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# **Czech J. Food Sci.**

## **Kuzmanov D., Dimitrov N.:**

# Forecasting the necessity of grain fumigation during storage

Czech J. Food Sci., 27 (2009): 210-215

According to the simulation models composed for the population growth and feeding damage of the insects: *Sitophilus oryzae* (L.), *Sitophilus granarius* (L.) and *Rhizopertha dominica* (F.) the populations densities have been determined at which the grain fumigation costs at using phosphorus hydrogen preparations equal the damage values caused by insects. The necessity of fumigation can be forecasted, according to the population growth time up to these limits. For this purpose, simulation models at temperatures of 21, 24, 27, and 30° C have been used. The products of time and temperature should be calculated at different temperatures and compared according to the simulation results and forecast temperature values during grain storage in particular granary. The action thresholds have been determined according to the models, at

which fumigation should be carried out so that no economical losses or quality deterioration of grain be admitted. The results forecast have also been confirmed by freshly harvested wheat storage in a flat storehouse and a metal silo bin. It has been established that grain fumigation can be avoided if grain is stored in flat storehouses and cooled down by ventilation.

**Keywords:**

insect; stored grain; damage (loss); simulation model; action threshold; fumigation

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