

TOXICITY OF METHYLPHOSPHINE TO SUSCEPTIBLE AND
PHOSPHINE-RESISTANT STRAINS OF FOUR SPECIES OF STORED
PRODUCT INSECTS

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The future use of phosphine as an ideal fumigant of stored commodities is threatened by the emergence of a widespread resistance in stored-product insects in many countries. The mechanism of phosphine-resistance apparently involves respiratory exclusion of the gas as well as detoxification by resistant insects. Our research into finding a suitable gaseous chemical to control phosphine-resistant insects led us to study the fumigant properties of methylphosphine (CH_3PH_2), a close analogue of phosphine (PH_3). Exposure to methylphosphine produced much greater mortality in PH_3 -resistant strains of four species of stored-product insects than in their corresponding susceptible strains. It is likely that the presence of the methyl group in CH_3PH_2 prevents exclusion by the main resistance mechanism. Furthermore, greater toxicity of methylphosphine to resistant, compared with susceptible, strains indicates that the PH_3 -resistance mechanism may be metabolising methylphosphine to toxic products. The possibilities of using methylphosphine to control PH_3 resistant insects, and potential strategies for resistance management, are discussed.