POSTHARVEST CHAMBER FUMIGATION OF CHILEAN FALSE MITE WITH CYLINDERIZED PHOSPHINE OR METHYL BROMIDE

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Abstract.
Chilean false mite (CFM), *Brevipalpus chilensis* (Baker) (Trombidiformes: Tenuipalpidae), is a pest of concern to certain countries that import fruit from Chile. Phosphine chamber fumigations at 1.3 ± 0.5 ºC ($\bar{x} \pm s$) as well as methyl bromide (MB) chamber fumigations at 4.4 and 15.6 (± 0.5) ºC ($\bar{x} \pm s$) were evaluated for postharvest control of CFM in series of exploratory fumigations to establish a toxicological response for adult, nymph, and egg life stages. Efficacy data is presented in the context of fresh fig and table grape imports from Chile. Varying the applied MB dose and the differential sorption of MB by the loads resulted in a range of exposures, expressed as concentration x time cross products (CTs), which were verified by gas-chromatographic quantification of MB in chamber headspace over the course of each fumigation. A kinetic model of MB sorption was developed for the quarantine fumigation of fresh figs and table grapes based on the measurement of exposures and how they varied across the fumigation trials. The model describes how to manipulate the applied MB dose, the load factor, and the load geometry for fresh figs and table grapes so that the resultant exposure is adequate for CFM control. The applied dose of cylinderized phosphine (1000 or 2500 ppm) did not affect the efficacy of fumigation, suggesting that the load factor and the load geometry for fresh produce are inconsequential, as long as the minimum headspace concentration at the end of fumigation is ca. 1000 ppm phosphine.

References.

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