

Title Ozone as a management alternative against phosphine-resistant insect pests of stored products
Author A.H. Sousa, L.R.D'A. Faroni, R.N.C. Guedes, M.R. Tótola and W.I. Urruchi
Citation Journal of Stored Products Research, Volume 44, Issue 4, 2008, Pages 379-385
Keywords Alternative fumigant; Susceptibility; Cross-resistance; Respiration rate; Fitness

Abstract

This study was carried out to assess ozone toxicity to 16 populations of *Tribolium castaneum* (Herbst), 11 populations of *Rhyzopertha dominica* (F.) and nine populations of *Oryzaephilus surinamensis* (L.) collected from six regions of Brazil. These populations were also used to test if there is cross-resistance to ozone and phosphine. The relationship between susceptibility to ozone and respiration rate, and associated fitness costs were also evaluated. The instantaneous population growth rate (r_i), CO₂ production and mean insect body mass of each population were measured. Ozone toxicity was determined using time-response bioassays at the dosage rate of 150 ppm ozone in a continuous flow of 2 L min⁻¹. All of the populations were susceptible to ozone and there was no cross-resistance to ozone and phosphine. The populations of each species differed in respiration rate and body mass, but there was no significant association between respiration rate or body mass and susceptibility to ozone, as was also the case for the instantaneous rate of population increase (r_i). As none of the populations showed resistance to ozone, regardless of their susceptibility to phosphine, ozone is a potential alternative for phosphine resistance management in the insect species evaluated in this study.