

Title Efficacy of spinosad in layer-treated wheat against five stored-product insect species
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Citation Journal of Stored Products Research, Volume 45, Issue 4, October 2009, Pages 236-240
Keywords Beetles; Psocids; Surface treatments; Grain protectants

Abstract

The biological insecticide spinosad was evaluated in laboratory bioassays as a surface treatment for wheat to control adult *Rhyzopertha dominica*, *Sitophilus oryzae* and three psocid species, *Liposcelis paeta*, *L. bostrychophila*, and *Lepinotus reticulatus*. Spinosad was applied at 1 ppm to 35 g of wheat placed in a vial or to the upper one half, one fourth, or one eighth layer of the wheat; insects were either added to the vials before or after the wheat. When *R. dominica* were introduced into the vials after the wheat, mortality was 100% except for 83% mortality in the one eighth layer treatment. In contrast, when adults were placed in the vials before the wheat, mortality was 100% only when all of the wheat was treated. Mortality of *S. oryzae* was lower compared to *R. dominica* but there was some evidence of upward movement into the treated layers. Mortality of *L. paeta* and *L. bostrychophila* was <50% when the entire quantity was treated, in contrast to 100% mortality of *L. reticulatus*. However, for all psocid species, overall mortality decreased with decreasing depth of the treated layer. The results of this laboratory study show that while spinosad has some effectiveness as a layer treatment on a column of wheat, efficacy will be dependent on the target species, the depth of the treated layer, and the upward or downward mobility of the insect species.