



Efficacy of a non-pheromone semiochemical for trapping of western flower thrips in the presence of competing plant volatiles in a nectarine orchard

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Abstract

Non-pheromone semiochemicals or allelochemicals (kairomones, synomones, allomones) are often derived from, or are similar to, host plant odours and depending on their use, these semiochemicals may have to compete with the same or similar odours emanating from adjacent host plants with unknown consequences on trapping efficacy. The aim of this study was to examine the efficacy of the non-pheromone thrips attractant methyl isonicotinate (MI) as a lure for Western flower thrips (WFT; *Frankliniella occidentalis*) over a range of *Prunus persicae* nectarine plant growth stages (flowering, green fruit, ripe fruit), when competition from different host plant odours may vary, and different numbers of thrips can be present, in a Catalan nectarine orchard in 2014 and 2015. Significant 2.4–3.9 × increases in WFT numbers in traps with MI compared with those without MI were consistent over the season (flowering, green fruit, mature fruit) despite overall differences in thrips numbers on these different occasions. These results suggest that MI is an effective lure throughout the nectarine growth stages despite the presumed presence of competing and changing host plant odours. Trap type and colour and MI release rate may be important for improving overall trap efficacy.

Additional keywords: Thysanoptera; trapping efficacy; attractant; methyl isonicotinate; competing odours, *Prunus persicae*.

Abbreviations used: HGLM (hierarchical generalized linear model); MI (methyl isonicotinate); NZFT (New Zealand flower thrips); WFT (Western flower thrips).

Authors' contributions: Conceived of the experiment: DT, JR, CC. Designed experiment: JR, CC, DB, MD, MN. Undertook field samples and compiled data: DB. Analysed the data: RB, DT. Wrote the paper: DT, CC, JR, MD, MN. All authors read and approved the final manuscript.

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Competing interests: DT, MD and MN all work for the New Zealand Institute for Plant and Food Research who hold the patent for MI.

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Introduction

Semiochemicals (pheromone and non-pheromones) are increasingly used in insect pest management (Suckling, 2015). Non-pheromone semiochemicals or allelochemicals (kairomones, synomones, allomones) are often derived from, or are similar to, host plant odours (Koschier, 2008) and depending on their use, these semiochemicals may have to compete with the

same or similar odours emanating from adjacent host plants with unknown consequences on trapping efficacy.

Frankliniella occidentalis (Pergande), western flower thrips (WFT), is a cosmopolitan pest of many different fruit and vegetable crops (Kirk & Terry, 2003). Since its dispersal around the world in the 1980s and 1990s it has become the principal thrips pests in peach and nectarine (*Prunus persicae*) in many countries (Lacasa *et al.*, 1993; González *et al.*, 1994; Felland

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