Title Triple-bagging of cowpeas within high density polyethylene bags to control the cowpea beetle*Callosobruchus maculatus* F. (Coleoptera: Bruchidae)

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Abstract

Laboratory and on-farm trials were carried out to determine the effectiveness of cowpeas triple-bagging with heavy-grade polyethylene to control the cowpea weevil, *Callosobruchus maculatus* (F.), the main storage pest of cowpea, *Vigna unguiculata*, Walp, in West Africa. In the laboratory bruchids numbers and seed damage were significantly reduced when storing cowpeas within 2 layers High Density Polyethylene (HDPE) bags of at least 80 μm wall thicknesses. This thickness considerably reduced oxygen concentration in the bag after 5 days of storage and inhibited insect development. However late instar larvae and pupae were less affected by low oxygen concentration. On-farm storage trials with 2 layers HDPE 50 kg capacity bags tightly sealed and placed in an additional woven nylon bag (triple bag) was effective in controlling the bruchids for 7 months. Moreover, seed damage (<7%) and grain germination were not significantly affected (>89%). These findings allow optimizing the triple-bagging technology with readily local manufactured and affordable bags for long duration cowpea storage.