Abstract

Phosphine, a fumigant widely applied for insect control, may be an alternative for controlling fungi and mycotoxins in high-moisture stored grains. Published papers have demonstrated that the fumigation conditions for fungal control (concentration and exposure time) have to be established according to the type and moisture content of the grain as well as the species to be controlled. With respect to fungal control, recent studies with corn have shown that water activity (aw) is critical in determining the maximum "protective period", due to the growth of *Fusarium verticilloides* and yeasts and yeast-like fungi, which appear to be more tolerant to phosphine. The effect of phosphine on the production of mycotoxins has, so far, only been studied for aflatoxins in peanuts and corn grains, where very promising results were obtained. Studies on more toxigenic moulds and other mycotoxins are needed in order to fully evaluate the use of this technique to control fungi and to avoid production of mycotoxins in other commodity-mould interactions. Problematic situations exist where grains can be re-wetted by condensation during shipment or when grains with high m.c. are kept in storage for long periods prior to drying to a safe level. Phosphine can be carefully applied in order to guarantee the correct dosage in most situations. These include in-transit fumigation in good gastight and pressure-tested freight containers; bagged commodities in well-sealed and vacuum-tested sacks; and bulked grains in bins, silos or floor stores, with positive pressure systems or recirculation of the atmosphere. Conventional phosphide formulations or cylinderised formulations can be used as appropriate.