, JRO 204 and JROG 1 are more tolerant compared to other newly released varieties. In mite endemic areas, these varieties should be selected for sowing to reduce the mite infestation.

Cultural control

Precise manipulation of cultural practices such as early or delayed sowing, cropping pattern, spacing, irrigation and fertilizer application can minimize the severity of mite damage on jute. Infestation can be avoided to some extent by sowing the jute crop in second week of April. Earlier sown jute crop faces higher incidence of yellow

mite. Line sowing reduces mite infestation as it delays or did not allow to develop suitable micro-climate for proper multiplication of mite. Drought condition increases severity of damage caused by mite. Hence, it is very important to maintain soil moisture by irrigation so that the stress due to mite feeding is not aggravated. Balanced plant nutrition helps to reduce mite damage, particularly soil application of sulphur @ 30-45 kg per ha during sowing subsides mite infestation and damage.

Biological control

The role of biological control of mite pests in agriculture is less compared to other arthropod pests. Among the natural enemies, few phytoseiid predators have shown promise against tarsonemid mite but their successful utilization in field level is lacking. Biological control of mite pests has been made by augmenting these phytoseiid mite predators. It is very important to use selective insecticides which are safer to such predators.

Botanicals and biopesticides

Numerous botanicals and biopesticides are commercially available. Various neem formulations have been found to be effective against yellow mite of jute. Addition of mineral oil with this botanical enhances its efficacy against jute mite because of the synergistic effect of agriculture-grade mineral oil. Foliar spray of combination of mineral oil @ 3 ml/



Line sowing of jute with CRIJAF-jute seeder



Mite-tolerant jute variety- JRO 204

lit + neem oil @ 3 ml/lit at 35 and 50 days after sowing (DAS) is effective in reducing jute mite infestation. The entomopathogenic fungal formulations have been effective in

causing mortality to yellow mite. On the basis of infectivity of talc based formulation of entomopathogens i.e., *Isaria fumosorosea* (= *Paecilomyces fumosoroseus*) and *Beauveria bassiana* showed promise against yellow mite @ 6×10^8 colony-forming units (CFU)/l concentrations.

Chemical control

Till date many acaricides, insecticides or their combinations have been labelled for yellow mite management. Few of them are very much effective against yellow mite of jute. Chemical control measures with the foliar spray of spiromesifen 240 SC (120 g a.i./ha) or fenazaquin 10 EC (100 g a.i./ha) or fenpyroximate 5 EC (50 g a.i./ha) and propargite 57 EC (700 g a.i./ha) are quite effective in

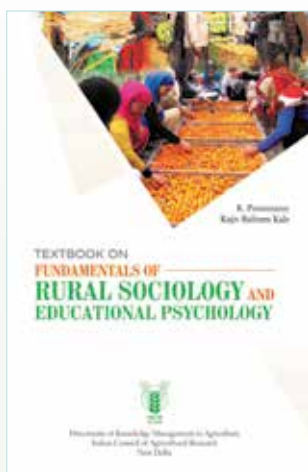
reducing the yellow mite population in jute. The spray should be initiated on the basis of economic threshold level (ETL) of 42 mites per second unfolded leaf of the plant.

Integrated approach

Chemical control of yellow mite is gradually becoming less effective. Hence, it is imperative that we follow integrated approach. This integration will involve agronomic and cultural management; host plant resistance, biological control, natural pesticides and selective and judicious use of chemical pesticides. At the same time, we should explore the possibilities of maximizing the efficacy of pesticide while minimizing its impact on natural enemies.

*Corresponding author e-mail:
satp1@rediffmail.com

Textbook on Fundamentals of Rural Sociology and Educational Psychology



India being a land of villages, rural sociology and educational psychology is an essential theme for agricultural students and professionals. Rural sociology deals with rural society and the relations of people who live in villages. Rural sociology presents a scientific picture of rural life.

Extension workers work with farmers very closely in their settings for which their understanding of rural background and farmers' psychology is very essential. Extension professionals should have necessary knowledge of the precise approaches and methods of dealing with farmers. Rural sociology can help professionals in organizing the rural structure in a constructive manner.

This textbook consists of fundamental facts of rural sociology. The book has twenty two chapters covering both rural sociology and educational psychology out of which twelve chapters consist of rural sociology and ten chapters deal with educational psychology. In this text book, emphasis has been given on various aspects of educational psychology also. It provides all the relevant information in the field of rural sociology with special emphasis on Indian culture, merits and demerits of Indian rural societies, the stressful conditions under which farmers live and work. The book will be a good basis of information reference for agriculture students, psychology students besides extension practitioners, research scientists, KVKs and agricultural colleges.

TECHNICAL SPECIFICATIONS

No. of pages : i-viii + 252 • Price : ₹ 450 • ISBN No. : 978-81-7164-181-9

For obtaining copies, please contact:

Business Unit

Directorate of Knowledge Management in Agriculture
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012
Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@gmail.com