

Insect Pests of Brinjal and Their Management

Meenakshi Devi*

Department of Entomology SGT University, Gurugram (Haryana)-122505

ARTICLE ID: 069

Introduction

Brinjal (*Solanum melongena* L.), originated from India and it is also known as “eggplant” or “King of vegetables”. Eggplant is grown as a vegetable throughout the tropical, sub-tropical, and warm temperate areas of the world. It provides nutrients such as dietary fiber, ascorbic acid, vitamin K, niacin, vitamin B6, pantothenic acid, potassium, iron, magnesium, manganese, phosphorus, and copper to poor people's diets, which is particularly important when other vegetables are scarce. The crop is attacked by a number of insect pests including shoot and fruit borer, whitefly, leafhopper, aphid, Hadda beetle, Stem borer, Lacewing bug, Brinjal brown leafhopper, and Leaf roller. Besides these insects brinjal is also attacked by mites, which results in significant losses in the yield. This article mainly focused on the identification, life cycle, nature of the damage, and sustainable management of major insect pests of brinjal.

Major Insect Pests of Brinjal

- 1. Fruit and shoot borer, *Leucinodes rbonalis* (Lepidoptera: Pyralidae):** In South and Southeast Asia, the fruit and shoot borer is one of the most dangerous pests of brinjal. It can be found in Asia's tropics, where it can reduce yield by up to 70%.

Nature of Damage: The newly hatched larva begins to bore near the growing stage, flower buds, or fruits. It feeds on tender shoots during the early vegetative phase of crop development. The larva fills the entry hole with excreta shortly after drilling into the fruits. The larva tunnels within the shoot, feeds on the inner material, and then excretes into the feeding tunnels. This resulted in the withering of the plant.

Life cycle: Adult females lay about 200 creamy white eggs on the undersides of leaf tender shoots, flower buds, or the base of developing fruits, either singly or in groups of two to five. Until hatching, these eggs turn red, and the egg cycle is three to five days. The larvae are creamy white to pink in color in their early stages, and mature

larvae have a dark brown or blackish head. The larva usually has five instars, sometimes six and the larval period is about two weeks in summer and three weeks in winter. The larva pupates on the plant parts or plant debris on the soil surface. The pupa has tough silken cocoons and is dark brown in colour. On the dorsum of the thorax and abdomen, the moth is white or pale brown with black spots. The female is bigger than male, with a bulged abdomen. The female moth tends to curl its abdomen upwards. The adult life span is about a week; the females live longer than males. In a year there are five overlapping generations.

Management: Remove the affected terminal shoot and fruits showing boreholes. Avoid continuous cropping of brinjal crop. Grow the varieties with long and narrow fruits in endemic areas. Install pheromone trap@12/ha. Encourage the activity of larval parasitoids: *Pristomerus testaceus*, *Cremastus flavoorbitalis*. Avoid use of synthetic pyrethroids and Avoid using insecticides at the time of fruit maturation and harvest. Spray any one of the following chemicals starting from one month after planting at 15 days interval.

Insecticide	Dose
Azadirachtin 1.0% EC (10000 ppm)	3.0 ml/lit.
Chlorpyrifos 20 % EC	1.0 ml/lit.
Dimethoate 30 % EC	7.0 ml/10 lit.
Emamectin benzoate 5 % SG	4 g/10 lit.
Flubendiamide 20 WDG	7.5 g/10 lit.
Phosalone 35 % EC	1.5 ml/lit.
Quinalphos 25 % EC	1.5 ml/lit.

2. **Whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae):** The whitefly is highly polyphagous and is known to feed on several vegetables including tomato, eggplant, okra, field crops and weeds. Hot and dry conditions favor the whitefly. This insect is active during the day and settles on lower leaf surfaces at night.

Nature of Damage: Nymphs and adults suck the plant sap and secrete honeydew, which favors the growth of sooty mould on leaf surface and reduce the photosynthetic efficiency of the plants. In case of severe infestations, the leaves turn

yellow and drop down.

