

A guide to prepare Cue-Lure for *Bactrocera cucurbitae* (Coquillett) management in cucurbits

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Varanasi (Uttar Pradesh, India) considered to be one of the most prominent vegetable belts of the country (Roy *et al.*, 2017). Among the vegetables cultivate here, cucurbits (Fig.1) cover the major share in area and production. Among pest and disease complexes infesting cucurbits, majority of damage is caused by fruit fly complex (Bhowmik and Saha, 2017). Melon fruit fly *Bactrocera cucurbitae* (Coquillett) (Tephritidae: Diptera) reported to damage 81 host plants (Shivangi and Swami, 2017) and it considered to be the most serious one. It can cause a yield loss of about 30-100% in cucurbitaceous vegetables depending upon the season and other factors (Dhillon *et al.*, 2005).



Fig. 1. Cucurbit crops grown in Varanasi, Uttar Pradesh. (a) & (b) Sponge gourd (c) Bitter gourd (d) Bottle gourd (e) Round gourd (f) Ridge gourd

Damage symptoms of *B. cucurbitae*

Adult females lay eggs in soft and tender fruits by puncturing fruit skin with their sharp ovipositor. Infested fruits show brown resinous deposit in the oviposit area, maggots on hatching feed on internal pulp content of the fruit. Damaged fruits also fall off rapidly due to secondary infection by bacteria and fungi. Fruits drop prematurely which are also unfit for consumption. Along with above distorted and malformed fruits are also observed (Fig. 2).

Life cycle of *B. cucurbitae*

Adult female lays eggs in soft and tender fruit tissue. The eggs hatch into maggots in 2-5 days and larval duration ranges from 2-5 days. Matured larvae undergo pupation in soil at a depth of 0.5-15cm. Pupal period ranges from 9-13 days and adult longevity ranges from 13-15 days.

Management of fruit fly, *B. cucurbitae* using pheromone traps

Fruit flies on small and large scale can be managed by pheromone traps. Parapheromones are synthetically



Fig. 2. Fruit fly damaging symptoms in cucurbit crops. (a) Bitter gourd (b) Sponge gourd



Fig. 3. Preparation of cue-lure baited trap with insecticide. (a) Chemicals used for making cue-lure traps (b) Preparation of lure (c) Plywood pieces dipped in cue-lure (d) Dipped plywood pieces covered with aluminum foil.

produced chemical compounds, that have pheromone like action similar to female insect sex pheromones which is released to attract males. The Cue-Lure is a parapheromone which attract males of *B. cucurbitae* (Shelly *et al.*, 2004). The Cue-Lure can be used for monitoring and mass trapping of male flies and baiting with pesticide will helps to kill them immediately.

Preparation of Cue-Lure baited traps

Mix ethyl alcohol, Cue-Lure [4-(p-acetoxyphenyl)-2-butanone] and Malathion 50EC (Insecticide) in the ratio of 6:4:2 in a glass container. Add plywood pieces of size $2'' \times 2'' \times 1''$ ($l \times b \times h$) into above prepared mixture. Soak the plywood pieces in the Cue-Lure for 24-48 hrs (Fig. 3).

Preparation of low-cost trap bottles

Use transparent water bottle. Turn it upside down and make 2 window holes of $3'' \times 1''$ ($l \times b$) from the top $1/3^{\text{rd}}$ of the bottle. Tie the Cue-lure treated wooden blocks in the upper portion of bottle with thread or wire (Fig. 4).



Fig. 4. Installation of cue-lure baited traps in cucurbits field. (a) & (b) Installing low cost trap bottle, 1-2 m above the ground (c) & (d) Installed cue-lure traps in the field.

Usage and recommendation of Cue-Lure

Ten to twelve lure traps per acre are recommended. Traps must be placed from onset of flowering to harvesting (for wide area management) or throughout the year (for monitoring). Change lures in every 30-40 days and examine traps in every 15 days (Fig.



Fig. 5. Male & *B. cucurbitae* flies collected in Cue-lure bait traps.

5). Unscrew the bottle cap to collect and discard the collected fruit flies safely.

Caution: Always wear mask and gloves while preparing the Cue-lure and their installation in field to get protection from pesticide. Mix the ethyl alcohol, Cue- Lure and insecticide with a thick stick, wash it properly and discard safely.

Acknowledgements

Authors greatly acknowledge the head of the department for providing facilities to conduct research.

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