

Title Heat disinfestation of empty farm silos before inloading.
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Abstract

The efficacy of heat treatment for the control of adult populations of *Tribolium castaneum* and mixed-age populations of *Rhyzopertha dominica* at an experimental 50-tonne silo was evaluated. Heating was conducted with a 54-kW electric heater with an 11-kW radial fan with a speed regulator to pump the hot air into the silo, or with a more powerful heating system consisting of electric liquid petroleum gas burner with a 15-kW axial flow fan. Populations of *T. castaneum* were completely destroyed by the time a target air temperature of 54 deg C was reached (10 minutes). Grain temperatures of 53.4 and 55.2 deg C for periods of 4 and 3 h, respectively, resulted in a mortality of up to 99.99% in the most tolerant developmental stage of *R. dominica*. Complete mortality was obtained by the time a grain temperature of 60.6 deg C was reached at all but one location. An alternative method of heating resulted in complete mortality at 61.8 deg C. Heat disinfestation will be most effectively and economically achieved by using high inlet temperatures to produce rapid heating to a temperature where complete mortality is guaranteed by the time that temperature is reached. The energy cost of such a treatment could be less than \$A1.00 (US\$0.58).