

# ENVIRONMENTALLY SOUND MANAGEMENT OF BRINJAL STEM BORER (*EUZOPHERA PERTICELLA* RAGONOT) FOR SAFE FOOD PRODUCTION

## Abstract

Brinjal (*Solanum melongena* Lin.) is a seasonal vegetable crop and grows well in arid and semi-arid climatic condition. This crop is cultivated 2-3 times in a year. The fruit is the edible part and contains higher nutrition value and may compare with fruits of tomato. Different (mite, nematode etc) pests are responsible to limit in the successful production of its fruits. Large number of pests attack to eggplant/brinjal crop and reduce its yield which is a great problem to the farmers. Eggplant stem borer *Euzophera perticella* is an oligophagous insect observed many areas in Asia including India. It attacks mainly on brinjal and often on some other solanaceae vegetables, viz. potato, tomato, and chilli. Stem borer is sometimes reported as a severe pest in India. Tiruchirapalli district of Tamil Nadu and some areas of West Bengal it is treated as an important pest. The caterpillars mainly cause harm as an internal stem feeder. Top shoots of young aged plants drop and dry. Old plant becomes stunted. Fruit bearing is affected. The insect causes damage from March to October when the temperature is high enough. Different types of procedures are effective for management of the pest. The pest may be controlled through IPM which contains cultural, mechanical, physical, behavioural, microbial, biological, genetical method etc. Finally, small amount of pesticides should be used if its damage is very high.

**Keywords:** Seasonal fluctuation, bio-control, life-history, organic cultivation, sustainable management

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## I. INTRODUCTION

Vegetables rank an important place as food just next to cereals and a source of many nutrients viz carbohydrates, vitamins, proteins, minerals and energy (N.R.C., 1978). It also supply to human body the dietary fibers contained of cellulose, hemicelluloses, lignin and protein. These fibers and along with their roughage play a vital role on gut function because of their bulk, having ability to absorption of water and substrates for general bacterial flora of intestine (Jones, 1978).

The origin of eggplant (*Solanum melongena* Lin.) is India, and it is cultivated for over 4000 years. It ranks second in total production just after potato, the brinjal cultivation continues as a major domestic crop across the country. Its cultivation accounts about nine per cent of total vegetable production with coverage of 8.140 % area under cultivation of vegetables. Economically it is very important vegetable crop and cultivated about 1.70 million ha throughout the world having a production of 29.460 million tones. Its average productivity is about 17.430 tons/ ha in the year 2004-2005. In India, eggplant is grown of 0.510 million ha and annual production of 8.200 million tones. Productivity of brinjal in India is about 16.080 tons/ hectare during 2005-2006. The eggplant is included to Solanaceae family and its genus *Solanum*, spp *melongena*. Some synonyms to brinjal is egg plant, Guinea squash are. This vegetable crop is a native of India. Its secondary origin is China and S-E Asia (Nath *et al.*, 1987). The brinjal crop was well known to Indians from ancient time (Decando Le, 1986). The real centre of origin is India and China is treated as secondary centre of origin (Thompson and Kelly, 1957). Its cultivation is widely done in both temperate and tropical areas of the world (Rai *et al.*, 1995). It is grown throughout the year in many parts of India including W. B. (Ghosh, 1999) & Bangladesh (Singh, 1967).

Pest constraints of this crop are enough high in West Bengal including in N. Bengal, and causes enough damage as well as hamper yield and their management is difficult (Ghosh and Senapati, 2002, Ghosh, *et.al.* 2003). Pests management by application of chemical synthetic insecticides is not recommended as causing many abnormalities, viz environmental pollution, health hazards killing of different micro flora and micro fauna etc. It also lifts natural control of the pests by destroying defenders of the pest like spider (Ghosh *et.al.*, 2006a), *Menochilus* (Ghosh *et.al.*, 2007), *Coccinella* (Chakraborty and Ghosh,2010; Ghosh, 2016). Among the harmful insect pests of brinjal which cause limits of production, shoot and fruit borer, *L. orbonalis* Guen is declared as the major pest as well as a harmful insect pest in eggplant cultivation regions including West Bengal (Banerjee and Basu, 1955 &1956 ; Ghosh and Senapati,2001a; Ghosh and Senapati,2009; Ghosh,2014) Therefore, shoot and fruit borer ranks 1<sup>st</sup> as the key pest that affects directly the fruit yield and its fruit quality. The other Lepidopteran pests where larva causes heavy damage in West Bengal are leaf roller (*Eublemma olivacea* Walk.) and stem borer (*Euzophera particella*) (Ghosh, 1999). The harmful Hemipterous pests that cause enough damage are Aphid (Ghosh *et.al.*, 2004a, Ghosh,2019), leaf hopper (Ghosh, and Senapati 2003), Thrips (Ghosh *et.al.*, 2005) and Whitefly (Ghosh *et.al.*, 2004b). The harmful Coleopterous pests that cause heavy damage are Hadda beetle (Ghosh, and Senapati 2001b), Flea beetle (Ghosh *et.al.*, 2006b) and Blister beetle (Ghosh,2020). Among the non-insect pest, mite pest (*Tetranychus cinnabarinus* Boisd.) is treated as very harmful to brinjal (Ghosh and Chakraborty, 2014, Ghosh, 2019). Other non-insect pest root-knot nematodes are designated as an important plant pathogen, which affect world's food production (Sasser, 1980). Alternate hosts of nematodes are cereals, other

