

## **Research toward developing IPM systems for the ham mite, *Tyrophagus putrescentiae*, following the phase-out of methyl bromide**

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### **Abstract**

Southern dry cured ham remains one of the few commodities in the USA that still has a critical use exemption for methyl bromide to control the ham mite, *Tyrophagus putrescentiae*. Here we review a series of studies that represent either direct alternatives to methyl bromide, or provide one or more tools for prevention and monitoring-based IPM programs for ham mites. We now have a trap that consists of a disposable plastic Petri dish that allows entry of mites responding to a food lure. We monitored mite populations in three commercial ham facilities using 20 traps distributed evenly throughout the buildings for consecutive one-week periods. Mite numbers in traps confirmed that fumigation in certain circumstances caused severe reduction in mite populations, and showed that mites would slowly or rapidly rebound following fumigation. We have developed preventive measure to manage mites in ham facilities that include determination of the most active residual sprays for treating surfaces on which mites will traverse during dispersal and migration. Deltamethrin and chlorfenapyr proved highly effective as a residual pesticide. Dips and coatings of ham piece with food-safe compounds such as propylene glycol demonstrated that hams could be protected by applying such compounds. Earlier work determined that sulfuryl fluoride, SF<sub>2</sub>, could not eliminate mite eggs within label rates, but phosphine was very effective against all life stages well within its label rate. Unfortunately the corrosive nature of phosphine will require special corrosion-prevention measure to be used during phosphine fumigation. We revisited SF<sub>2</sub> and found that its efficacy at eliminating all mite eggs in a sample can be achieved at 40°C for 36 hrs or more when an upper label rate is applied. Our work provides several IPM tools for the ham industry.

Keywords: mite trap, monitoring-based IPM, propylene glycol, residual pesticides, sulfuryl fluoride, phosphine