

ABSTRACT

Population studies of the pigeonpea pod borer, *Ancylostomia stercorea* (Zeller) (Lepidoptera:Pyralidae) and relations to its parasitoids and host plant, *Cajanus cajan* (L.) Millsp.

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Six parasitoids were found to attack the egg and larval stages of *A. stercorea*, the braconids *Apanteles etiellae isolatus*, *Bracon cajani*, *B. thurberiphagae* and *Phanerotoma bennetti*, the bethylid, *Goniozus punctulaticeps*, and the ichneumonid, *Eiphosoma annulatum*. