

**Title** Residual effects of deltamethrin and malathion on different populations of *Sitophilus granarius* (L.) on treated wheat grains

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#### **Abstract**

The impact of 2-, 7-, 14-, 30-, 90-, 150- and 720-day-old deposits of deltamethrin, applied with or without the synergist piperonyl butoxide (PBO), and of malathion, on adults of different populations of granary weevil *Sitophilus granarius* on wheat was investigated in the laboratory. The insecticides used were commercial formulations and their application rates were as recommended: deltamethrin (dustable powder) 0.5 mg a.i./kg, deltamethrin + PBO (1:10) (emulsifiable concentrate) 0.25 mg a.i./kg, and malathion (dustable powder) 10 mg a.i./kg. The weevil populations examined were: (a) a laboratory population, (b) field populations with different susceptibility to some insecticides as established previously, and (c) populations selected in the laboratory with deltamethrin or pirimiphos-methyl.

The 2-day-old deposit of malathion caused complete mortality of all weevil populations after 7 and 14 days. The corresponding deposit of deltamethrin was 100% effective only against the laboratory weevils after 7–14 days, while deltamethrin at the lower level formulated with PBO caused about 90% mortality of laboratory weevils and much lower levels of kill among field and selected weevils.

Deposits of deltamethrin and malathion up to 90 days old killed all field weevils after 14 days of exposure. The 150-day-old deposit of deltamethrin was also 100% effective against field weevils exposed for 14 days, while the effectiveness against selected populations was around 50%. Malathion deposits of the same age gave 40–50% mortality of field weevils, and 4–68% mortality of selected weevils. The 720-day-old deposits of malathion were ineffective against all weevil populations, while the mortality of laboratory weevils after 14 days contact with deltamethrin deposits of the same age was 76%, and that of field and selected weevils about 50%.