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Sucking insect pest complex on som plant and its management

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Abstract

Som (*Persea bombycina*) is a cross pollinated plant and is a primary host food plant for muga silkworm *Antheraea assamensis* Helfer. These plants can be propagated by both two ways (Sexual and Asexual method) but mostly it is propagated through seeds only which were collected from selected healthy plants in order to ensure production of good healthy seedlings. Hence, It is utmost care required for one success in the field of muga sector as systematic plantation of host plants free from disease and pest attack are required for production and productivity of raw silk. The above plants are very prone to attack of various disease and pest complex results in deterioration of quality and quantity of leaves, ultimately it will affect the production of cocoon quality at large. In view of the above, this paper mainly focus on some sucking insect pest complex and how to management them.

Keywords: Som, muga silkworm, aphids, jassids, thrips and its management

Introduction

Muga sericulture is mainly practiced by marginal or poor growers using forest and forest fringe lands (Jolly *et al.*, 1981) ^[1] and contributes significantly to the livelihoods of tribal peoples (Singh *et al.*, 2012) ^[9]. It is a sericigenous insects that secreting a golden yellow coloured lustrous silk due to which, this silk is called as muga silk. Due to presence of unusual colour and strong nature of the thread produced from the cocoon are unique in feature. It is multivoltine in nature, semi domesticated one with five to six crops per year (Singh *et al.* 2013) ^[10]. Since the som plant is used as primary host plant for growth and development of silkworm and production high quality of mug raw silk, it is very mandatory for safeguard these pants from the attack of sucking insect pest complex (Singh *et al.* 2013) ^[10].

Aphid or Plant louse

It belong to family Aphididae (Singh *et al.* 2013) ^[10] comes under the order of Hemiptera which is categorized under a group of sap-sucking insect. It is soft-bodied insects with long leg and antenna which vary in shape and colour whose body shape may be globular, oval, or elongated and while in regard to colour, they may emerge as black, gray, red, orange, yellow, green, or wax-covered (Singh and Thangavelu 1994) ^[4]. Adult aphids may be formed in two ways namely winged alate form or wingless apterous form. On the fifth abdominal segment, a pair of tube-like structures projection called 'siphunculi' or 'cornicles' are present which secrete a plentiful defensive fluid substances called honey dew.

Habitat and food sources

They are gather together usually in colonies on the undersides of leaves, twigs, stem or shoot and fruits of the plants. They are having piercing and sucking type of mouth parts by use of which they suck the sap from the plant parts. Both nymphs and adult do suck the sap and cause damage vast to diverse parts of the plant

Lifecycle

It is having many generation in a year with a simple metamorphosis and parthenogenic type of reproduction (the production of offspring occurs without involvement of mating). These aphids may even bear live young, instead of laying eggs whose average lifespan of an adult is approximately one month while under good environmental conditions, its reproductive period may be three weeks. It can reproduce faster and quickly therefore its multiplication rate is more than any other insect.

Nature of injury

- 1) It can cause stress to plant by directly sucking sap from phloem tissues
- 2) As insect secrete a copious sugary secretion called honey dew on the plant parts followed by formation of black coloured sooty mould fungus growth result in plummeting the aesthetic quality of infested plants by discoloring the foliage (Singh and Thangavelu 1994)^[4].
- 3) It further will affect photosynthesis activities of the plants
- 4) They will inject plentiful toxic substances in to the plants as a result of which leaf curling, yellowing and deformation of further growth may occur.
- 5) It act as vector for transmission of some plant diseases, especially viruses from one plant to another plant
- 6) It is having capacity to cause damage to the plants even when less number of population are there.

Control measure

- Application of a small quantity of fertilizer as per recommendation rate throughout the growing season
- Thorough wash the leaves of affected plants with enough water can be initiated for which A water hose and nozzle with adequate pressure can be used to knock population from the foliage without damaging the plants
- It can also be rubbed off the plants with fingers or a wet cloth but this method is ineffective when large number of population are there.
- Biological natural enemies lady bird beetle can be encouraged to keep on checking and these beetles should be conserved by reducing application of broad spectrum insecticides.
- Green lacewing larvae (*Chrysoperla rufilabris*) whose larvae are extremely violent and will eat plentiful population a day.
- Another natural enemies parasitic wasps *Aphidius* species can be released
- Entomopathogenic fungus *Beauveria bassiana* can be applied but in case of sericulture sector where, it is not advisable as it form fungus growth on silkworm
- Insecticides can be applied but it is not recommendable in sericulture as it creates residual effect on the plants.

Thrips or lacerating insect

It is belong to the family of thripidae and order of Thysanoptera (Singh *et al.* 2013)^[10]. It is major pest on som plant. They are hemimetabolous insects with egg, larvae, prepupal (quasi pupal stage), and adult stages. The adults and larvae are the two mobile stages. The two common wing morphs include the brachypterous (short-winged) and macropterous (long-winged) forms are present.

