

TEST METHODS FOR LEVEL OF SEALING OF GRAIN STORES - PRESSURE TESTS AND TRACER TECHNIQUES

Jonathan BANKS

*Stored Grain Research Laboratory, CSIRO Division of Entomology, GPO Box
1700, Canberra A.C.T. 2601, Australia.
Fax: 6162464202*

Verifiable and convenient predictors of success of fumigation or CA are needed prior to the actual addition of the gas. Two test systems are in use - pressure testing and tracer gas techniques. There are two versions of pressure test: pressure decay (Pt test) and pressure-flow test (PQ test). The former is quick and simple but can be less informative than the latter. Both suffer from two defects: they must be conducted with the contents of the structure under test at constant temperature, and they give 'worst case' estimates of suitability for fumigation. Typically, gasholding will be better than predicted so on some occasions a structure may be adequately sealed even though it does not meet a set level. Tracer gas techniques (e.g. with CO) give a more directly applicable test, but require several days of intensive monitoring to achieve a result. The various test results can be related mathematically. Approximately, a pressure half life of 5 mins. from a Pt test in a full structure corresponds to a gas loss rate of less than 5% per day in grain stores. This is an adequate level of sealing for most fumigation and CA processes and corresponds to several national standards. As a special case, a decay time of >10 sec. is adequate for freight containers. Practical examples of test results and their correlation with success or failure of treatments are given, and the appropriate level of test value discussed with regard to various treatment systems.