vegetables, oilseed crops, pulses, fibre crops, fruits, ornamentals, plantations etc. grown in various regions of the world. They are also damaged by nematodes but vegetable crops including brinjal are seemed as their preferable host crops. Quantitative as well as qualitative damage to the crops are done by this nematode.

Favourable climatic condition, presence of large number alternate host plants particularly some crops of solanaceous family and a number of weeds make many insects and non-insect pests to appear as very harmful form. Insect pests provide main limiting factors in the proper cultivation of eggplant. Least work is done, and many spending in the preparation of land, manure application, transplanting of seedlings may all be undone by the ravages of insect pest. The crop damage is done by direct feeding or by dissemination of harmful organisms from diseased plants to healthy plants. The crop is harmed by many pests:

Common name	Scientific name	Systematic position	Attacked plant parts
Shoot & fruit borer	<i>Leucinides orbonalis</i> (Guen.)	Family: Pyralidae Order: Lepidoptera	Shoot& fruit
Hadda beetle	<i>Henosepilachna vigintioctopunctata</i> Fabr.	Fam. : Coccinellidae Order: Coleoptera	Leaf
Brinjal leaf roller	<i>Eublemma olivacea</i> Walk.	Fam.: Noctuidae Order: Lepidoptera	Leaf
Brinjal stem borer	<i>Euzophera particella</i> Rag.	Fam.: Phycitidae Order: Lepidoptera	Shoot
Lace-wing bug	<i>Urentius sentis</i> Dist.	Fam.: Tingidae Order: Hemiptera	Leaf-area
Aphid	<i>Aphis gossypii</i> Glov.	Fam. Aphididae Order: Hemiptera	Leaf
Leaf hopper	<i>Amrasca biguttula biguttula</i>	Fam. Cicadellidae Order: Hemiptera	Leaf
Thrips	<i>Thrips tabaci</i> Lin.	Fam. Thripidae Order: Thysanoptera	Leaf
Whitefly	<i>Bemisia tabaci</i> Genn.	Fam. Aleyrodidae Order: Hemiptera	Leaf
Flea beetle	<i>Phyllotreta</i> spp.	Fam.: Chrysomelidae Order: Coleoptera	Leaf
Mite	<i>Tetranychus urticae</i> Boisd. <i>T. neocaledonicus</i> Andre	Fam.: Tetranychidae Order: Acarina	Leaf
Root-knot nematode	<i>Meloydogyne incognita</i> White	Fam.: Heteroderidae Order: Tylenchida	Roots

## II. COMMON NAME

The Brinjal Stem Borer or Egg plant Boring Caterpillar

### III. SCIENTIFIC NAME

*Euzophera perticella* Rag.

### IV. TAXONOMIC TREE

Class : Insecta  
Order : Lepidoptera  
Family : Pyralidae  
Genus : *Euzophera*  
Species : *Perticella*

### V. STATUS OF *EUZOPHERA PERTICELLA* AS PEST

Eggplant stem borer *Euzophera perticella* has been considered as an oligophagous insect pest. This pest causes damage mainly in India. The damage of the pest on brinjal plant was first recorded in Hyderabad by Rizvi and Sanyal (1977). The pest feeds and causes damage mainly on brinjal. Often it also attacks on many crops like tomato, potato and chilli. This pest is usually seemed as a minor pest of brinjal (Swamy and Satpathy 2007, Rai *et al.*, 2014) but sometimes it attacks severely infestation becomes very high (Yadav and Kumawat 2013, Anonymous, 2014). Often this pest is found to be a serious pest in India and causes heavy damage (Akhtar and Khawaja 1973, Anonymous 2014). In India, Tiruchirapalli areas of Tamil Nadu (David *et al.*, 2001) and some areas of West Bengal the pest is declared as a major one (Anonymous 2006). Details Literatures of attack of stem borer on brinjal plant are very scanty, particularly its biology, population dynamics and certain damage intensity of the borer of eggplant and its defenders.