Life cycle: The females lay about 300 eggs in its lifetime on the underside of leaves. Egg period is about three to five days during summer and 5 to 33 days in winter. After hatching nymphs moves on leaf surface to find a suitable feeding site. The nymphs are flattened, oval-shaped, and greenish-yellow in color. Nymphal period is about 9 to 14 days during summer and 17 to 73 days in winter. Adults emerge from pupation through a T-shaped slit, leaving behind empty pupal cases or exuviae. The whitefly adult is a soft-bodied, moth-like fly covered with powdery wax and the body is light yellow in color. The wings are held over the body like a tent. The adults live for one to three weeks.

Management: The field selected for brinjal or seedling production should be clean and not be located near any host plants and weeds. Grow eggplant seedlings in insect-proof (50–64 mesh) net houses, net tunnels, greenhouses, or plastic houses. Use yellow sticky traps at the rate of 1-2 traps/50-100 m² to trap the whitefly. Plant fast-growing crops like maize, sorghum, or pearl millet in the border of the field to act as barriers to reduce whitefly infestations. Use malathion 50% EC @ 400g/acre or Acetamiprid 20% SP 100 g/ha or Chlorpyrifos 20% EC 1250 ml/ha in 200-250L of water at 15 day intervals. Neem seed kernel extract 5% (50 kg) and neem oil at 5 ml/l of water.

- 3. Leafhopper, *Amrasca devastans* (Hemiptera: Cicadellidae):** Relatively dry and humid weather favors population build-up.

Nature of Damage: Both nymphs and adults suck the cell sap from the lower leaf surface. “hopper burn”.

Life cycle: Adult females lay eggs along the midrib and lateral veins of the leaves. The nymphs resemble the adults except wings. They are pale green in color. They tend to move sideways when disturbed. The adults are wedge-shaped, pale green insects with fully developed wings and a prominent black spot on each fore wing. The adults may live for one to two months.

Management: Use yellow sticky traps. Grow okra as a trap crop along the borders of a brinjal field. Spray Neem seed kernel extract (NSKE) @ 5%. Before fruit formation use malathion 50EC @ 300-400ml/acre in 200-250L of water, after

initiation of fruit use fenvalrate 20EC @ 80ml or cypermethrin 25EC @ 70ml or deltamethrin 2.8EC 200ml or carbaryl 50WP @ 500g in 200L water per acre. Use synthetic pyrethroids at 21 day intervals and other insecticides used at 15 day intervals.

4. Brinjal hadda beetle, *Epilachna vigintioctopunctata* (Coleoptera: Coccinellidae):

This is polyphagous pest, and feed predominantly on cucurbits, tomato, potato, and kidney bean as well as brinjal. This beetle is considered to be one of the most serious groups of pests damaging brinjal.

Nature of Damage: This pest beetles as well as grub scrape the chlorophyll from the epidermal layers of the leaves. They eat up regular areas of the leaf tissue, leaving parallel bands of uneaten tissue in between. The leaves, thus, present a lace-like appearance. They turn brown, dry up, fall off and completely skeletonize the plants.

Life cycle: Each females lays yellow cigar shaped about 100-400 eggs in cluster mostly on the lower leaf surfaces. The grub is creamy white or yellowish in color with black spiny hairs on the body and grub period is two to five weeks depending on the temperature. Grubs pupate on the leaves and stem. The pupa bears spiny hairs on the posterior, but not the anterior, part of the body. The pupal period is one to two weeks. These brownish or orange colored, hemispherical beetles are larger than other ladybird species. *E. vigintioctopunctata* has 28 black spots on the forewing. Pest passes through several broods from March to October and its population is at maximum at the end of April or in early May.

Management: Collect damaged leaves with grubs and egg masses and destroy them. Shake plants to dislodge grubs, pupae and adults and destroy. Conserve natural enemies in brinjal ecosystem. Spray Carbaryl 50 WP @ 3g/lit. Use malathion 50EC @ 2ml/lit of water at 15 day intervals.

