



**Biotica  
Research  
Today**  
Vol 3:5 348  
2021 350

## Key Pests of Okra and Their Eco-Friendly Management

Mukesh Sehgal<sup>1\*</sup>, Meenakshi Malik<sup>1</sup> and Ardhendu Chakraborty<sup>2</sup>

<sup>1</sup>ICAR- National Research Centre for Integrated Pest Management, Pusa Campus, New Delhi, Delhi (110 012), India

<sup>2</sup>Krishi Vigyan Kendra-Khowai, Divyodaya, Chebri, Khowai, Tripura (799 207), India

### Open Access

#### Corresponding Author

Mukesh Sehgal

e-mail: [msehgalncipm@aol.com](mailto:msehgalncipm@aol.com)

#### Keywords

Diseases, Management, Okra, Pests

#### Article History

Received in 13<sup>th</sup> May 2021

Received in revised form 21<sup>st</sup> May 2021

Accepted in final form 22<sup>nd</sup> May 2021

E-mail: [bioticapublications@gmail.com](mailto:bioticapublications@gmail.com)

#### How to cite this article?

Sehgal *et al.*, 2021. Key Pests of Okra and Their Eco-Friendly Management. *Biotica Research Today* 3(5): 348-350.

#### Abstract

Okra is an important vegetable crop grown throughout the year in India. The crop is attacked by a number of pests of which Melon thrips, leafhopper, whitefly, aphids, shoot, and fruit borer, okra fruit borer, red spider moth, damping off, wilt, powdery mildew, leaf spot, mosaic, leaf curl, and root-knot nematode are important. The productivity of okra in India is low due to yield losses caused by various pests and diseases. In this document, we have tried to focus on the key pests of okra and their management strategies.

#### Introduction

Okra, commonly known as ladyfinger, Bhendi, scientifically name, *Abelmoschus esculentus* belong to the family Malvaceae a crop of tropics and subtropics is one of the socio-economical important vegetables grown in almost agro-climatic zones situated Assam, Andhra Pradesh, Bihar, Gujarat, Karnataka, Odisha, Uttar Pradesh, and West Bengal, etc. It is an annual plant whose height is limited up to 2.1 meters and bears 12.5 to 30 cm pyramidal pods, a good source of various vitamins predominantly A and B, protein and various minerals, a good source of Iodine. In India during 2019-20, the total Horticulture production is about 320 million tonnes and vegetable production is about 192 million tonnes grown in about 10.35 million hectares. The yield varies with varieties and season of cultivation. The yield will vary from 7.5 to 22 t/ha. Several researchers are working on this crop but unable to find difficult to attain the yield, one of the reasons is this crop is attacked by about 100 pests. The key pest include Melon thrips, leafhopper, whitefly, aphids, shoot and fruit borer, okra fruit borer, red spider moth, damping off, wilt, powdery mildew, leaf spot, mosaic, leaf curl, and root-knot nematode. Due to excessive usages of pesticides as these pests and pesticides may be a limiting factor in the pathway of okra fruits export to European Union and other countries.

Regular weekly pest monitoring was suggested from the germination to harvesting stage by pest scout or farmers, either manually or with the help of pheromone, blue/ yellow sticky traps. Depending upon the economic threshold level the Integrated Pest Management (IPM) modules were developed, validated, and disseminated. The IPM tactics depend upon the correct identification. The correct identification is as follows.

#### Insects and Mites

1. **Melon Thrips, *Thrips palmi*** is a polyphagous pest and reported on various members of Cucurbitaceae and Solanaceae. The female laid singly inside the plant tissue which is colourless, and turns yellowish towards maturation, bean-shaped. The larvae and adult resembles except the

adults lacked wings and adult are pale yellow in colour with a number of dark setae. A dark black line is observed at the juncture of wings and runs along the back of the body. The antenna is seven segmented, red in colour and they usually feed on the mature/ old leaves.

