

Title Persistence and efficacy of spinosad on wheat, maize and barley grains against four major stored product pests

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Abstract

The insecticidal and residual effect of spinosad on wheat, maize and barley grain was evaluated in the laboratory against adults of *Sitophilus oryzae* (F.) (Coleoptera: Curculionidae), *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae), *Tribolium confusum* (DuVal) (Coleoptera: Tenebrionidae), *Cryptolestes ferrugineus* (Stephens) (Coleoptera: Laemophloeidae) as well as against larvae of *T. confusum*. Spinosad was applied as a solution to 2 kg lots of each commodity at three concentrations, 0.1, 0.5 and 1 ppm, and the treated grain quantities were kept at 25 °C and 65% RH. Samples were taken from each concentration-commodity combination at the day of storage and every 30 d for 6 consecutive months (6 bioassays). The test species were exposed for 14 d to the samples and mortality and reproduction were assessed over this exposure interval. With the exception of *T. confusum*, 1 ppm of spinosad was highly effective against the remainder of the tested species and provided protection for a period of storage at least 4 months. Although in general, spinosad performance was not very much affected by the grain type, efficacy on maize was less stable over the 6-month period of storage and declined sooner compared to the other commodities. Spinosad almost suppressed progeny production of *R. dominica* during the storage period, but did not suppress progeny of the other species, since progeny were recorded even 30 d post application especially with the lowest of the tested concentrations. The results of this study indicated that spinosad may provide suitable protection for 6 months against *S. oryzae* or *R. dominica*, but is not suitable for long-term protection against *T. confusum* or *C. ferrugineus*.