

Title Temporal dynamics and response to fogging or fumigation of stored-product Coleoptera in a grain processing facility

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Abstract

Stored-product Coleoptera were monitored continuously over 22 months using pitfall traps at an operating food mill and adjacent warehouse in Kansas. Mill management practiced conventional pest management, including monthly crack and crevice applications of a residual insecticide and semi-annual fumigation with methyl bromide in the mill, and application of dichlorvos+pyrethrin (commonly called fogging) in the warehouse. The dynamic temporal changes in insect captures and effect of the global interventions on insect captures were analyzed. Data show that more *Trogoderma variabile* individuals were captured in the warehouse than any other species, but *Tribolium castaneum* was captured with greater frequency. *Trogoderma variabile* captures inside the warehouse tended to mirror outside captures suggesting immigration from the outside. The food mill was infested year round with *T. castaneum* but developed substantial populations of *Typhaea stercorea* during the warm months from May through October. Stored-product insects were nearly always captured during the first trapping interval following methyl bromide or dichlorvos+pyrethrin applications, but it was not clear if the insects were surviving inside the structure or if they were rapidly recolonizing after treatment. Population increases immediately following fumigation or fogging occurred only in fungus-feeding species in late spring or summer. The most successful fumigation was conducted late in the autumn when environmental conditions prevented insect activity outside. Information contained in this study provides data that could be used to improve insect management programs for milling and processing facilities.