CHEMICAL ALTERNATIVES FOR SUPPRESSING THE HAM MITE, *TYROPHAGUS PUTRESCENTIAE*

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Southern dry cured ham remains one of the few postharvest commodities in the United States that still has a critical use exemption for methyl bromide to control the ham mite, *Tyrophagus putrescentiae*. To date very little information is available on the potential for non-fumigant chemicals to control ham mites. We conducted laboratory studies to assess the potential of food grade preservatives to function in coatings on hams to prevent mite infestation and also for registered and experimental pesticides for applying a residual treatment to environmental surfaces to kill mites. We conducted a bioassay with food preservatives in which pieces of ham or whole hams were dipped in or sprayed with a given compound and then exposed to 20 adult mites for 14 days, after which the total resulting population of surviving nymphs and adults was determined. Propylene glycol, the preservative ethoxyquin and a mixture of short-chain hydrocarbons proved effective at preventing mite reproduction on small ham pieces. A simulated field study was conducted in which whole 27-lb green hams were coated with cure mix from Rebel Butcher Supply and then each sprayed with 28 g of 100% propylene glycol, PG. Hams were again treated with cure mix at 8 and 18 days after the first application then washed and cold-smoked at day 21. After smoking, single hams were sprayed with PG either 4 times at 4-week intervals, at 3 week intervals for 5 times and most frequently at 2-week intervals for 7 sprays. One-inch cubes were taken from outer slices of each ham and subjected to a mite reproduction challenge. The non-PG hams and those treated at 4-week or 3-week intervals produced high numbers of mites, but cubes from the ham treated at 2 week intervals produced significantly fewer mites.

Laboratory experiments of registered and experimental pesticides utilized a bioassay in which 20 adult mites were released inside a ventilated glass vial that had been previously treated with 35 ul of a diluted test compound. Mites were allowed to walk on the treated surface for 24 hrs, after which they were moved to clean vials with food for 24 hrs and then assessed for mortality. Each experiment had a solvent-only control and up to 3 concentrations of the test compound (0.5 X, 1 X and 2 X the EPA label rate). Of eight active ingredients tested, we found that an experimental mixture of short-chain hydrocarbons and registered formulations of deltamethrin, chlorfenapyr and a mixture of deltamethrin with chlorpyrifos-methyl had very high mite mortality at the recommend label rates and at half the label rates. Results reported here with food-safe preservatives and with commercial pesticides currently registered by EPA for surface treatments in storage facilities show great promise for IPM of ham mite populations if methyl bromide is no longer available for this purpose in the future.