

Title Effectiveness of spinosad combined with diatomaceous earth against different European strains of *Tribolium confusum* du Val (Coleoptera: Tenebrionidae): Influence of commodity and temperature

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Citation Journal of Stored Products Research, Volume 45, Issue 3, July 2009, Pages 165-176

Keywords Spinosad; Diatomaceous earth; Combination; *Tribolium confusum*; Wheat; Maize

Abstract

Laboratory bioassays were carried out to assess the effects of combining spinosad at 0.01, 0.1 and 0.5 ppm, with the diatomaceous earth (DE) formulation SilicoSec at rates of 150, 300 and 600 ppm, against larvae and adults of three different populations of *Tribolium confusum* du Val (Coleoptera: Tenebrionidae), originating from different European countries (Greece, Portugal and Denmark). Tests were conducted on wheat and maize at 25 and 30 °C. Survival of *T. confusum* larvae was assessed after 7 d exposure and survival of adults was assessed after 7 d and 14 d of exposure. At each dose of spinosad, survival of *T. confusum* individuals decreased as the rate of DE increased. As temperature increased, the efficacy of spinosad and SilicoSec applied either alone or in combination also increased. The efficacy of spinosad alone was slightly higher on maize than wheat, while the reverse was noted for all the tested combinations of spinosad with DE as well as in the case of the application of DE alone. The strain from Portugal was always the least susceptible of the three tested. Our study indicates that it is possible to combine low doses of DE (<600 ppm) with spinosad (<1 ppm) to control adults and larvae of *T. confusum*, especially at temperatures >25 °C.