

Bio-Rational Management of Fruit Fly (Tephritidae) Using Pheromone Traps

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Tephritids are among the most studied group of fruit flies with ~ 4,000 well known species which are distributed worldwide. Out of these 200 species are economically important as they spoiling not only to fruits but also to a number of vegetable crops. In India, eight species of genus *Bactrocera* are identified among quarantine pests with the oriental fruit fly *B. dorsalis* Hendel being the most destructive fruit fly of mango, followed by Peach fruit fly *B. zonata* Saunders and Guava fruit fly *B. correcta* Bezzi. The

flies attack fruits at different stages of maturity but damage is more obvious at harvest period (Ansari *et al.*, 2012).

Due to the increasing concern of damage done by tephritids fruit flies, local area management at field or crop or village level is important to keep the population of fruit flies under

control. Under this management option, a number of methods such as bagging of fruits, field sanitation, protein baits and cue-lure traps, host plant resistance, biological control, and safer insecticides, can be employed to keep the pest population below the economic threshold in a particular crop over a period of time to avoid the crop losses without health

and environmental hazards, which is the immediate concern of the farmers.

Identification of pest

Creamish yellow apodous maggots with a black tooth-like feeding mouthpart (Fig. 1A). Pupa – ranges in color from dull red or brownish yellow. Adult – Reddish brown with transparent wing and with prominent yellow and dark brown to black markings on the thorax (Fig. 1B & C).



Fig. 1. (A) Creamish yellow apodous maggots of fruit fly on rotted fruit of mango, (B) Fruit fly ovipositing and puncturing the fruit skin, laying eggs, (C) Newly emerged fruit fly adults from laboratory, (D & E) Scientist (Dr. Archana Singh) preparing Methyl Eugenol based fruit fly traps as device to early monitor the population and (F) Scientist (Dr. Fazil Hasan) hanging the fruit fly traps 7 feet above the ground level.

Nature of Damage

Sting marks and bruising to the fruit skin constitute the external damage that later turn to brownish rotten patches (Bana *et al.*, 2015). Injury to fruit occurs through oviposition punctures by females and subsequent larval tunneling (Fig. 1B). Ripening fruits are more likely to be attacked.

Bionomics of pest

Females lay clusters of 6–10 eggs just under the skin of the fruit. After 1–2 days larvae hatch from the eggs and take 6–8 days to mature. Larvae feed upon the pulp of fruit. The mature larva emerges from the fruit, drops to the ground (5–10 cm), and forms a tan to dark brown puparium (Dhillon *et al.*, 2005). Flies start emerging from April onwards with maximum population during May to July which coincides with fruit maturity. About nine days are required for attainment of sexual maturity after the adult fly emerges.

Management practices

Affected fruits should be collected and destroyed. Rake up the soil below the tree and drench with chlorpyrifos 20 EC @ 2.5 ml/ L. Setting up of methyl eugenol traps to lure the males in the orchard @ 10/Ha (Fig. 1.10D, E & F). Cue-lure traps have been used for monitoring and mass trapping of the fruit flies. A number of commercially produced attractants (Flycide® with 85% cue-lure content; Eugelure® 20%; Eugelure® 8%; Cue-lure® 85% + naled; Cue-lure® 85% + diazinon; Cue-lure® 95% + naled) are available in the market, and have been found to be effective in

controlling this pest. Hasan *et al.*, 2023 (Unpublished) have captured 4.25 to 7.85 flies per trap per day in poison bait traps containing methyl eugenol + melathion in mango orchard during May and June, 2023 at Amroha region of U.P. India. Similarly, the same practice was done at the mango production belt of Gr. Noida U.P. where average fruit flies catch per traps was 3.28 to 6.67 (Hasan *et al.*, 2023 Unpublished) (Fig 1D-F). More over local area management of fruit fly was initiated by Dr. Hasan at the premises of Noida International University, Gr. Noida. In this method mass trapping of fruit fly was done by using commercially available cue-lure soaked in wooden board. These pheromone soaked wooden board was fixed in waste plastic bottles, walls of which having exit holes allowing moaning fruit flies to enter inside the bottle and trapped (Fig. 2A – 2D). Mau *et al.* (2003) reported that the use of male lure cearlure B1 (Ethylcis-5-Iodo-trans-2 methylcyclohexane-1- carboxylate) have been found to be 4 - 9 times more potent than trimedlure for attracting medfly, *C. capitata* males and thus could be tried for male annihilation strategies of melon fruit fly areawide control programs.

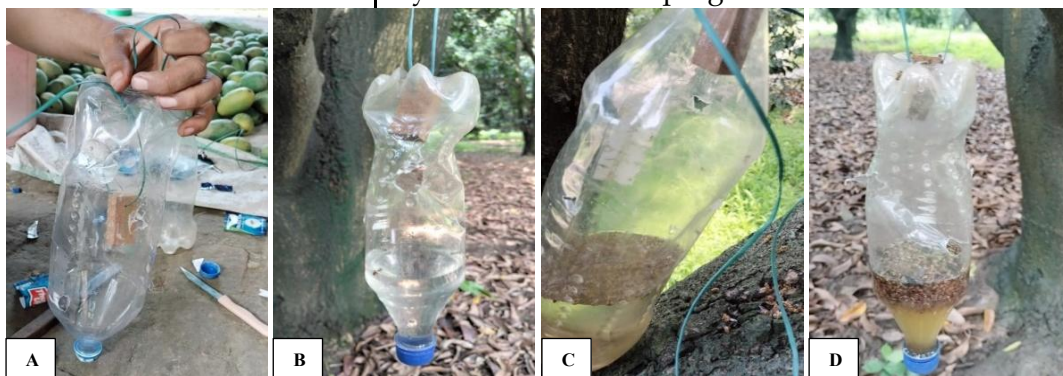


Fig. 2. Local area management of fruit flies using commercially available fruit fly traps.

References

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