

Title Sorption and insect toxicity of propylene oxide in dried fruits and nuts.  
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#### Abstract

Dried fruits and nuts were fumigated with a mixture of propylene oxide (PPO) and CO<sub>2</sub> (8%:92% w/w) in 28.42-litre chambers to determine PPO sorption rates in these products and toxicity to a variety of postharvest insect pests. A 48-h fumigation using a rate of 45 mg/litre at 38 deg C resulted in more than 97% sorption in almonds, pecans and walnuts, and induced 100% mortality of mixed life stages of the following insects: Indian meal moth (*Plodia interpunctella*), red flour beetle (*Tribolium castaneum*), confused flour beetle (*T. confusum*), warehouse beetle (*Trogoderma variabile*), cigarette beetle (*Lasioderma serricorne*), lesser grain borer (*Rhyzopertha dominica*) and saw-toothed grain beetle (*Oryzaephilus surinamensis*). The 48-h fumigations resulted in PPO residues in the nuts that were below the tolerance level (300 ppm). The residues dropped to undetectable levels following aeration for 3 days. A 24-h fumigation of walnuts, raisins and figs infested with *P. interpunctella*, *Trogoderma variabile* and dried fruit beetle (*Carpophilus hemipterus*) using a rate of 75 mg/litre at 26.7 deg C resulted in 78, 95 and 93% sorption, respectively, but failed to provide complete mortality of the insects. Susceptibility to PPO was *C. hemipterus* > *P. interpunctella* > *T. variabile*. The rate of PPO sorption into walnuts, raisins and figs was independent of rate.