



Field evaluation of roosting plants with food bait spray in managing melon fly, *Zeugodacus cucurbitae* in cucumber, *Cucumis sativus*

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ABSTRACT

Melon fly, *Zeugodacus cucurbitae* (Diptera: Tephritidae) (Coquillett) is the major pest of cucumber, *Cucumis sativus*. We investigated the attractiveness of roosting plants with food bait spray to manage melon fly in cucumber under open field conditions. Cucumber was planted over two successive *Kharif* seasons together with maize (*Zea mays*), castor bean (*Ricinus communis*), sorghum (*Sorghum bicolor*), and Napier grass (Hybrid Co-3) as border plants. Border plants were sprayed weekly with an azadirachtin based food bait. The study revealed that castor bean was the most attractive roosting plant to melon fly followed by maize, sorghum, and Napier grass. The adult melon flies preferred to roost on the lower sides of the maize, sorghum, and Napier grass leaves and on the stems of castor bean. There were significant differences in the per cent fruit infestation of cucumber in all roosting host treatments except Napier grass compared to the control, with the lowest fruit infestation of 11.75% recorded in castor bean treatment. The highest cucumber yield 17.90 t/ha and the highest number of cucumber harvests 13.75 per season were observed in the castor bean treatment. Establishment of preferred roosting hosts could improve the bait application technique.

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1. Introduction

The melon fly, *Zeugodacus cucurbitae* (Coquillett) (Diptera: Tephritidae), is a very serious and economically important insect pest of cucurbitaceous crops and widely distributed in temperate, tropical, and subtropical regions of the world (Dhillon et al. 2005; Virgilio et al. 2010). The polyphagous melon fly damages 136 plant species from 62 plant genera and 30 plant families (McQuate et al. 2017) resulting into significant yield loss ranging from 30% to 100% (Dhillon et al. 2005). The melon fly is a major pest of many cucurbitaceous crops in India with Cucumber (*Cucumis sativus* L.; Cucurbitales: Cucurbitaceae) being one of its most preferred hosts. The adult females lay their eggs in soft and tender fruits. After hatching, the maggots bore into the fruit and feed on the inner content of the fruit causing severe yield loss and also affect the quality of cucumber reducing the marketability of the crop (Mir et al. 2014). When left unattended they can cause up to 100% loss (Dhillon et al. 2005). Melon fly damage is the major limiting factor in obtaining good quality fruits and high yield in cucumber. Hence, the prevention of yield losses due to melon fly damage is of paramount importance. In the current situation, the rampant use of chemical

insecticides has been able to manage this pest, but sole reliance on an array of chemicals has to lead to several problems associated with pesticide residues affecting human health and the environment. Further, injudicious use of chemical pesticides has lead to the development of resistance, harmful effects on non-targets, and other ecological disturbances (Singh and Singh 1998). Adult melon flies have a special behaviour of sheltering and roosting in non-host plants bordering host crops. Such plants are known as roosting crops. Through the bio-ecological approach, melon flies can be managed based on the behavioural response and also minimise the hazardous impact of chemical pesticide on the main crop as well as land area. If the border crops are non-attractive to melon flies, spraying the roosting plants with food bait seems inefficient. Hence, the preferred/attractive roosting crops serve as a point of localisation for the bait spray. Some of the earlier reports revealed that preferred roosting crops for *Z. cucurbitae* are castor bean (*Ricinus communis* L.), spiny amaranth (*Amaranthus spinosus* L.), corn (*Zea mays* L.), cassava (*Manihot esculenta* Crantz), guava (*Psidium guajava* L.), tiger's claw (*Erythrina tahitensis* Nadeaud), fuzzy rattlespod (*Crotalaria incana* L.), pigeon pea (*Cajanus cajan*), and citrus varieties (Nishida and Bess 1957; Kazi 1976; McQuate et al.