

Title Efficacy of combining Niger seed oil with malathion 5% dust formulation on maize against the maize weevil, *Sitophilus zeamais* (Coleoptera: Curculionidae)

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Abstract

The combined effects of Niger seed oil and malathion, 5% dust, against the maize weevil, *Sitophilus zeamais*, were evaluated to determine the minimum effective rate(s) of the combinations that can provide adequate protection to maize seed against attack by weevils. Niger seed oil at the rates of 0%, 10%, 20%, 30%, 40%, 50% and 100% of the recommended application rate, 5 ml kg⁻¹, was combined with malathion at the respective rates of 100%, 50%, 40%, 30%, 20%, 10% and 0% of the recommended application rate, 0.5 g kg⁻¹. All combinations provided complete protection to maize seed from the maize weevil up to 90 days after infestation. To determine the residual effects of the treatments, weevils were reintroduced to the grain that had been treated 90 days previously. In addition to 100% malathion, 10% Niger seed oil + 50% malathion, and 20% Niger seed oil + 40% malathion, were fully effective in controlling *S. zeamais* for a further 156 days after this re-infestation. Therefore, these combinations could be considered as a potential component in an effort to establish integrated management of the maize weevil. Residual performance of both oil and malathion against the weevils was primarily affected by the dose of malathion, with higher doses of malathion providing greater protection for a longer period. Niger seed oil treatment lowered the level of seed germination at the application rate of 5 ml per kg of maize.