**2. Leafhopper, *Amarasca biguttula***, adults are in yellow to green in colour which is about 3 mm long, wedge-shaped having black spots on each forewing and vertex. The eggs are laid in the cluster in the leaf vein, hose is yellowish in colour. The different stages feed on the lower side of the leaf.

**3. Whitefly, *Bemisia tabaci*** is one of the key pests causes huge losses to the crop. Their adults which are about 1.5 mm long are yellow in colour dusted with white waxy powder. The stalked eggs are either singly or groups beneath the leaves. The different stage of this insect sucks the leave sap.

**4. Shoot and fruit borer, *Earias vittela* and *E. insulana***. The adult of *E. vittela* is 2.5 cm and have a narrow light green band in the middle of forewings, such bands are not present in *E. insulana*. Larvae are about 2 cm long dull green in colour, having small bristles and a number of black spots on the body. The females lay the eggs sky blue colour eggs singly. These bores into shoots resulted in the dropping of fruits.

**5. Okra fruit borer, *Helicoverpa armigera*** is polyphagous which lays spherical yellow eggs singly on tender parts of plant. These eggs are flat at the bottom. Different colour of larvae was noticed with darker broken lines alongside of the body. The insect body was covered with radiating hairs and these pupate inside the soil. The adult body is medium-sized brownish forewings with a dark cross band near the outer margin and dark spots near coastal margins. The damaged fruits have circular irregular holes comparatively bigger in size. Half portions of larva remain inside the fruit while feeding.

**6. Aphids, *Aphis gossypii*** are small soft-bodied found in colonies inside the tender parts of the plant. The nymphs and adults suck the cell sap and caused damage. Honeydew sticky secreted by these aphids on the leaves developed black shooty mould.

**7. Red spider mite, *Tetranychus spp.*** These mites are tiny and have a different colour with two dark spots on the body. Their infestation observed during dry and warm conditions. Their damage is done by sucking cell sap, giving grey patches on leaves which later turn brown and finally pre-mature fall, in case of severe infestation webbing is observed.

## Diseases

**a) Damping Off, *Pythium sp.*, *Rhizoctonia sp.***: These diseases kill seedlings before or soon after their germination. Poor germination was noticed if infection occur pre emergence of seedlings and post emergence the seedlings either fall over or die which is commonly termed as damping off. The impact of diseases was fatal in cool, cloudy weather, wet soils and

other abiotic factors and initial inoculum. The seedlings that emerge develop a lesion and these lesions become soft as a result of which seedlings collapse.

**b) Fusarium Wilt, *Fusarium oxysporum f. sp. Vasinfectum***: All the varieties are found to be susceptible. This fungus survives long in the soil for long time and show temporary wilting symptoms and can become permanent and progressive. The wilted plant leaves are yellow in colour, and had turgidity, dropping symptoms. In mature plants, leaves are suddenly show wilting and their collar region turn yellow or brown. Finally the plant dies. This fungus can enter through root system and get multiplied in vascular region and blocked the water movement and finally plant will die.

**c) Powdery Mildew, *Erysiphe cichoracearum***: Powdery mildew is one the limiting disease which reduces the yield of crop due to foliage loss. This disease is reported on the mature leaves as well as on the stem. The infected plants have the symptoms like small, subtle, round whitish spots, which may enlarge and coalesce rapidly and white powder mass like a talcum powder was noticed on all the upper vegetative plant parts, which mainly contain spores. The severity of the disease is recorded due to more humidity. The highly infected plant parts turn yellow, dry, and finally brown. The spore can be easily blown and disseminate the disease. Premature defoliation was recorded.

**d) Cercospora Leaf Spot, *Cercospora abelmoschi* and *C. malayensis***: In the case of *C. malayensis* brown, irregular spots were noticed, whereas in case of *C. abelmoschi* sooty black angular spots were seen. The infected leaves rolls down and wilting may occur and finally, pre-mature leaf may fall. During the humid season the severity of disease was observed and pre-mature defoliation may occur.

