

Integrated Pest Management in Brinjal

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Brinjal or egg plant is a very popular and extensively grown solanaceous vegetable all over the world. One of the major constraints noticed in its production is the increasing incidence of various insect pests which cause a great amount of yield loss estimating about 35-40%. Due to its tender and succulent nature and its cultivation under high moisture and



input regime, brinjal is very susceptible to attack of various insect pests at different growth stages. To alleviate the losses caused due to insect pests, a huge amount of pesticides is being used which has led to problems like environmental problem, resistance, resurgence and also create threat for useful flora and fauna. Some vegetables which are harvested at short interval are likely to contain high amount of pesticide residues which is harmful for the consumers. In this context Integrated Pest Management (IPM) approach is gaining motion as it is more reliable and eco-friendly. Here we will discuss about some of important insect pests of brinjal and their management in an integrated way to manage the pests which will help the growers to get maximum returns.

Shoot and fruit borer

Scientific Name - *Leucinodes orbonalis*

Family–Pyralidae

Order - Lepidoptera

Economic Importance: It is one of the most serious pest of brinjal fruits and plants widely distributed all over India and is found associated with a number of host plants. The infestation on brinjal can be as high as 70 per cent.

Marks of Identification: Creamy white eggs, Full grown larva is light pink measuring about 12mm long, Pupa is grayish boat shaped cocoon, the moths are medium sized, wings are whitish with large brown patches all over with wings expanse of 22-26mm.

Life history: A female lays on an average 250 eggs on leaves, shoots or sometimes on fruits. Incubation period is 3-5 days, larva become full grown in 7-13 days. The full grown larva comes out and pupation takes place in boat shaped cocoons on the plant itself. The pupal period lasts about 7-10 days. Adults live for 2-3 days. The pest is active throughout the year.

Nature of damage: Infestation starts after few weeks of transplanting. The caterpillars bore into the growing shoots or petioles and feed on internal tissues. As a result of damage, affected shoots wither and plants exhibit the symptoms of drooping. After fruit formation, larva make their entry under the calyx when they are young. The holes later plugged with excreta leaving no visible sign of infestation. Large holes seen on the fruits are the exit holes.

Host plants: Besides brinjal, the pest is also known to infest potato, bitter gourd, pea pods, cucurbits etc.



Management:

- Removal and destruction of affected shoot and fruits along with larvae
- 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: *Pristomerustestaceus*, *Cremastusflavoorbitalis*
- Avoid use of synthetic pyrethroids
- Avoid using insecticides at the time of fruit maturation and harvest.

- Neem seed kernel extract (NSKE) 5 %
- Spraying with 0.05% Monocrotophos 36 WSC or 0.2% carbaryl or dusting with 10% Carbaryl 3-4 weeks after transplantation subsequent application 15 days thereafter controls the pest effectively

1. Stem borer

Scientific Name – *Euzopheraperticella*

Family- Crambidae

Order- Lepidoptera

Marks of Identificaion : Eggs cream, scale like,fully grown larva creamy white in colour, adult greyish brown, forewings have transverse line and hind wings are white in colour.



Nature of damage: Top shoots of young plants droop and wither, older plants become stunted, fruit bearing is affected

Management:

- Collect and destroy the damaged and dead plants
- Light trap @1/ha to attract and kill adults
- Spray neem oil 2ml/lit
- Avoid using synthetic pyrethroids causing resurgence

1. Lace wing bug

Scientific Name – *Urentius hystricellus*

Family –Tingidae

Order - Hemiptera

Economic Importance: It is minor pest of brinjal in the State of Maharashtra.



Marks of Identification: White nibble shaped eggs, Nymphs are oval, greenish yellow with few black dots, Adults are oval in shape, straw coloured dorsally and black on the ventral side measuring about 3mm long. Pronotum and forewings reticulated.

Life history: Eggs are laid on lower surface of the leaves. A single female lays about 35-45 eggs, which hatch within 4-12 days. Nymph moults 5 times in a period of 10-21 days. Adults' longevity is 30-40 days. There are 8 overlapping generations in a year.

Nature of damage: It is specific pest of brinjal. Nymphs and adults suck the cell sap from leaves, affected leaves become yellowish and lower surface are found covered with black insect excreta. The summer crop suffers comparatively more.

