

A PRELIMINARY STUDY ON INTERACTION FACTOR IN "TRIPLE LOW" GRAIN STORAGE TECHNIQUE

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In order to determine the mechanism of the "Triple-Low" grain storage technique and eventually to be able to construct comprehensive mathematical models describing the mechanism, we need not only to measure the internal heat source (grain respiration) but more importantly to determine the interactions among phosphine concentration, oxygen concentration, and temperature.

A container 1.5m high and 1m in diameter situated in a room with constant temperature ($\pm 0.3^{\circ}\text{C}$) was used in this research. Distribution of oxygen and carbon dioxide were measured under these conditions when the container was either sealed or not sealed. Temperature distribution was determined either with or without the release of phosphine (low concentration 0.213g powder/m^3). Several phenomena were observed:

1. Oxygen concentration in the upper half of the container decreased when the container was sealed with a plastic sheet and carbon dioxide increased. The level of highest oxygen concentration moved downward.
2. Average grain temperature decreased when a low concentration of phosphine was released. Peak temperature decreased by about 1.8°C .