**e) Yellow Vein Mosaic Virus (YVMV)**: The most destructive viral disease of okra, because it retarded the growth of crop and yield. The infestation may be recorded at all stages of the crop, it is transmitted by white. Homogenous interwoven network of yellow veins enclosing islands of green colour tissues resulted in a complete change of colour of leaves to yellow. There is the retardation of growth take place.

**f) Enation Leaf Curl of Okra**: This disease is transmitted by whitefly. The infected leaves are small, pinhead enations, later it turns warty and rough-textured. The characteristic symptoms are twisting of the main stem and lateral branches along with enations. Infected leaves and leaf petiole are twisted of leaf petiole is recorded, turns thick and leathery and newly formed leaves show enations, thickening, and curling. Fruits are also deformed.

**g) Root-Knot Nematode, *Meloidogyne incognita***: This nematode injury can involve above ground and below ground. Retardation of crop height, yellowing, wilting, leaf chlorosis, seems nutrient deficiency, whereas in the root there is the

formation of single or multiple gall formation.

### Management Tips

- Sow yellow vein resistant varieties.
- Seed treatment with *Trichoderma* @ 4 g per kg of seed.
- Sow jowar or maize crop around the main field as a barrier crop for adult moths of white fly and fruit borer.
- Spraying of NSKE (Azadirachtin-based) @ 5% 2-3 times a week interval for sucking pests.
- Plant yellow sticky traps/ delta traps @ 2 per acre.
- Red spider bug can be managed by spraying Dicofol 18.5 EC @ 2 ml per litre.
- For the convenience of predatory birds, installation of wooden bird perches @ 10 per acre in the field.
- Spraying Thiamethoxam 25 WG @ 500 litres of water at a rate of 100 ml/ha sucking pests. Second spraying should be done after two weeks, if needed.
- Removal and destruction of infected plants affected by

yellow vein rashes from the field.

- For the management of white spiders, spray 250 ml of phenopropashine 30 EC or 4 L per ha of oxidimeton methyl 25 EC (Murovhi *et al.*, 2020).
- Management of powdery ash, sprayed azadirachtin- based neem oil 0.03%.with 1000 litres of water @ 2-2.25 litres WP 3.13 kg per ha (Zobayer and Hasan, 2013).
- Apply broth @ 2 per acre to monitor the activation of the borer. Change the lure score of the noose every 15-20 days.
- Release of egg of *Trichogramma spp.* at the interval of 4–5 times per week at 1.0 lakh per ha. Leave in the field.
- If the number of shoots and fruit borers exceeds ETL (5.3 percent infection), the rate of emamectin benzoate 5 per cent (WDG) is 150 g per ha or chlorantraniliprole 18.5 SC, 425 ml. Spray with 500 litres of water (Kumar and Steffen, 2000).
- Removing and harvesting crop wastes from the field.
- To prevent whitefly in initial stage, use grey-black transparent mulches of 7-micron thickness.



a) Shoot and fruit borer



b) Melon Thrips



c) Leafhopper



d) Whitefly

Figure 1: Major insects



a) Damping Off



b) Fusarium Wilt



c) Powdery Mildew



d) YVMV

Figure 2: Major diseases

### Conclusion

To reduce pest infestation all the integrated management practices must be followed accordingly and in this way productivity can be maximized.

### References

Kumar, P., Steffen, J., 2000. Life cycle studies on fruit and shoot borer, *Leucinodes orbonalis* and natural enemies of insect pest of eggplant (*Solanum Melongena*). *J. Appl. Biol.* 10(2), 178-184.

Murovhi, J., Phophi, M.M., Mafongoya, P., 2020. Efficacy of Plant Materials in Controlling Aphids on Okra (*Abelmoschus esculentus* L. Moench) in Limpopo Province of South Africa. *Agronomy* 10(12), 1968. doi:10.3390/agronomy10121968.

Zobayer, N., Hasan, R., 2013. Effects of manually processed Bio-pesticides on crop production and pest managements in okra (*Abelmoschus Esculentus* (L.) Moench). *J. Nat. Sci. Res.* 3, 112–118.