

Title Influence of grain type on the susceptibility of different *Sitophilus oryzae* (L.) populations, obtained from different rearing media, to three diatomaceous earth formulations

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Abstract

Bioassays were carried out to assess whether the commodity, from which adults of the rice weevil *Sitophilus oryzae* emerged, influences the insecticidal efficacy of three diatomaceous earth (DE) formulations: Protect-It™, PyriSec® and DEBBM. Protect-It™ is a DE formulation that contains 10% silica gel, while PyriSec® and DEBBM are enhanced DEs that contain natural pyrethrum and the plant extract bitterbarkomycin, respectively. The *S. oryzae* populations tested were reared on wheat, barley or maize and the susceptibility of each to the DE formulations was assessed on all three commodities. The DE application doses were: 500 ppm for Protect-It™ and PyriSec®; 150 and 75 ppm for DEBBM. Mortality of *S. oryzae* adults was counted 7 and 14 d after their exposure on the treated commodities. Bioassays were carried out at 25 °C and 55% r.h. Barley-reared *S. oryzae* were the most tolerant of all formulations and treated commodities, whereas maize-reared were the most susceptible ones. DE effectiveness was always lower in maize than in wheat or barley irrespective of the commodity from which the populations were obtained. Furthermore, Protect-It™ and PyriSec® were more effective than DEBBM in wheat or barley, but not in maize.