AgriCos e-Newsletter
ISSN: 2582-7049
AgriCos e-Newsletter
Open Access Multidisciplinary Monthly Online Magazine
Volume: 04 Issue: 01 January 2023 Article No: 12

Integrated Pest Management Strategies for Okra, *Abelmoschus esculentus* (L.) Moench

Vinod Kumar Dubey[1], Sanjay Kumar Sahoo[2], B. Sujatha[1] and Sanhita Chowdhury[3]
[1]Ph.D. Research Scholar, [2]Associate Professor, [3]M.Sc. Research Scholar, Department of Entomology, Post Graduate College of Agriculture, Dr. Rajendra Prasad Central Agricultural University, Pusa, Samastipur, Bihar

SUMMARY

Okra is a high-fiber vegetable crops that also has numerous beneficial nutrients and therapeutic characteristics. Numerous insect pests affect the okra crop, causing serious economic losses. These insects' pest viz., shoot and fruit borer, whitefly, jassid, red cotton bug, and red spider mite. In order to manage these significant insect pests of okra, it is important to identify the damage symptoms, identification of pests, and suitable management measures.

INTRODUCTION

Okra, *Abelmoschus esculentus* (L.) Moench is economically most important vegetable crop, affected by many pests causing significant yield loss. In spite of regular spraying of insecticides, these pests cause 30 to 40 per cent yield losses in okra. To reduce the losses due to these insect pests, a large amount of pesticides is used by the okra growers. Because of the absence of an effective alternative method, they are over-dependent on chemicals for pest control that not only create environmental problems but also affect human health due to the presence of pesticide residue in the fruits. Best alternate to chemical based pest control is integrated pest management (IPM). IPM combines several ecologically safer pest control strategies for pest management that reduce the quantity of pesticides usage and thus solve the environmental as well as human health problems. IPM being a knowledge intensive approach, emphasizes appropriate decision-making and depends heavily on accurate and timely availability of information/knowledge for field implementation. More often, extension workers and farmers rely on plant protection experts for accessing pest management information/knowledge. Unfortunately, experts are not available for consultation at a point of time when they need them. Integrated Pest Management (IPM) strategies for okra is useful to manage these insect pests effectively.

Identification characters and damaging symptoms

The major key insect pests of okra are:

Leaf hopper, *Amrasca biguttula biguttula* Ishida: Nymphs and adults of *A. biguttula biguttula* appear as pale green in color and move diagonally. The leaves turn yellowish and curl in downward. If the infestation is severe, the leaves turn brick red in color and become crumble.

Shoot and fruit borer, *Earias vittella* and *E. insulana* (Fabricius): When the crop is young, larvae bore into tender shoots and tunnel downwards which wither, drop down and growing points are killed. In fruits, the larvae bore inside these and feed on inner tissues which become deformed in shape with no market value.

Aphids, *Aphis gossypii* (Glover): The wingless (apterous) parthenogenetic females are 1 to 2 mm in length. The body is quite variable in color: light green mottled with dark green is most common, but also occurring are whitish, yellow, pale green, and dark green forms. The cornicles also are black. Aphids feed on the underside of leaves, or on growing tip of vines, sucking nutrients from the plant. The foliage may become chlorotic and die prematurely. Their feeding also causes a great deal of distortion and leaf curling, hindering photosynthetic capacity of the plant.

Red cotton bug, *Dysdercus koenigii* Fab. Bugs are long, slender insects with white or light bands running the length of the abdomen. The insect is active all year long and spends the winter as an adult. Both nymph and adult insects eat the fruits, stems, and leaves of okra. Yellowing of the leaves and slowed plant development are the earliest effects of sap draining from the leaves and stem. However, in cases of severe infestation, the plant may become weak and fail to develop to its full reproductive capacity.

Red spider mite, *Tetranychus cinnabarinus* Boisduval: Larvae & nymphs are greenish red while adults are oval, reddish brown in colour. Mites feed on the under surface of leaves and the affected leaves gradually start curling and get wrinkled and crumpled.

Yellow vein mosaic disease: This disease, spread by whitefly, *Bemisia tabaci* (Gennadius) (Homoptera: Aleyrodidae) is economically most important disease. Interwoven network of yellow veins encompasses with islands of green tissues on leaves. Later, entire leaves turn yellow.

