EFFICACY AND COMPARISON OF FOUR FUMIGANTS AS REPLACEMENTS FOR METHYL BROMIDE

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For the past ten years, DFA has been involved in research studies to evaluate alternatives to methyl bromide (MB). Specifically sulfuryl fluoride (SF), phosphine (PH_3), combinations of PH_3 and CO_2 (cylinder source), propylene oxide (PPO), combinations of PPO and CO_2 have been studied. These studies have included traditional methods and innovative methods to improve efficacy at shorter exposure periods. In this study, funded by the EPA, we evaluated and compared the efficacy of several fumigants on stored products insect species. The specific goal was to determine efficacious CT Product for each fumigant at a prescribed exposure period and temperature. Temperature and exposure period reflects commercial conditions found in the dried fruit and tree nut industries. The fumigants that were used in this studied were: methyl bromide, sulfuryl fluoride, phosphine/CO_2 (cylinder source), and propylene oxide. The insects that were studied were warehouse beetle (WB) *Trogoderma variable,* Indian meal moth (IMM) *Plodia interpunctella,* red flour beetle (RFB) *Tribolium castanium.* Both eggs and postembryonic stages were compared. These species are three of the most common stored product insects. Results show a direct comparison in efficacy between these other fumigants and MB under certain conditions. One major advantage of these alternatives is that they are more environmentally friendly than MB.