

Novel Insecticides as Seed Protectants for the Management of Storage Pests of Hybrid Maize

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ABSTRACT

The efficacy of newer insecticides with novel modes of action viz., flubendiamide, emamectin benzoate, spinosad, thiodicarb, indoxacarb and lufenuron were evaluated against the storage pests of hybrid maize. Toxicity bioassay studies were conducted against lesser grain borer, *Rhyzopertha dominica* and red flour beetle, *Tribolium castaneum*. Differential toxicity of newer insecticides was observed with the two test insects where *R. dominica* was found to be more susceptible than *T. castaneum*. All the newer insecticides provided good control (> 86%) of *R. dominica* within three days of exposure to treated maize seed compared to chemical check deltamethrin (76.7 %) and untreated control (0%). Emamectin benzoate (100%), spinosad (93.3) followed by thiodicarb (73.3) were found effective against *T. castaneum* than deltamethrin which recorded less than 50 % adult mortality at 15 days after exposure. Twelve months after storage, spinosad and emamectin benzoate proved to be the best treatments with no insect damage on treated maize followed by thiodicarb, indoxacarb, lufenuron (1.3 %) and deltamethrin (2.9%) compared to untreated control (13.73 %). There are no significant differences in quality parameters viz., oil%, protein %, starch and moisture content of treated seed up to 12 months of storage. The germination of maize seed was decreased to 54 % in untreated control within nine months of storage, where the germinability was maintained above certification standards (>80%) with all other treatments except flubendiamide (78 %). Hence, these novel insecticides have the potential to be more effective and safer chemicals and would be a valid addition to pest management programs of storage pests of hybrid maize.

Key words : Hybrid Maize, Emamectin benzoate, *Rhyzopertha dominica*, *Tribolium castaneum*, Seed quality, Storage pests, Spinosad.