

MAJOR INSECTS OF CUCURBITS AND THEIR MANAGEMENT WITH IPM MODULE

Purushotam Sharma

Department of Agricultural Entomology, S.K.N. College of Agriculture Jobner, Jaipur 303328

Email of corresponding author - purushotamsharma420@gmail.com

Cucurbits are attacked by several species of insect pests, among which fruit flies and pumpkin beetles are important.

1. Melon fruit fly – *Bactrocera (cucurbitae, ciliates, zonata)* (Diptera – Tephritidae)

Identification - Eggs: laid singly in clusters on fruits. **Larva:** dirty white apodous maggot.

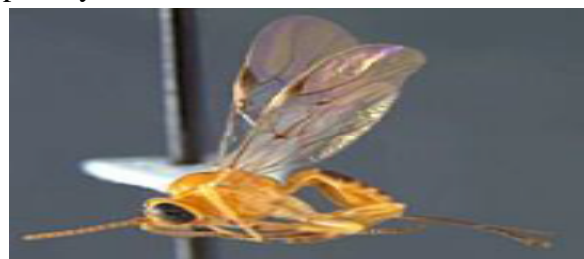
Pupa : pupate in soil.

Nature of damage – Only maggot causes damage by feeding on near ripe fruits, riddling them and polluting the pulp. The maggots are legless and appear as headless, 9 to 10 mm in size. The damage caused by this fruit fly is most serious in melons and after first shower of the monsoon, the infestation reaches 50 to 100 per cent.



Management – The regular removal and destruction of the infested fruits. Frequent racking of the soil under the vine or ploughing the infested field to expose pupa after the crop is harvested. In endemic areas, change the sowing date as the fly population is low in hot dry condition and at its peak during rainy season. Use ribbed gourd as trap crop and apply carbaryl 0.15% or malathion 0.1% on congregating adult flies on the under surface of leaves. Use attractants like citronella oil, eucalyptus oil, vinegar (acetic acid), and lactic acid to trap flies. Use poison baiting (Mix methyl eugenol+malathion 50 EC at 1:1 and keep 10 ml of bait in polythene bags @ 25/ha.) in several infestation. Use fly trap keep 5 g of wet fishmeal in polythene bags (20×15cm) with six holes (3mm dia.). Add 0.1 ml of dichlorvos (should be added every week and fishmeal renewed once in 20 days @ 5 traps/ha.

Natural enemies: Parasitoids: *Opius fletcheri* (pupal) Attractant plants: Permanent plantings for shelter (hedge rows): (assassin bug) Strips of rye, grains, cover crops and bio mulch beds (rove beetle) Nectar-pollen rich plants with small flowers i.e. anise, caraway, dill, parsley, mustard, sunflower, buckwheat and cowpea (braconid wasp).



2. Pumpkin beetle: *Aulacophora (foveicoilis, cincta, intermedia)* (coleopteran - chrysomelidae).

Identification and nature of damage – Freshly hatched dirty white, fully grown grub creamy yellow, red or blue in colour. Grubs feed on the roots, stem and fruits touching the soil. Adult feeds on leaf and flours. The early sown cucurbits are so severely damaged and they have to be resown.



Managements: Plough the fields just after harvesting destroy the hibernating adults. Collect and destroy adult beetles. Sow the crop in November to avoid damage by this pest. Spray malathion 50 EC @500 ml or dimethoate 30EC@500 ml or methyl demeton 25EC@500 ml/ha, apply 7 Kg carbofuran 3G per ha. 3-4 cm deep in the soil near the base of the plant just after germination and irrigate.

Natural enemies: Parasitoids: *Celatoria setosa* (grub) **Predators:** Pennsylvania leather wing beetle (*Chauliognathus pensylvanicus*) **Nematodes:** *Steinernema riobravis*



Nematode

Pennsylvania beetle

Braconid wasp

Celatoria setosa

3. Semilooper: *Plusia orichalcea* (Lepidoptera – Noctuidae)

Nature of damage: Damage cucurbits by biting holes on leaves.

Managements: clean cultivation collection and destruction of caterpillars, need based spray of endosulfan or carbaryl.

