

Effect of monocrotophos and the acaropathogen, *Fusarium semitectum*, on the broad mite, *Polyphagotarsonemus latus*, and its predator *Amblyseius ovalis* in the field

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Abstract

Chili crops suffer from damage by the broad mite, *Polyphagotarsonemus latus*, and they also harbour a predatory mite, *Amblyseius ovalis*, as a potential control agent. To understand the change in the population of these mites when applying the acaricide monocrotophos and an acaropathogenic fungus, *Fusarium semitectum*, experiments were conducted in India during *Kharif* (Sept-Jan) and summer (March-June). Monocrotophos (0.05 and 0.025%) and *F. semitectum* (formulated in oil emulsion and dust water; 108 spores/ml) were sprayed in the field on the chili variety 'Byadagi', commonly used in Karnataka (India). Mite populations were estimated at 15-day intervals, starting 30 days after planting the chili crop. Dry chili yield was used for comparison of the treatments. Overall mite population estimation indicated that *F. semitectum* was effective to suppress broad mites, either alone or in combination with monocrotophos. The combination of *F. semitectum* with the recommended dose of monocrotophos (0.05%) best suppressed *P. latus*, whereas it did not affect *A. ovalis* numbers. Dust-water formulation of *F. semitectum* in combination with 0.05% monocrotophos suppressed broad mites better than the one mixed with a sub-lethal dose (0.025%) of the toxicant. The predatory mite population was not affected by *F. semitectum* nor by monocrotophos. Oil-emulsion formulation was as effective as the combination of dust water formulation and monocrotophos in both seasons. Considering the chili dry yield of all treatments, the fungal formulation sprayed in combination with monocrotophos (1.06 t/ha) gave the best control followed by the monocrotophos alone treatment (0.78 t/ha). Oil-emulsion formulation obtained the highest benefit-cost ratio (6:1) which suggests that the application of the oil formulation against the mites is feasible.