HAM MITE IPM: MONITORING, PREVENTION AND MITIGATION AS MB ALTERNATIVES

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The ham mite, *Tyrophagus putrescentiae*, is a serious pest of dried meats and cheeses. Infestations of *T. putrescentiae* are controlled with the fumigant methyl bromide in the US under a Critical Use Exemption that is due to expire in 2017. Integrated pest management (IPM) is a context-specific and comprehensive decision-making process that includes facility sanitation, pest prevention, a vigilant pest monitoring program, development of action thresholds based on monitoring data and ultimately one or more cost-effective mitigation measures to implement when a pest population exceeds an action threshold. IPM can be an effective alternative to performing only fumigation with methyl bromide. The work reported here investigates the use of residual pesticides to prevent or reduce pest infestations, using traps for monitoring pest mite populations, and various chemical and non-chemical methods for mitigating mite infestations.

Food-baited traps using disposable Petri dishes and dog food-based lures were used to monitor mite activity over time and space in five dry-cured ham aging rooms from three commercial processing facilities subjected to different fumigation frequencies. In all facilities, there were significant differences in the average trap captures during the weeks before and after fumigation, with the majority of mites found in traps before fumigation. The sharp decline in mites after fumigation was typically followed by weekly increases in trapped mites, in some cases rapidly to a point at which fumigation was needed again. In other buildings pest resurgence was minimal for nearly a year after the one fumigation. Food baited traps can therefore provide useful information on ham mite populations that can help in IPM decisions.

Several pesticide sprays were applied to glass surfaces and screened for their activity against mobile ham mite stages for a period of 24 h. Compounds with promising preliminary results were tested further when applied to surfaces made from concrete, wood or metal inside petri dishes and aged for up to eight weeks. Applications of a pyrethroid only or a combination of the same pyrethroid with an organophosphate showed good activity on metal but had limited residual activity on wood or concrete. The microbial pro-insecticide chlorphenapyr retained its effectiveness on all three surfaces for up to eight weeks. Residual sprays can therefore be used as preventive tactics to limit ham mite infestations. Non-chemical alternatives to fumigation such as extreme cold or extreme heat can be quite effective at disinfesting experimental ham pieces of mite populations. Although phosphine fumigation can mitigate ham mite infestations, it is unacceptable due to its potential for serious corrosion of electrical equipment. Sulfuryl fluoride (SF) was earlier found to be ineffective for ham mite control at a normal room temperature of 25 C. However, recent work indicated that warmer

fumigation temperatures can enhance the toxic activity of SF over various exposure times so that all life stages of mites can be killed.

This work demonstrates that preventive measures against ham mites that include use of pesticide sprays, monitoring mite populations with traps to determine if and when mitigation is needed, and use of extreme temperatures or a combination of heat with SF, can all be included in IPM programs for southern dry cured hams.