Management:

- Spray Dimethoate 30 EC @ 1 lit/ha or Methyl demeton 25 EC @ 1 lit/ha

4. Hadda / Spotted beetle

Scientific Name –*Henosepilachnavigintioctopuntata*

Family- Coccinellidae

Order- Coleoptera

Marks of Identification : Eggs are cigar shaped and yellow in colour, Grubs are yellowish bearing six rows of longitudinal spines, Pupa is yellowish with spines on posterior part and anterior portion being devoid of spines, Adults are deep red in colour having 14 spots on each elytra.



Life history: Eggs are laid on the lower surface of the leaf in a group. Egg stage lasts for 3-4 days and grub stage for 10-35 days. Pupation takes place within the leaf or stem and duration is 7 days. Total life cycle is 17-50 days depending on climate.

Nature of damage: Scrapping of chlorophyll , skeletonization and drying of leaves.

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

5. Jassids

Scientific Name:- *Amrasca bigutulla bigutulla*

Family- Cicadellidae

Order-Hemiptera

Marks of Identification: Adults are green colour slender insect and nymphs are different in colour having wedge shaped body. They walk diagonally. Front wings having a black spot on each, at the apical margin and two black spots on the vertex of the head.



Life history: Whitish eggs are laid along leaf veins, which hatch within a week. Nymph moults 5 times and become adults within weeks. A generation is completed in a period of one month.

Nature of damage : Polyphagous pest cause serious damage by sucking leaf sap. The nymphs and adults suck the sap from under surface of the leaf and the infested leaves curl upward in margin. It injects the saliva while feeding and the damaged leaves are crinkled with stunted growth. Reddish brown colour at the leaf margin called as 'Hopper burn' symptom.

Management:

- Spraying with 0.05% endosulfan, 0.03% Dimethoate or thiometon and 0.02% phosphamidon control the pest effectively
- Avoid use of nitrogenous fertilizer and follow recommended spacing
- Use of yellow sticky trap

- Grow resistant varieties like Punjab Chamkila, GB-1 and GB-6

Root Knot Nematode: *Meloidogyne incognita*

Nature of Damage: More detrimental to seedlings. Affected plants show stunted growth along with chlorotic symptoms on leaf and fruit setting is drastically affected. When the plant is uprooted, numerous galls can be observed on the roots.

Management:

- Treat the nursery beds with Carbofuran 2g a.i. /m²
- Trap cropping with Marigold (*Tagetes*Spp)
- Crop rotation with non solanaceous crops.

Besides these White fly (*Bamisiatabaci*), Aphid (*Aphis gossypii*) Ash weevil (*Mylocerussubfasciatus*) , Brown leaf hopper (*Cestiusphycitis*) etc also cause severe damage to brinjal crop.

Leaf Eating Beetle (*Epilachana vigintioctopunctata*): The yellowish coloured grubs and adults feed voraciously on the leaves and tender parts of the plant and often cause serious damage when they appear in numbers. As a result, the leaves are completely skeletonized leaving only a network of veins.

Control: Collection and destruction of infested leaves along with the grubs, adult and eggs reduces the pest incidence. Spraying the crop with Malathion (2ml/litre of water) or Carbaryl (2-4 g/litre of water) effectively controls the pest.

Jassids (*Amrasca biguttula biguttula*, *Cestius (Hishimonus) phycitis*): Both nymphs and adults suck the sap from the lower surface of the leaves. The infested leaf curl upward along the margins, which may turn yellowish and show, burnt up patches. They also transit mycoplasma disease like little leaf and virus disease like mosaic. Fruit setting is adversely affected by the infestation.

Control: Jassids are controlled by spraying Malathion (0.1%) or Dichlorvos (0.05%) 20 days after transplanting.

Leaf Roller (*Eublemma olivacea*): Caterpillars roll leaves and feed on chlorophyll while remaining inside the folds. The folded leaves wither and dry up.

Control: Collection and destruction of infested leaves along with insects in the initial stage help to minimize the infestation. Spraying of Carbaryl (0.1%) or Malathion (0.05%) controls the pest effectively.

