

Tobacco Leaf Caterpillars in Tobacco Crop Cultivation

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SUMMARY

Tobacco caterpillars (*Spodoptera litura*) cause damage to both cultivated crops as well as non-cultivated crops. Mainly it affects solanaceous crops imposing serious threats to its cultivation. Integrated Pest Management (IPM) strategy is suggested as the best option for the management of this pest.

INTRODUCTION

Tobacco (*Nicotiana tabacum* L) is an herbaceous annual or perennial plant in the Solanaceae family farmed for its leaves. It has broad, oval-shaped leaves and a strong, hairy stalk. The tobacco plant produces huge clusters of tubular-looking flowers that range in colour from white to cream to pink to red and can measure between 3.5 and 5.5 centimetres in length. Tobacco is often planted as an annual crop and has a height range of 1.2-1.8 m (4-6 feet). Tobacco cultivation sometimes goes by the name cultivated place such as South American tobacco, or Virginia tobacco. India is among the exporters of tobacco in the world.

Spodoptera litura, otherwise known as the tobacco cutworm or tobacco leaf caterpillar, is a nocturnal moth in the family Noctuidae. *S. litura* is a serious polyphagous pest in Asia, Oceania, and the Indian subcontinent that was first described by Johan Christian Fabricius in 1775. In total, 87 species of host plants that are infested by *S. litura* are of economic importance. Their potential impact on the many economically important crops has led to serious efforts to control the pests. The lower and upper limits of habitable temperatures are 10 and 37 °C (50 and 99 °F), respectively. Therefore, it is well suited for tropical and temperate climate regions.

Life cycle: Although the length of a life cycle varies slightly throughout the different regions. A typical *S. litura* will complete 12 generations every year. Each generation lasts about a month, but temperature causes slight variations.

Egg: Eggs are spherical and slightly flattened. Each egg is around 0.6 mm in diameter with an orange-brown or pink colour. These eggs are laid on the surface of leaves in big batches, with each cluster usually containing several hundred eggs. Females have a typical fecundity of 2000 to 2600 eggs. However, experiments have shown that high temperatures and low humidity are inversely related to fecundity.

Larva: Younger larvae tend to be a lighter green while older ones develop to a dark green or brown color. A bright yellow stripe along the dorsal surface is a characteristic feature of the larvae. Newly hatched larvae can be found by looking for scratch marks on leaf surfaces. Since *S. litura* is nocturnal, the larvae feed at night. During the day, they can usually be found in the soil around the plant. There are six instar stages, and by the last stage, the final instar can weigh up to 800 mg. Pupa: Pupa lasts around 7 to 10 days and takes place on the soil near the base of the plant. Adult: The hindwings are grayish-white with a gray outline. The mean female longevity is 8.3 days while for males it is 10.4 days (Patil, R., Meheta, D., Jat, B., & Gheyta, L. 2014).

Integrated pest management: Integrated pest management focuses on all possible management strategies to keep the pest below the economic threshold level. IPM not only reduces pesticide consumption in agricultural fields but also reduces pest problems caused by pesticides (Natkier & Balikai, 2015). In this integrated pest management strategy, all possible management strategies are discussed thoroughly

Summer ploughing: By exposing the soil to the sweltering summer sun, deep ploughing in the summer can control *Spodoptera* egg masses, root-knot nematodes, fungi, and weeds. It manages orabanche as well.

Field sanitation: The stubbles need to be collected and burned once the leaves have been harvested. Pests and pathogens can be controlled by plough after harvest.

Growing of resistance varieties: High yields can be obtained by growing T.M.V and Blackshank resistant varieties including CTRL special (MR), Jayasree (MR), V.T.1158, Hema (M.R), and 16/103 (M.R), as well as Blackshank resistant types like MC nair - 12 and Cm-12.

Planning time: Tobacco crops can be protected from pests and illnesses by planting on schedule date.

Planting distance: Maintaining the ideal distance between the plants is important. Close seedling planting increases the risk of pests and diseases. By providing favourable sunlight, air, and natural enemies, planting at the right distance can reduce pests and diseases.

Water management: In nurseries, timely irrigation can prevent pest infestation.

Light trap: By setting up light traps in the field, one may determine the kind and extent of the prevalence of pests and take the necessary steps to safeguard plants.

Pheromone traps: Tobacco caterpillars can be controlled by placing 5 Pheromone traps (each containing 2.5 mg of liture pheromone) per acre.

Coloured trap: The installation of castor oil-coated yellow galvanised iron sheet traps @5 per acre can stop the spread of adult.

Bird patches: By placing three to four Bird Patches in the field, you can encourage birds to devour the larvae.

Natural Enemies: Parasitoids: *Trichogramma chilonis* (egg), *Telenomus spp.* (egg), *Campoletis chloridae* (larval), *Peribeia orbata* (larval), *Glipapanteles africanus* (larval), *Cotesia ruficrus* (larval), *Chelonus carbonator* (larval), *Blepharoplasty setigera* (pupal), *Sarcophaga dux* (pupal), *Sarcophaga albiceps* (pupal), *Brachimoria lasus* (pupal), *Lasiochalcidia erythropoda* (pupal).

Predators: *Chrysoperla zastrowi sillemi*, *C. crassinervis*, king crow, braconid wasp, dragon fly, spider, praying mantis, *Harpactor costalis*, *Rhynocoris fuscipes*, *R. squalis*, *Polistes stigma*, *Coranus spiniscutis*, *Andrellus spinidens* have been found effective in management of castor.

Attractant / Repellent: Castor can be grown as a trap crop along the field border to attract the egg-laying female adult moths. Carrot family, sunflower family, buckwheat, alfalfa, corn, shrubs (minute pirate bug and lacewing).

CONCLUSION

Spodoptera litura is a highly destructive pest which feeds on leaves causing a great decline in crop production. Caterpillars are voracious and polyphagous in nature and can damage more than 112 cultivated and weed species. Temperatures below 15 °C and above 35 °C are deleterious for the growth and development of insects. Integrated pest management is an alternative approach to pest management. Field sanitation, trap cropping strategy and use of botanicals along with the use of pheromones are the common IPM strategies. It's very much used to manage the tobacco caterpillar, at the farmer level easy to adapt and cost-effective, and free of pollution to the environment as well.

REFERENCES

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