



The lychee erinose mite (*Aceria litchii*): pest status and management in Florida

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The lychee erinose mite (LEM) (*Aceria litchii*) is an important pest of lychee. This minute mite prefers to feed on young new flush, causing the formation of hypertrophic trichomes, known as erinea. In Brazil, LEM has been reported to cause 80% yield reduction. Its interception in Lee County, Florida, in 2018, triggered a quarantine and subsequent eradication program. However, eradication efforts failed to control LEM spread in Florida. Therefore, an integrated pest management program is urgently needed to mitigate the damage caused by this mite in recently invaded areas. By correlating erinea development with the mite population levels, we found that erinea of amber color have higher LEM populations. Subsequently we developed a method to evaluate acaricidal efficacy, by artificially infesting lychee seedlings with amber LEM-infested leaflets. Using this method, we tested ten acaricides for efficacy as prophylactic and/or curative treatments to protect the new flush. Fenpyroximate (2.38 L/ha), pyridaben (1.25 L/ha), tolfenpyrad (2 L/ha) and sulfur (22.5 kg/ha) showed potential as preventative prophylactic treatments but were ineffective in controlling existing infestations. We also developed a postharvest treatment consisting of paraffinic oil dips for one minute under constant agitation. This treatment can disinfest fruit from LEM, allowing growers to ship and sell their fruit outside the quarantined areas. Little information is available regarding the ecology of this pest and how it locates the new flush while being hidden inside the erinea. Chemical analysis of infested and non-infested lychee plants identified 27 volatile compounds from five chemical groups, including aldehydes, alkanes, terpenes, phenols, and ketones. The most abundant compounds were nonanal, decanal, limonene, sabinene, β -caryophyllene and α -curcumene. These compounds were evaluated in two-choice bioassays for LEM attraction at 3, 5, 7, 10, 25, 50, 75 and 100% concentrations. Results showed that the concentration influenced LEM attraction or repellence to individual compounds, often showing attraction in low concentrations. Our results can serve as the basis for developing a lure for control of LEM in the field. Current research focuses on the chemical ecology of LEM and developing integrated pest management programs for this important pest.

Keywords: Litchi, integrated pest management, chemical control, lychee mite, erinea, galls, volatiles, chemical ecology