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Abstract

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Interactions between pesticides and predatory mites and their effects on the integrated control of *Brevipalpus yothersi* in citrus*

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Brevipalpus yothersi Baker (Acari: Tenuipalpidae) is an important mite species inhabiting citrus crops. This mite is the vector of Citrus leprosis virus (CiLV), which causes leprosis disease. Synthetic acaricides are the main management tactic used by citrus growers to reduce vector populations and mitigate the spread of the disease in orchards. However, most registered acaricides have low efficacy in controlling *B. yothersi*, mainly due to acquired acaricide resistance and antagonistic effects of insecticides on acaricides. Using predatory mites that occur naturally in citrus could be an alternative for managing this pest. *Amblyseius largoensis* (Muma) (Acari: Phytoseiidae) is a cosmopolitan species and a common predator inhabiting Florida citrus orchards and other fruit crops. It has been reported as an efficient biological control agent of the citrus leprosis mite. For the success of Integrated Pest Management (IPM), it is imperative to determine the selectivity of pesticides to predatory mites and the effects of different routes of exposure to the pesticide (i.e. ingested or contact). In addition to acaricides, insecticides can also cause adverse effects on both predatory mites and *B. yothersi*. We studied the impact of conventional acaricides (abamectin, cyflumetofen, spirodiclofen, fenpyroximate) and insecticides (phosmet, imidacloprid, zeta-cypermethrin), at maximum label rates, on *A. largoensis* and *B. yothersi* adults. Pesticide efficacy was evaluated up to five days after application. All of the acaricides were efficient in controlling *B. yothersi* adults. Abamectin and spirodiclofen were selective to *A. largoensis* adults. Fenpyroximate and cyflumetofen were selective to *A. largoensis* adults depending on the exposure route (feeding on cyflumetofen-exposed prey and residual contact with fenpyroximate). The results show that the selectivity of some acaricides to *A. largoensis* can be enhanced by restricting exposure to a single route (residual contact, direct contact, or pesticide-laced prey). We are currently studying the selectivity of insecticides to these predatory mites, as well as the effects of tank mixtures of acaricides and insecticides on *A. largoensis* and *B. yothersi*, a practice commonly used by growers to control several pests simultaneously. We aim to develop an IPM program for *B. yothersi* within a broad context that involves the management of different citrus pests.

Keywords: Biological control, chemical control, *Amblyseius largoensis*, selectivity, compatibility

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