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Management of Fruit fly in Guava

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INTRODUCTION

Guava, *Psidium guajava* L., is considered a native to Mexico and grows in all the tropical and subtropical areas of the world. The area under guava is about 0.15 million hectare, producing 1.80 million tonnes of fruit. Bihar is the leading state in guava production followed by Andhra Pradesh and Uttar Pradesh. Guava is popular due to its rich nutritional and medicinal value, affordable price, suitability for transportation, handling and consumer preference. Guava-growing areas under tropical and subtropical regions are expanding due to its high demand for fresh fruits and processed products in global trade, but fruit flies are the major limiting factor in successful cultivation of this fruit. Fruit flies are the most serious and destructive pest species of global importance that causes direct damage to the fruits and thereby reducing the yields. Their attack not only reduces yield but also degrades the quality of the fruit, rendering it unfit for human consumption. It causes significant economic losses by lowering the market value of fruits and, as a result, diminishing farmer's revenues. The total estimated losses caused by these fruit flies are up to 27-42% and in severe cases, it may reach upto 90% in mango, while upto 90% losses have been reported in guava. Several fruit flies species are known to affect wide variety of horticultural crops across the globe. The most common species known to attack guava's are *Bactrocera cucurbitae, B. correcta, B. dorsalis and B. zonata*. During August to October, two important fruit flies, Bactrocera dorsalis and Bactrocera zonata may destroy 100 per cent fruits of guava.

Life cycle and Nature of damage

Female fruit flies lay eggs under the skin of host fruits. The egg development completes in 2 days, but depending on the prevailing temperature, it may vary. Maggots that emerge from the eggs make tunnel and feed on the pulp; maggots undergo two moulting, drop from the fruit and enter into the soil for pupation. The pupal period completes in 7–18 days. The adult females sexually mature in 16–38 days. Fruit flies complete many generation in a year.

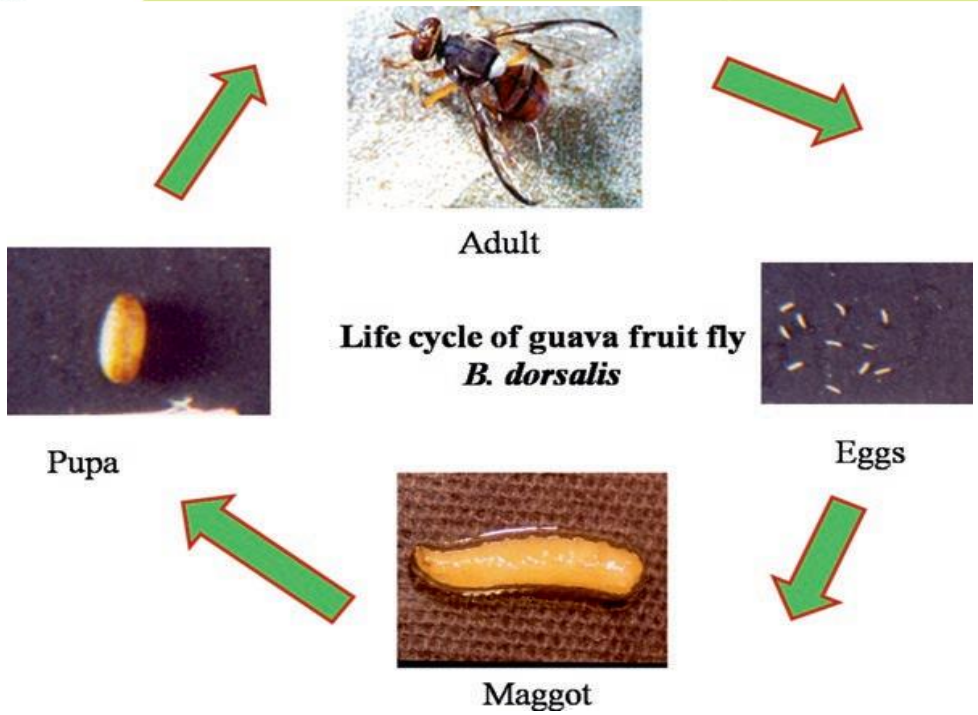

Fig 1. Life cycle of guava fruit fly *B. dorsalis*

The fruit skin is injured, secondary infection starts on the fruit, and ultimately fruit starts to decay. The maggot that emerges from the egg feed on the decaying fruit tissue, on which yeasts and bacteria multiply. The damaged part of the fruit becomes soft at the place of larval feeding and later on leads to putrification, and subsequently fruit drop occur.

Fig 2. Damage of fruit fly on guava fruits

Management strategies

- Early harvesting of mature fruits. As this stage of fruit maturity, crops are not susceptible to fruit fly attack.
- Collect and dispose all infested fruits on trees and fallen fruits on the ground every alternate day and bury in trench.
- Removal of all wild trees in the orchards that might serve as a breeding ground for pests.
- Ploughing the top soil to a depth of 10 cm to expose the pupae to sunlight and killing them, preventing the infestation from spreading.
- **Bagging technique for rainy season fruits** -Good quality mature green hard fruits of rainy season guava can be produced by covering with white non-woven bags at the end of June to middle of July. Harvesting the bagged fruits at colour break stage. It also improves the fruit size and quality. On tree, 42 fruit bagging protect the fruits from fruit fly attack and eliminates the use of pesticide as recommended by Punjab Agricultural University (PAU), Ludhiana.
- **Fruit fly traps-** Fix PAU fruit fly traps @ 16 traps/acre in first week of July in Guava. The traps should be kept in these fruit crops till the fruit harvesting is over. Traps should be fastened to the trees using metallic wires/tags, at a height of 1-1.5 metre from ground level, depending upon the height of fruit tree, at a place receiving no direct sunlight. Recharge the traps if required (with appearance of fresh damage on fruits).
- **Bait Sprays-** During the adult fruit fly emergence, applying bait (feeding stimulant + insecticide) on the host tree was found effective in controlling the fruit fly population. Spraying of 5% neem oil has been found effective in reduction rate of egg laying by B. zonata on guava.
- Male annihilation technique (MAT) was found very effective for effective fruit fly management. This technique consists of different types of traps with para-pheromone methyl eugenol (male fly attractant) along with different insecticides and is in use throughout the country. In some cases this technique also helped in complete eradication of fruit flies.

Summary

Fruit fly infestation is the major concern in guava production in tropical and sub-tropical regions of the country. The adult flies infest by puncturing the surface of the mature fruits and lay the eggs that hatch into maggots. These maggots feed on flash of fruits thus make them unmarketable and unfit for human consumption. Depending upon the intensity of infestation, damage to fruits could be as high as 90%. Hence, the integrated pest management strategies of fruit flies in mango should be promoted which involves orchard sanitation, use of methyl-eugenol traps, application of neem based oil sprays, protein bait spray, a male annihilation technique (MAT) with methyl-eugenol traps to kill males, need-based insecticidal cover sprays and integrated practices during fruit maturity.

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