

**Phytochemical Toxicity of Formulated Neem Oil-based Pellets
as Biofumigant for Controlling *Sitophilus oryzae* (L.) in Organic Rice ***

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The efficacy of different formulas of neem oil-based pellets was assessed on organic rice with fumigant toxicity against *Sitophilus oryzae* (L.) along a 48-week storage period. They were investigated on the basis of dry weight loss, mortality, fecundity and progeny development resulting from oviposition. A sensory test was also evaluated on a hedonic scale.

With regard to formulations, neem oil-based formulated with certain volatile substances such as camphor, borneol or menthol resulted in a significant reduction in oviposition and adult emergence of *S. oryzae* (L.) Their effectiveness as grain protectant showed that the formulas mostly gave good protection to organic rice against damage of *S. oryzae* (L.) in storing. In contrast, neem oil-based pellet formulated with essential oil as clove oil did not demonstrated any feeding deterrence and growth inhibitory effects. It additionally reduced the biological toxicity of neem oil on rice weevils. A sensory evaluation indicated that grain treated over a 48-week period with neem oil remained a best smell, whereas neem oil formulated with clove oil or menthol showed the worst disagreeable smell. Other qualities such as firmness, stickiness, whiteness and appearance remained unaltered and showed no significant differences by untreated control and neem oil singly.

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