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Monitoring and Management of Fruitfly in Pumpkin

Preeti Yadav[1*], Shubham[2]

[1]Department of Vegetable Science, CCS Haryana Agricultural University, Hisar-125004
[2] Department of Vegetable Science, Maharana Pratap Horticulture University, Karnal-132001

*Corresponding Author
Preeti Yadav*

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INTRODUCTION

Fruit flies are one of the major pests of Pumpkin causing major economic losses. Fruit fly damage starts from March and ends in August or September. Female flies lay eggs inside thefruit that is fruit initiation and development period. It causes up to 50-60 % yield loss in pumpkin.

How to identify insect damage:

Adult fruit fly attacks young and older stages of fruit. Infested fruits usually show a 'sting' mark. Pin-sized holes, which look like small spots, anywhere on the fruit can be seen on fruitfly attack indicating that the eggs have been laid by the female adult into the fruit. The maggots from the larvae start feeding on the fruit. When fruit is cut open decay of fruit flesh can be seen as a sign of infestation. Fruit will fall from the tree due to larval infestation. Maggots are found in infected fruits, which means the fruits cannot be eaten.

When to start control measures:

To monitor fruit fly in the filed traps can be installed and number of insects trapped are regularlychecked. To prepare a trap make 10 to 12 holes into an old plastic bottle to allow flies to enter.Put a wire from the cover to suspend the bait as pumpkin pulp and jaggery. Half-fill the trap with soapy water. Attach the trap to a bamboo or wooden stake or hang on branch of a tree. Place traps at least 3 meters apart. 2-3 traps are enough for 1 ha field. Change the bait once in 15-20 days. Flush out the trapped insects periodically. When number of fruit fly exceeds 1 per day in each trap control measures should be taken.

Management of fruit fly:

Although the damage is done by maggot and adult of fruit fly during fruiting stage, pupa remains in the soil and adults live on alternate host throughout the plant cycle. Hence control measures should begin from crop initiation itself. Use of any one chemical or any single method will be less effective. Therefore, different practices are to be taken to effectively control fruit fly. Not all the practices but any combination of following operations can be done at different crop stage according to availability of material and feasibility.

Cultural Control

These include cultivation practices from the crop sowing to avoid fruit fly population development. It includes following steps:

- Field sanitation by destroying all damaged fruits and disposal of crop wastes away from the field. Infested fruit should be buried 3 feet under soil surface. Addition of lime is helpful tokill emerging larvae.
- Planting ridge gourd as trap crop in the borders of the field
- Deep ploughing field in summer that exposes the pupa in soil to sun and kill them
- Slight raking of the soil during fruit development
- Harvest only fully matured fruit
- Do not grow pumpkin in the field in which crops like cucumber, bottle gourd, bitter gourd and melons are not grown

Physical control:

- Fruit fly plastic bottle water traps as done for monitoring should be installed in the field using baits. These bait traps should be kept in the field before flowering
- Mix pumpkin fruit pulp of 1kg, 100 ml cow urine, 0.5 litre of water, 1kg pumpkin and & 100 gm of jaggery and 10 ml malathion. All materials mixed well and allowed to stand overnight to ferment. For ready-to-use bait, mixture is diluted with 15 litres of water. This bait is kept in 7-9 places at 3 m height using bamboo or plastic pole in a dispenser made of plastic bottle. This solution can also be sprayed to the plants
- If possible immature fruits should be covered with polyethylene bag or newspaper

Biological control:

- Conserve pupal parasitoids viz. *Opius. piusfletcheri*, *O.compensatus*, and *O. insisus*. Encourage activity of *Apanteles plusia* and *A. taragamae* in the field. These are insects that kill the fruit fly larva and pupa
- Applying fresh Neem oil at 2 ml per litre to soil to kill pupa before planting
- Use attractants like citronella oil, eucalyptus oil, vinegar (acetic acid) and lactic acid to trap flies
- Spray of neem seed kernel extract at 5% at least 3 times with 10-15 days interval
- Apply neem cake at 250 kg/ha immediately after germination to soil and repeat after flowering followed by sprays of neem soap at 1% 2 times at 10 days interval after flowering.

Chemical control:

- Treat root zone soil of plants with Folidot dust (Malathion 5% Dust) at 20 kg/ha to kill pupa
- Para-pheromones traps: Use of synthetic sex pheromone cuelure, Methyl eugenol is found effective. These are built in the same way as monitoring traps but the lure is used in place of bait. 3-4 traps/acre of methyl eugenol or 2-3 traps/acre of cuelure is sufficient for mass trapping insect
- Mix Fenton (methyl eugenol) + Jaithion (malathion 50 EC) at 1:1 ratio and keep 10 ml of the bait in polythene bags @ 25/ha
- Apply Sevin (carbaryl) 0.15% or Jaithion (malathion) 0.1ml /ltr on the under surface of leaves When chemicals are sprayed harvest after minimum of 7-10 days of spraying.