

EFFECTS OF CONTROLLED ATMOSPHERES AND FUMIGANTS ON
STORAGE FUNGI: A REVIEW OF RESEARCH ACTIVITIES AT
SEAMEO BIOTROP

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Research activities at SEAMEO BIOTROP on the effects of carbon dioxide and fumigants on the development of fungi in stored products are covered by this paper. The effects on fungi of CO₂ treatment of maize; phosphine in milled rice, maize and soybean meal; and methyl bromide in milled rice and soybean are discussed. Studies on the combined effects of CO₂ and phosphine on growth and sporulation of *Aspergillus flavus* are also presented.

In maize, CO₂ had no significant effect on total fungal populations, but *Eurotium chevalieri* decreased during storage. Phosphine reduced *Aspergillus wentii* and increased *Eurotium chevalieri* populations in maize after fumigation, but in soybean meal, phosphine fumigation caused only a temporary reduction in fungal populations, which increased again during storage. In milled rice stored in jute and polypropylene bags, phosphine retarded growth of the predominant storage species, *A. penicillioides*. Methyl bromide reduced total fungal populations, and populations of *Eurotium* species and *A. sydowii*, in milled rice and soybean 2 days after fumigation, but populations had increased again after 45 days storage.

Mycelial growth and sporulation of *Aspergillus flavus* cultures were partially inhibited by 20% CO₂ with 0.5 mg/L phosphine. At 80% CO₂ and 3.5 mg/L phosphine, mycelial growth of *A. flavus* was almost totally inhibited and there was no sporulation.