

Cost Effective Management Strategies for Fruit Flies in Mango and Guava

Fruit flies are of great economic importance as majority of them cause extensive damage to many fruits and vegetables throughout the tropical and subtropical world. Female fruit flies lay eggs in fruits and ruin more than 400 different fruits and vegetables including mango, guava, citrus, papaya, peach, passion fruit, plum, apple and several cucurbitaceous vegetables etc. India is the second largest producer of fruits in the world with an annual production of 43 million tons from an area of four million hectares and contributes to more than nine per cent of world's fruit production. Mango (*Mangifera indica*

Linn.) accounts for 38 per cent of the area and 23 per cent of all the fruits in the country. Fruit flies belong to the family Tephritidae which is one of the largest, most diversified and fascinating acalypterate families of Diptera. Tephritidae includes about 4000 species of 500 genera. These are commonly called as "fruit flies" due to their close association with fruits and vegetables. Out of 4000 species, 392 species have been recorded in India.

They are considered as high priority quarantine pests.

Because of their infestations, India has been included in the list of those countries from where fruit import to developed countries is banned. In India, a total loss of 2,558 and 26,902 million rupees was estimated due to fruit flies with and without control measures, respectively.

Mango and guava fruit flies, *Bactrocera dorsalis* (Hendel) is a serious destructive pest which deposit their eggs on host fruits when they are physiologically ripe. On hatching, maggots bore their way to the interior and feed on the pulp. Area fed by the maggot is discoloured due to rotting of the fruit and the fruit drops prematurely. Being polyphagous pests with high reproductive potential, wide host range, adaptability to climate and overlapping of generations, therefore its management is rather difficult.

Present management strategies mostly focus on insecticides. Due to cryptic nature of the larvae of fruit flies they mostly remain unaffected by such insecticides, vis-à-vis the chance of insecticide residues in the fruits also increase.

Among the various alternate strategies available for the management of fruit flies, the use of methyl eugenol traps stands as the most outstanding alternative. Methyl eugenol has both olfactory as well as phagostimulatory action and is known to attract fruit flies from a distance of 800 m. Methyl eugenol, when used together with an insecticide impregnated into a suitable substrate, forms the basis of male annihilation technique. This technique has been successfully used for the eradication and control of several *Bactrocera* species.

Advantages:

1. They can provide effective and high level protection.
2. They will not harm human or any other non-target organism.
3. No residues and resistance problem as like in case of insecticide spraying.
4. They can be manufactured even in small scale industry due to less expenditure.
5. Increasing knowledge on behaviour associated with attraction of both sexually immature females and egg laying females would improve detection and delimitation of fruit flies and provide increased protection of crops.
6. They can be used for mass trapping.
7. They just act as a cue for misguiding insect.
8. They never disrupt the ecosystem.
9. There will be no phytotoxic effect on plants.