### VI. APPEARANCE / MORPHOLOGY / MARKS OF IDENTIFICATION

It is a medium sized moths, forewings pale yellow having distinct vertical black lines (transverse line) in the middle of the wing and hind wings are whitish and abdomens are pale-yellow. Wing expanse is 26 mm in male and 32 mm female Eggs are cream, scale-like. Fully grown larvae are creamy white.

### VII. DISTRIBUTION

This insect is limited in distribution. The stem-borer of brinjal is widely found in India and Sri Lanka. It is a major pest in Tamil Nadu, W.B , Uttar Pradesh etc province of India.

### VIII. HOST RANGE

The host range of this borer pest is very high. This insect mainly attacks and feeds on brinjal plant. It is reported that this pest also attack other solanaceous crops like potato, tomato, and chilies. Though this is not a serious pest, but sometimes infestations become serious.

## IX. BIOLOGY AND LIFE CYCLE

The pest starts their activity from March and remains active to October and its larva hibernates inside the stem of the crop from Nov. to the beginning of March. The Overwintered larvae pupate at the beginning of March and emerge as moths in the second half of the month. The females lay eggs immediately after mating.

1. **Egg:** The eggs are cream coloured scale-like and are laid singly or in batches on tender leaves, petiole, and branches. The eggs are to be seen elongate & flat. One female may lay 104-363 eggs in its life span of about 7 days. The incubation period lasts 3-10 days.
2. **Larva:** The emerged larva starts feeding for a few minutes on the open plant parts and then bore into the stem making longitudinal tunnels. The larva is full-fed within 26-58 days after passing four or five stages. The larva is looking like whitish or yellowish white in color having several bristly hairs and its head is orange-brown or red. The measurement of full-grown larva is 1.50 to 2.0 cm long. The larval lasts about 4-8 weeks and this variation takes place due to the temperature.
3. **Pupa:** Larva pupates in the silken cocoons inside the feeding tunnel of the stem of the brinjal plant. It sometimes pupates in the soil. Pupa is dark brown and 12 mm in length. The life span of pupa is about 1-2 weeks.
4. **Adult:** Moth generally emerges in six to eight days. The life-cycle is completed within 35-76 days. It has 5-6 overlapping generations per year.
5. **Life History Described by Halder *et al.* (2017):** The neonate larva of stem borer is slight yellowish green. There are 4 instars of larvae. Larval period may vary from 29 to 47 days. Average larval period is 38.40 days. The third instar larva is whitish and having blackish hairs on its body. The fourth instar larva is larger in size (14.5–19.25 mm in length). The head capsule is sclerotized and brown in colour, sparsely clothed with white minute hairs. The dorsal area of the body is brown spotted. The whole body is clearly segmented. In most cases pupation takes place in feeding galleries inside the stems of the brinjal plant. Sometimes pupation takes place in the soil. The obtect pupae are light brown in colour and having spindle shaped fibrous cocoon. The pupal period varied from 7 to 14 days. The average pupal period is 10.10 days. Adults are medium sized moth and its forewings are pale straw yellow and prominent dentate vertical black lines are found beyond middle of the wing. The hindwings are whitish. Adult longevity ranges from 4 to 13 days. The adult female survives longer (average 8.68 days) than the adult male (6.08 days). Mating takes place in most cases during night. The gravid females lay eggs singly on the young leaves, petioles and tender stems. Freshly laid eggs are oval in shape, light yellowish and it turns to yellowish brown before hatching. The oviposition period varies from four to eleven days. Egg viability may range 79-90% and an average of 83.90%. The incubation period varies from three to nine days. The pest activity is continued from February to October and hibernates in the stem of old plant as larva from November to February in Varanasi areas, Uttar Pradesh, India. Swamy *et al.* (2006) notices that incubation period varied from three to ten days, moths emerged in six to eight days and the pest completed life cycle in 35- 75 days.

