

THE USE OF PHOSPHINE FOR INHIBITION OF FUNGAL GROWTH IN STORED GRAINS

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ABSTRACT

Phosphine (PH₃) is in widespread use for the control of insects in stored grains. Phosphine may be applied as a single treatment to kill insects already present in grain, or at a low level over an extended period for the continuous control of insects in sealed grain storages (SIROFLO process). Because phosphine acts as a respiratory inhibitor, it can also control the growth of fungi in grain stored at marginal moisture contents, although it does not actually kill dormant fungal spores. The primary fungal invaders of stored grains are *Eurotium* species, *Aspergillus* series *Restricti* species, particularly *A. penicillioides* and *A. restrictus*, and *Wallemia sebi*. Phosphine has been shown to be useful in controlling the establishment of populations of these fungi in relatively moist grain over short storage periods of up to four weeks, by increasing the length of the lag period, and slowing the growth rate. This paper reviews the effects of phosphine fumigation on fungal succession and the development of storage fungi in grains, with reference to specific examples from the authors' own work, and from published literature. The practical implications of using phosphine to prevent fungal deterioration of stored grains are assessed.