Field assessment of the efficacy and persistence of diatomaceous earths in protecting stored grain on small-scale farms in Zimbabwe.

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Abstract

Farmers and grain traders in sub-Saharan Africa are forced to sell stored produce prematurely because of deterioration due mostly to insect damage. Producers expressed a need for a relatively cheap and safe method of insect control. Diatomaceous earths (DE) offer safer alternatives to synthetic chemicals, but information on their efficacy under tropical small-scale farming conditions is lacking. Two commercially available DE products, Protect-It® and Dryacide®, were tested against the major post-harvest insect pests of grains and pulses. On-farm field trials in Zimbabwe showed that both inert dusts gave significant protection against insect damage when admixed with farm stored maize, sorghum and cowpeas for periods of 40 weeks. However, efficacy of these DEs is closely linked to the application rates and differs between commodities, locations and insect pests. An admixture application rate of 0.1% w/w of Protect-It® or Dryacide® can be recommended to protect both maize and cowpea grain that is to be stored for four months or longer in Zimbabwe. However, Dryacide® was not effective in preventing damage to sorghum grain by the bostrichid *Rhyzopertha dominica* unless applied at a higher rate of 0.2% w/w.