## X. NATURE OF SYMPTOMS AND DAMAGE

The caterpillars cause damage by feeding inside the stem. Newly emerged caterpillars bore in to the stem and move down ward by making a tunnel inside the stem. Just after hatching, the larva bores inside stem at ground level. In most cases, the larvae bore in the branching portion and in leaf axils and they seal the opening holes with excreta. There is a thickening of stem in the entry portion. Larvae move by feeding downward along the length of main stem. This feeding result in stunted growth or wilting and drying of the total plant and fruits bearing capacity is also reduced. The plant growth at the later stages is most vulnerable for attacking of the pest. The upper shoots of young plants drop and dry. Old plant becomes stunted. Fruit bearing capacity of the crops is severely affected.

### Damage Described by Halder *et al.*, (2017)

Hundred % plants are infested by this stem borer insect pest During June–July. This infestation leads to discard attack of the aged plants and re-sown the new plant. Reports come from many farmers about this type of problem. Initially infected plants turn light yellow with stunted growth. Also reports that patches are found in the field. Later on the infested plants are completely drooped, dried and wilted. Plant vigour is reduced and fruiting capacity of the plants are affected and lowered. Larvae of this stem borer, damage the stem of brinjal by feeding the pith and so translocation of fluid or water through the xylem are reduced. The affected plants are detected by the symptom of drooping nature. They may be uprooted and bring to bio-control laboratory for examination. Proper observations prove that distinct larval galleries filled with faecal matters are found inside stem and its underneath. Larval tunnels may vary from 3-11 / plant and an average of  $7.92 \pm 0.69$  tunnels per plant. Tunnel length may vary from 8.40 – 21.30 cm and an average of 12.80 cm. On deep observation, it is observed that majority of the larvae (84.61%) exhibit (+) geotropic movement towards root region, except few (15.39%) showing opposite direction. The larval movement is observed by comparing the dia of the tunnel on which they feed. Pupation takes place usually inside the stem. They remain within brown fibrous cocoon. Exit points of adults are found inthe branch or any injured portion of branches. Often many borer larvae generally use one exit point.

## XI. SEASONAL FLUCTUATION

The pest is active form March to October when the temperature is high enough. They hibernate as larvae inside the old plant stem during winter from November to the beginning of March. The pests emerge as moths in the second half of March.

### Incidence Described by Halder *et al.* (2017)

Population dynamics of the stem borer at field level is observed from beginning of third week of Feb with 13.50% damage stem and branches and step by step increase with increase the temperature. The damage of the stem during March, April, May and June are 29.75, 51.50, 76.50 & 89.70%, respectively. About all plants are infested by the stem borer in July. In June–July, about 100 % plants are infested by the stem borer and that lead to discontinuation of aged plants and re-sown new plants. The lower temp during winter limits its growth and the larva goes to hibernation. This results as is evident from no incidence or very little incidence of the stem borer insect during Nov to mid of Feb, at Varanasi, India. In

a case study, it is observed that infestation of this borer found generally in later stage of brinjal plant (Anonymous 2008). Sathe *et al.* (2016) observed incidence of brinjal stem borer, appeared in Oct to March in Kolhapur areas of Maharashtra, India. Satpathy *et al.* (2006) reported that in July, 15 to 34% brinjal crops were damaged, whereas in August the intensity of damage increased and average crop damage was 49.45% showing 3 times increases in damage within one month.

## XII. XMANAGEMENT OF THE PEST

### 1. Management Practices in Brief

- Destruction of the damaged, dried & dead plants.
- Use of light traps @ 10-12/ha for attracting and killing the adults.
- Ratoon cropping should be avoided. When the attack of this borer is serious, the rationing of brinjal plants should be discontinued. The withered plants should be up rooted and burnt.
- Protecting the population of the parasitoids such as *Pristomerus*. minimum use of the chemical insecticides may increase the activities of the natural defenders of stem borer. The larvae are parasitized by *Pristomerus testaceus* Mori. And *P. euzopherae* Vier.
- Avoid the use of synthetic pyrethroids which may cause resurgence of the pest.
- Use of neem cake in soil may reduce heavy incidence of this borer.
- Spraying neem oil @ 2.50 ml/litre of water.
- Application of recommended pesticide, if situation demands so.
- Application of safe pesticides in the soil in consultation with the local extension staff, if necessary.
- Four sprays 315 ml of dichlorvos (DDVP)76 EC, in 625 litres of water/ha should be given at 15 days intervals.
- Spray the following insecticides starting from one month after transplanting at 15 days interval; NSKE 5%, Azadirachtin 1.0% or Fenprothrin 30 EC or Thiodicarb 75 WP spray should be repeat at 15 days interval.

