

LOW TEMPERATURE TO CONTROL STORED-GRAIN INSECTS.

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Stored-product insects have been controlled using physical means for thousands of years. The basic rule of good seed storage, keep seed cool and dry, was employed in neolithic times in the Nile delta by placing clay jars underground. For a number of years, the use of extreme temperatures, particularly low temperatures, has been extensively used to control stored-product insects. The advantages of this type of control are: no residues left on the product after treatment, effective against insecticide resistant strains, and few risks for operators. The inconveniences that prevent the widespread use of low temperatures are: treatment is dependant upon cold ambient air or refrigeration equipment and durations needed for control can be long depending upon temperatures achieved. There are a number of variables that influence the success of a low temperature treatment: the stage of insect, species, their level of cold acclimation, temperature attained, duration and relative humidity. The goal of this review is to introduce some basic concepts of insect cold tolerance and to demonstrate how low temperature is used to prevent or to control stored-product insect infestations.

Index terms: *Cryptolestes*, *Sitophilus*, *Tribolium*, freezing, storage