

Title The effect of fluctuating temperature and humidity, and aeration, on population growth of *Acarus siro* (L.) near the surface of a grain bulk.

Authors Dunn, J. A.

Citation Advances in stored product protection. Proceedings of the 8th International Working Conference on Stored Product Protection, York, UK, 22-26 July 2002 (2003); 173-178

Abstract

The effect of fluctuating temperature and relative humidity with and without intermittent aeration on the productivity of *A. siro* was tested on the surface of a 250-tonne bulk of grain. Four pipes were inserted into the grain bulk. Two of the pipes had open bases and were therefore subject to the processes of aeration (i.e. airflow, cooling etc.), whereas the other two had their bases sealed. Each pipe contained mites held within nylon-mesh bags. Ten bags were removed from each of these pipes at intervals of 1008 h (every sixth week) from 18 October 1999 until 15 May 2000. A total of 482 h of low-volume cooling, controlled by set-point thermostats, was operated during the colder winter months. The number of *A. siro* mites at each life stage was determined by flotation analysis and light microscopy. The results showed that during those intervals when there was most aeration for cooling (141 and 284 h) or aeration for drying (18 h) there was a significant decrease in the productivity of mites in the aerated pipes. Differences were not significant when the aeration for cooling was shorter (9 and 29 h). Temperature, relative humidity and moisture content also affected mite productivity. A rise in temperature, relative humidity and/or moisture content increased the total mite productivity, whereas a decrease in temperature, relative humidity and/or moisture content decreased total mite productivity. However, there was often an interaction between these variables.