**2. Harmful Effect of Chemical Insecticides:** Since the discovery of insecticide action of DDT in 1939 by Dr. Paul Muller, there had been a great expansion in the use of chemicals for pest control. Pesticides during manufacturing, transportation, storage and actual use enter in the abiotic and biotic components of the environment through air, water and soil, and disturb ecosystem, causing great disaster sometimes. Miss Rachel Carson in her book "Silent Spring" in 1962 knocked the people referring forceful account of dangerous effect of chemical pesticides to nature. Today the environmental pollution is a great problem. The chemicals are accumulated to the environment by being transported from one system to another. These contaminate every system like air, soil, water, plants animals etc. Although pesticides are protecting the Agri-horti crops from insect and other pests for increasing up the agri-horti production but introduce ecological misbalance and environmental pollution. A large number of chemical pesticides viz BHC, dieldrin, aldrin, toxaphene, methyl parathion, heptachlor, chlordane, phorate etc. are being used in India for the management of termite, white grub, cutworm, root borer etc. It is found that the pesticides disturb microbial activity in the soil, adversely affect the earth worm and may

be harmful to predatory mites and carabid beetles. They may adversely affect some invertebrate animals that were responsible soil fertility. The uptake of chemical pesticide residues by many plants has adverse effect on our health. The people around vicinity of pesticide factories even up to 5-7 km area badly feel off flavor and such suffocated environment ultimately results in different kind of diseases among the residents. The contamination of air during pesticide application may also take place which could pose serious health hazards, if the concentration in air rose above the threshold values. Different doses of pesticides at different dose levels are being used on the different types of crops against noxious pest all over the country for the last four decades. Saxena *et al.*, (1990) reported that the residue of malathion was found more than the permissible limits in tomato, okra, cauliflower, brinjal and beans. Gupta *et al.*, (1987-88) reported that above 60% samples of potato, brinjal, cabbage, cauliflower okra and cucurbits were containing the residues of organophosphatic insecticides more than the permissible level. Water has been found contaminated with pesticides by different ways. Many great rivers of the world have been found to contain large amount of chemical insecticide residues which kill fishes and many aquatic animals (Srivastava and Saxena, 1989). In order to destroy unwanted plants, insects and fishes etc. the deliberate use of pesticide is being done due to which water is contaminated. Water has also been found to be contaminated with pesticides through run off from fields, through sewage disposal, through the effluents of industries using pesticides, through dead and decayed plants treated with pesticides. In UK the presence of insecticides was reported in rain water. Fresh rain water on the mountain top of the Himalaya was found possessing pesticide residues. Some common cultivated plants, vegetables and fruit are observed to be affected with indiscriminate use of chemical insecticides from germination to harvest. High dose of chemical insecticides may create resurgence of harmful pests against applied pesticides, the outbreak of many unimportant pests. The chemical insecticides are also harmful to beneficial insects such as honey bees and defenders like parasites, predators, pathogens etc. As a result of pesticide pollution, the living beings are affected in several ways. Human beings and domestic animals are infected by a number of diseases if chemical pesticides are applied

- 3. Details Study of Predators and Parasitoids of Brinjal Stem Borer (Halder *et al.*, 2017):** *Pristomerus euzopherae* Viereck (Hymenoptera: Ichneumonidae) an endoparasitoid was separated from *E. perticella*. The length of adult female is 7.50 to 8.0 mm (excluding ovipositor). Body colour is pale yellow. It has mandibular apices, claws, antennal flagellum. The bases of all gastral segments are black. The meso-thorax has 3 black patches. Head and thorax are punctuate. The gastral segment I and II are aciculate. Wings have hyaline colour, All the veins and stigma of the wings are dark. Fore and middle legs are found pale yellow in colour. Black patches are found on hind legs, and hind femur consists of a distinct spine. The parasitization by *P. euzopherae* is observed first in 3<sup>rd</sup> and 4<sup>th</sup> week of April when 1.91% stem borer larvae are parasitized. From the month of April onwards, rate of parasitization is step by step increased and the highest level of parasitization (12.48%) is found in July - June (7.73%). This is first record of *P. euzopherae* as an endoparasitoid of this borer from Varanasi areas. The adult female parasitoid begins oviposition from first day. During oviposition, the female inserts her abdomen to penetrate its ovipositor into host larvae remaining inside the stem to lay eggs. The lifespan of *P. euzopherae* females varies 7.50-13.75 days and an average of 10.63 days in lab conditions. Jiménez *et al.* (2000) reported that the first generation of *P. spinator* females (F<sub>1</sub>) is a parasitoid of potato tuber moth (*Pthorimaea operculella*) and its