5. Brinjal lace wing bug, *Urentius hystricellus* (Hemiptera: Tingidae): The lace wing bug is distributed in the north western parts of Indian sub continent and is common in the plains. Except for brinjal, it has not been recorded feeding on any other plant.

Nature of Damage: The nymph and adults suck the sap from leaves and cause

yellowish spots which, together turn with black scale like excreta and exuviae deposited by them. The pest is most abundant in August-September. When the attack is severe, about 50 per cent of the crop may be destroyed.

Life cycle: A female bug lays about 75 shining white nipple shaped eggs singly in the tissues on the underside of leaves. The nymphs feed gregariously on the lower surface of the leaves, but fully developed nymphs are found feeding and moving about individually on the lower surface as well as on the upper surface of leaves. Adult bugs are straw colored and this insect passes through 8 overlapping generations in a year.

Management: Spray dimethoate 30 EC @ 1 lit/ha or methyl demeton 25 EC @ 1 lit/ha

6. **Stem borer, *Euzophera perticella* (Lepidoptera: Pyralidae):** The stem borer is a minor pest of brinjal and is widely distributed in India. This oligophagous insect feeds mainly on eggplant, and sometimes on other solanaceous plants such as tomato, potato, and chilies.

Nature of Damage: Larva starts boring into the stem near ground level and in the branching area or in leaf axis which results top shoots of young plants droop and wither. The Older plants become stunted.

Life cycle: The cream colored eggs are laid either singly or in groups on the tender leaves, shoots, and petioles. The Fully grown larva is creamy white in colour. Larvae pupate within silken cocoons inside the feeding tunnel in the stem or in the soil. The medium-sized moth is greyish brown, fore wings have transverse line and hind wings are white in colour.

Management: Remove and destroy the infested plants. Avoid ratoon cropping. Light trap @1/ha to attract and kill adults. Apply Neem cake in the soil to reduce the incidence of stem borer. Avoid using synthetic pyrethroids causing resurgence.

7. **Aphid, *Aphis gossypii* (Hemiptera: Aphididae):** This is a cosmopolitan pest and highly polyphagous. It prefers to feed on cotton, cucurbits, eggplant, and okra. Aphids occur during the cool dry season.

Nature of Damage: Both nymphs and adults suck the plant sap. They occur in large numbers on the tender shoots and lower leaf surfaces, and suck the plant sap.

Slightly infested leaves exhibit yellowing. Severe aphid infestations cause young leaves to curl and become deformed. Like whitefly, aphids also produce honeydew, which leads to the development of sooty mould.

Life cycle: They usually reproduce through parthenogenesis (development of embryo without mating with males) and are viviparous (give birth to nymphs directly rather than eggs). The adult color is highly variable and it varies from light green to greenish brown. Both wingless and winged forms occur. They possess a pair of black colored cornicles on the dorsal side of 5th and 6th abdominal segment.

Management: Grow eggplant seedlings in insect-proof (50–64 mesh) net houses, net tunnels, greenhouses, or plastic houses to avoid early infestation. The ladybird beetles (*Menochilus* sp. and *Coccinella* sp.) and green lacewings are efficient predators of aphids. Inundative release of ladybird beetles @ 200 pairs per ha at fortnightly intervals can suppress the aphid population. Spray Methyl demeton 25 EC 2 ml/lit or Dimethoate 30 EC 2 ml/lit to control aphid. Release 1st instar larvae of green lace wing bug (*Chrysoperla carnea*) @ 10,000 Nos./ha.

8. Brown leaf hopper: *Cestius phycitis* (Hemiptera: Delphacidae)

Adult: Small light brown leaf hopper

Nature of Damage: Reduction in size of leaves and shortened the petioles. Due to excessive growth of branches general stunting of plants. Brinjal floral parts convert into leafy structure and plants become bushy. This pest is act as vector of little leaf of brinjal.

Management: Remove infected plants, destroy them and Spray with dimethoate 0.3%. Before transplantation dip the seedlings in 0.2% carbofuran 50 STD solution (control insect vectors).