

Donahaye, E.J., Navarro, S., Bell, C., Jayas, D., Noyes, R., Phillips, T.W. [Eds.] (2007) Proc. Int. Conf. Controlled Atmosphere and Fumigation in Stored Products, Gold-Coast Australia. 8-13th August 2004. FTIC Ltd. Publishing, Israel. p. 591

WINTER FUMIGATION OF A FARM SILO WITH PHOSPHINE

J.C. HOLLOWAY, B.E. WALLBANK, K.E. SMITH

*NSW Agriculture, PMB Pine Gully Rd, Wagga Wagga NSW 2650, Australia,
joanne.holloway@agric.nsw.gov.au*

ABSTRACT

Phosphine is not recommended for grain fumigation where the bulk temperature is below 15 °C, but this condition often arises in infested small farm silos during winter in southern Australia. To test the effectiveness of phosphine under such conditions, an infested feed bulk of mixed grains (55t) was fumigated in mid-winter with phosphine at 1.5 gm⁻³. The bulk of predominantly barley with some peas and lupins was heavily infested with several insect species. The average bulk temperature was 11.1 °C. Phosphine profiles were then compared with a summer fumigation of wheat at 35.2 °C in a similar silo. Both silos were almost full and had half pressure times above 300 s, indicating excellent gas-tightness. Phosphine concentrations in the bulks reached peaks after about 25 and 8 days in the cool and warm grain, respectively, and then declined. Although the peak concentration in cool grain was 32% lower than in the warm grain, a CT product of 100 ghm⁻³ was achieved in 11 and 5 days, respectively, at all monitoring points in the bulks. No insects were detected following fumigation, indicating that cool temperature fumigations may be feasible in well-sealed silos. However, recommended minimum exposure periods would need to be evaluated.