mean lifespan is 33.50 days. The second generation females ( $F_2$ ) lives 10 days less than  $F_1$

**4. IPM (Integrated Pest Management) on Brinjal:** IPM on brinjal/eggplant and other vegetable crops is in a different stage of development in different countries but is becoming increasingly more important with the problems such as resurgence of pests. IPM usually involves using pest threshold for treatment, decision, appropriate cultural practices and giving priority to microbial and other selective insecticides to protect natural enemies. Some countries also employ additional elements such as light trapping, use of sticky traps, and physical barriers using netting. On implementation emphasis is given to understanding farmers' knowledge, attitude and practices in pest control and in guiding them to think IPM through participatory training and field demonstration.

**5. Future IPM Strategy for Terai Region:** The changing nature of ecosystem results in equally changes in pests problem. The values of control techniques in time and with such variable like ecological understanding of the phenomena, development of technology and differences in economic injury levels. Thus IPM devised once cannot be a permanent solution to pest problems of crop. With the rapid change of technology and dynamic nature in cultivation system, pest control strategy is likely to be going on changing constantly. In perspective of this situation more and more programme for research to be conducted to formulate IPM modules of various crops under different agro-ecological situation and subsequent field testing through direct involvement of farmers to be organized to the following areas.

- Development of surveillance at last for major pests of vegetable crops in order to develop a forecasting system through interaction between crop phenology and insect phenology to avoid pest attack.
- Identification of ecological barriers for both pests and natural enemies.
- Development of cultivars/germplasms against harmful insect-pests.
- Exploiting non-chemical control of insect-pests such as physical, cultural, mechanical and biological control measures on different crops.
- Testing of bio-pesticides like microbials and botanicals in the laboratory and subsequently in the field under different crop eco-system.
- Mass production of bio-agents under IPM.
- Judicious / need based application of pesticides at a minimum dose.
- Testing of IPM technologies in different crops whenever developed.

Failures of IPM are generally occurred because of lack of direct involvement of farmers. Farmers' acceptance of IPM is related to their initiative understanding of the eco-system and to their perception/experiences. Thus training which provides the motivation and confident decision making capabilities give better results. Following training programme for IPM can be drawn for vegetable crops in pesticide intense system.

- Crop growth oriented agro-ecosystem analysis on the basis of seasonal incidence of pests and beneficial organisms.
- Understanding the role of naturally occurring beneficial organisms.
- Economic threshold level (ETL) and Economic injury level (EIL) of pest population.

- Resistant varieties.
- Harmful effects of pesticides on beneficial organisms that includes parasites, predators, frogs, fishes and honeybees.

Lastly, for evolving IPM strategies that would be appropriate and suitable in different agro-ecological zones for different crops expanded research and adequate investment are necessary. Success in crop production sustainability is largely dependent on availability of dedicated plant protection personnel, a pragmatic public policy and a determined political will in the coming years.

### XIII. CONCLUSION

Brinjal is cultivated in both temperate and tropical region of the globe. It is cultivated throughout the year in the most part of India including and Bangladesh. Favourable climatic condition, presence of large number alternate host plants particularly other solanaceous crops and weeds make a number of pests to emerge as major pest. Insect pest provide the major limiting factors in the better cultivation of eggplant. Least work is done, and many spending in preparation of land, application of manures and fertilizers and transplantation of good seeds may all be undone by the ravages of insect pest. The damage of crop is done by direct feeding on the plants or by dissemination of harmful organisms from diseased to healthy plants. The values of control techniques in time and with such variable like ecological understanding of the phenomena, development of technology and differences in economic threshold levels. Thus IPM programme cannot be a permanent solution to pest problems of crop. With the rapid changing of science and technology and constantly changing nature in cultivation system, pest management strategy is likely to be going on changing.

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