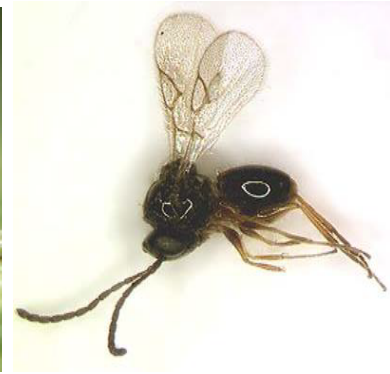
4. Serpentine leaf miner: *Liriomyza trifoli* (Diptera – Agromyzidae)

Nature of damage: Leaves with serpentine mines, drying dropping of leaves in severe cases



Management: Control with insecticides is difficult. Systemic materials may be required to control larvae within the leaf tissue. Destruction of crop residues from earlier infested plantings may reduce problems in later plantings. Maintain vigorous plant growth through proper fertilization and watering. Leafminers are controlled in large part (75%) by several species of parasitoid wasps. Avoiding the use of broad-spectrum insecticides for other pests will help preserve these natural enemies.

Natural enemies: Parasitoids:



1. *Chrysocharis pentheus*

2. *Diglyphus isaea*

3. *Gronotoma micromopha*

Predators:



1. Lacewing

2. Lady beetle

3. Spider

4. Fire ant

IPM Module: Deep ploughing is to be done on bright sunny days during the months of May and June. The field should be kept exposed to sun light at least for 2-3 weeks. Adopt crop rotation. Grow only recommended varieties. Sow early in the season. Always treat the seeds with approved chemicals/bio products for the control of seed borne diseases/pests. Sow in rows at optimum depths under proper moisture conditions for better establishment. Apply only recommended herbicides at recommended dose, proper time, as appropriate spray solution with standard equipment along with flat fan or flat jet nozzles. Maintain optimum and healthy crop stand which would be capable of competing with weeds at a critical stage of crop weed competition. Use NPK fertilizers as per the soil test recommendation. Use micronutrient mixture after sowing based test recommendations. Install pheromone traps at appropriate period. Release parasitoids only after noticing adult moth catches in the pheromone trap or as pheromone trap or as per field observation. Apply HaNPV or SINPV at recommended dose when a large number of egg masses and early instar larvae are noticed. Apply NPV only in the evening hours after 5 pm. In case of pests which are active during night like *Spodoptera* spray recommended biocides/ chemicals at the time of their appearance in the night. Spray pesticides thoroughly to treat the undersurface of the leaves, particularly for mites, whiteflies, *Spodoptera* etc. Apply short persistent pesticides to avoid pesticide residue in the soil and produce. Follow the recommended procedure of trap crop technology.

References

<http://www.agritech.tnau.ac.in>

NHM manual for post harvest management and integrated pest management:

<http://www.nhm.nic.in>

AVRDC the world vegetable center: <http://www.avrdc.org>

FAO Regional Vegetable IPM Programme in South & Southeast Asia:

<http://www.vegetableipmasia.org/CropsSites.html>

Indian Institute of Horticultural Research: <http://www.iihr.ernet.in>

Acharya N. G. Agricultural University, Hyderabad: <http://www.angrau.ac.in>

University of Agricultural Sciences, Dharwad: <http://www.uasd.edu>

Jawaharlal Nehru Krishi Viswa Vidyalaya, Jabalpur: <http://www.jnkvv.nic.in>

Punjab Agricultural University, Ludhiana: <http://www.pau.edu>

http://www.nbaii.res.in/Featured%20insects/Henosepilachna_vigintioctopunctata.htm

<http://www.cabdirect.org/abstracts/19931178576.html;jsessionid=75422544D06F177181B90>

[F2E4D11035F?freeview=true](http://www.cabdirect.org/abstracts/19931178576.html;jsessionid=75422544D06F177181B90)

[http://www.ncipm.org.in/mealybugs/BulletinMealybugs%20\(English\).pdf](http://www.ncipm.org.in/mealybugs/BulletinMealybugs%20(English).pdf)

http://www.ikisan.com/Crop%20Specific/Eng/links/ap_brinjalInsect%20Management.shtml

<http://www.cabi.org>