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### **Bruchid (*Callosobruchus maculatus*) Tolerance Assessment of Ten Bruchid Resistant Cowpea (*Vigna unguiculata*) Varieties.**

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#### Abstract

The resistance of cowpea to bruchid infestation has been a major concern to plant breeders as some improve cowpea varieties become susceptible to the polymorphic nature of this insect pest. Ten resistant varieties were collected and screened for bruchid resistance to Cowpea genotypes. Comparative data evaluated from the study indicated that seed coat does not influence bruchid resistance in cowpea seeds. Results showed seed size to be positively correlated with percentage adult emergence of the insect pest. Mean development period for successful adult emergence ranged from 30-46 days. Susceptibility index indicates that majority of the varieties studied were moderately resistant to the bruchid infestation with TVu 11953 being the most resistant of all with index value of 1.78. Analysis of seed coat resistance indicated that antibiosis, not antixenosis is responsible for seed bruchid resistance in cowpea with no significant difference observed in oviposition preference.

Keywords: Cowpea, Resistance, infestation, Bruchid.

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### **Insecticide Spray Regime Effect on Cowpea Yield and Financial Returns in Northern Ghana.**

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Cowpea (*Vigna unguiculata* L Walp) is the second most important legume in Ghana next to groundnut. Insect pests are the most important hurdles to cowpea production in Ghana causing 80-100% yield loss. While several management strategies are available, insecticides are the most effective. Farmers use insecticides, but they spray once in most of the cases which is not enough to control insect pests. Field trials were conducted in 2013, 2014, and 2015 production seasons in three communities of Northern Ghana in order to assess the effect of higher spray regime on yield and net financial returns. The treatments were arranged in split-plot design with 2 spray regimes (one spray and three sprays) in the main plots and 6 cowpea varieties (Sangotra, Apagbaala, Padituya, IT 99K 573-1-1, Zaayura, and farmers' local variety) in the sub plots. Results indicate that spraying cowpeas three times have positive and significant effects on grain yield and financial net return as compared to spraying them only once. Grain yield increases by about 45% as a result of increasing the frequency of application while the net financial return increases by nearly 90%. The first degree stochastic dominance analysis also shows that the higher spray regime is always dominant over the lower spray regime. This implies that applying insecticides three times on cowpea not only increases grain yield and net returns but also reduces the probability of getting lower yields and financial returns which makes it suitable to smallholder farmers who are usually risk averse.

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### **Improved Tolerance to Bruchids *Callosobruchus Maculatus* in Common Bean *Phaseolus vulgaris* through Induced Mutation.**

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Bean production in Zambia is faced with several constraints including low yielding varieties, abiotic and biotic stresses. Crop production ranging from 200 to 800 kg/ha are common against a potential of 3000 to 4000 kg/ha. The bean beetle *Callosobruchus maculatus* (Coleoptera: Bruchidae) is responsible for the largest post-harvest losses in storage. Use of non-synthetic chemical options such as host-plant resistance for the control of *C. maculatus* is strongly encouraged. Induced mutation provides an alternative method of creating genetic variation and affects a wide range of plant characteristics such as morphological, biological and biochemical ones. Therefore, the aim of this study was to generate resistance to bruchids in common beans using induced mutation and to test its heritability. Bean seeds from each of the 18 mutant lines were screened in the laboratory for resistance to *C. maculatus*. Results showed that among the mutant lines, CA38-38-9-B and RB 608 were tolerant to bruchids. The susceptibility index to bruchid attack was 0.000 for CA38-38-9-B as compared to parental lines which was 0.027, indicating high tolerance to bruchid.