They are minute and small insect with fringed wings. The sclerotic cuticle and integument shows feature sculptured patterns. The head is hypognathous type where sutures are absent in the head capsule. They are having compound eyes which consists of number individual sensory units called ommatidia. In winged species, three ocelli are present. The mouth parts is rasping and sucking type or lacerating or asymmetrical type mouthparts where right mandible are absent (Sarmah *et al.* 2005)^[7]. The female is larger than males. They act as a vectors for some disease fungal, viral, and bacterial diseases of plants. They are haplodiploidy sex determination wherein the fertilized eggs produce diploid females, and the non-fertilized eggs result in haploid males (Moritz *et al.* 2009)^[2]. In general, two types of thrips are

causing damage to som plants which includes *Liothrips litseae* Moulton and *Thrips tabaci* (Singh and Saratchandra 2011)^[8]

Nature of damage

Both nymphs and adult suck the sap from the leaves and causing silvery appearance on the leaves due to feeds on epidermal content of the leaves. It will affect both in seedling stage and as well as grown up plants. In case severe infestation, the infected whole plant shows drying, yellowing, scarring, curling of leaves, necrosis and leaf tissue may appear sunken, black fecal deposit may be observed on the leaves, stunted growth of plants and ultimately death of the plants occur.

Life cycle

This insects are more active throughout the year. The males are wingless one where as the Females have elongated wings with lot of fringed hair and lay 50 number of eggs. It has good reproductive capacity, short lifecycles, broad host range, and thigmotactic behavior. The life cycle of females is 30 days or less whose colour is in yellowish brown. Nymphs are yellowish-brown in colour which is smaller in size (Singh and Saratchandra 2011)^[8]. Generally, the nymphs are favor to feed on the lower surface of the leaves. As soon as attaining full grown stages, they will go to the soil where pupation takes place at a depth of around 20 mm (Singh *et al.* 2004)^[6].

Management

- Avoid to grow susceptible plants near to these crops
- Remove the weeds nearby vicinity area as much as possible as it is serving harbor and act as an alternate host for residing the population
- Periodically appropriate cultural practice to be adopted so that plants will get vigorous and healthy one.
- Periodically pruning of the plants and removal of infested leaves and other parts can be followed.
- Regularly irrigation should be given to the plants as frequent as possible
- Using of excessive nitrogenous fertilizer should be avoided as it promote build up of population
- In order to trap the adult population, yellow sticky traps can be effectively installed just above the canopy plants in the field
- Water containing pan yellow trap can be effectively used for trapping population (Singh *et al.* 2013)^[10].
- Predatory thrips, green lace wing, mite and some parasitic wasps will help in controlling the population thus, naturally available natural enemies can conserve and encourage them to avail periodically
- In muga plantation, spraying of insecticide is not advisable as it create residual effect on the plant thereby kill silkworm population but spraying of 1 ml Methyl parathion 50 EC in 1 liter of water can be recommended but waiting period must be given at least 7 to 10 days before the feeding of the silkworm larvae (Singh *et al.* 2000)^[5].

Green leaf hopper (Jassid)

It is other the major sucking pests of plants which belongs to the family Cicadellidae and order Hemiptera (Sarmah *et al.* 2005)^[7]. Normally, two types of Green leaf hopper will affect som plant which are *Ambrosia bagatelle* Ishida and *Empoasca binotata* Pruthi. This insect is most common in som plant

ecosystem. They are bright green coloured insect with different black marking shows on the body. It is having habit of diagonal movement. A black spot can be observed in case of male insect that is absent in female insect. They will lay Greenish transparent eggs in to the midrib of leaf blade or sheath of the host plant leaves or green grass. The nymphs are soft bodied, yellow white in colour and gradually colour changes to green as grow whereas. They are bright green coloured insect with different black marking shows on the body. It is having habit of diagonal movement. A black spot can be observed in case of male insect that is absent in female insect (Sarmah *et al.* 2005)^[7].

Nature of damage

Both Nymphs and adults suck the sap from ventral surface of leaves and inject toxic saliva into plant tissue as a result of which the infected leaves become yellowing from tip to downward, drying up of the plant and finally retard vigorous growth and stunted plant.

It act as a vector for many transmit many disease. (Sarmah *et al.* 2005)^[7].

Management

- Encourage field sanitation in the field regularly
- Nursery should not be raised near to lamps
- In muga plantation, spraying of insecticide is not advisable as it create residual effect on the plant thereby kill silkworm population. If required, Spraying of 2 ml Dimethoate in 1 liters of water per acre should be followed (Sankar *et al.* 2007)^[3] and Carbaryl (0.1%), toxaphene, endrin, can also applied to manage the pest infestation (Singh *et al.*, 2000)^[5]. but waiting period must be given at least 7 to 10 days before the feeding of the silkworm larvae (Singh *et al.* 2000)^[5].

Conclusion

Muga silkworm, *Antheraea assamensis* Helfer is an aboriginal species to North Eastern province of India. Appropriate Weather ecological circumstances, strong seeds and vigorous host plants are the major factors for completion of successful of muga silkworm. Among the various factors, the healthy host plants are very important one for growth and development of the silkworm. Recent findings revealed that various insect pests that cause heavy infestation to the host plants of sucking group of insects such as aphids, thrips and jassids are very perilous.

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