Pest Surveillance: Weekly monitoring through pest scouting and with the help of monitoring device like pheromone traps, colored sticky traps should be practiced from germination to harvesting stage. For field scouting 100 plants per acre in a cross diagonal pattern through zig zag manner is required to be observed for counting of each and every type of insects which may fall in the pathway of okra fruit export. If 95% plants found free from insect pests then the field should be considered fit for export of okra fruits.

Integrated Pest Management Strategies

Cultural control

- Sowing of Yellow Vein Mosaic Virus (YVMV) resistant hybrids *viz.*, Makhmali, Tulsi, Anupama-1 and Sun-40 etc. especially during *kharif* season of the crop.
- Grow maize/sorghum on borders as a barrier/trap crop for the entry of shoot & fruit borer adults.
- Rogue out the YVMV affected plants, if any, from time to time.
- Periodically remove and destroy the borer affected shoots and fruits.

Mechanical control

- Set up yellow sticky traps and delta traps for white fly etc.
- Erection of bird perches @ 10/acre in the field for facilitating bird predation.
- Install pheromone traps @ 2/ acre for monitoring of *Earias vittella* moth emergence and replace the lures after every 15- 20 days interval.

Biological control

- Release egg parasitoid *Trichogramma chilonis* @ 1-1.5 lakh/ ha starting from 30-35 days after sowing, 4-5 times at weekly interval for shoot & fruit borer.
- By using predacious hemipteran bugs like *Antilochus cocqueberti* Fabricius and *Harpactor costalis* Stal on which feeds on nymph and adults

Chemical control

- Shoot & fruit borer, if crosses ETL (5.3 % infestation), spray cypermethrin 25 EC @ 200 g a.i/ha.
- Give two to three sprays of NSKE @ 5% alternating with sprays of pesticides, if needed, for leaf hopper, white fly, mites and aphids etc. Leaf hopper, if crosses ETL (5 hoppers/plant), spray imidacloprid 17.8 SL @ 150 ml/ha. This will be effective in controlling other sucking pests as well.
- Need based application of chemical pesticides viz. imidacloprid 17.8 SL @ 150 ml/ha, cypermethrin 25 EC @ 200 g a.i/ha (0.005%), quinalphos 25 EC @ 0.05% or Propargite etc. 57 EC @ 0.1 % for control of leaf hoppers, aphids, white flies, borers and mites.

CONCLUSION

Okra is a vegetable crop that is particularly valuable due to its nutritional and therapeutic properties. The greatest okra producer in India is West Bengal, followed by Bihar. However, a variety of biotic and abiotic variables negatively impact okra yield. Insect pests are the most significant biotic component because they result in widespread infestation and lower economic yield. In order to control the pest below the economic threshold level, it is crucial to learn about the insect pest life cycle, damage symptoms, and management measures.

REFERENCES

Obeng-Ofori, D. and Sackey, J. (2003). Field evaluation of non-synthetic insecticides for the management of insect pests of okra Abelmoschus esculentus (L.) Moench in Ghana. *SINET: Ethiopian Journal of Science*, *26*(2): 145-150.

Murovhi, J., Phophi, M. M. and 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.

Sharma, R. and Peshin, R. (2016). Impact of integrated pest management of vegetables on pesticide use in subtropical Jammu, India. *Crop Protection*, *84*: 105-112.

Sabyasachi, P., Maji, T. B. and Palash, M. (2013). Incidence of insect pest on okra, Abelmoschus esculentus (L) Moench in red lateritic zone of West Bengal. *The Journal of Plant Protection Sciences*, *5*(1): 59-64.

Pathan, N. P. and Bharpoda, T. M. (2016). Succession of major insect pests in okra, Abelmoschus esculentus (L.) Moench grown in summer. *International Journal of Agricultural Science and Research*, *6*(4): 111-118.

Khuhro, S. A., Lanjar, A. G. and Solangi, A. W. (2014). Integrated pest management of insect pest population through different technique strategies in okra agro eco-system. *Integrated Pest Management*, *4*(8): 120-128.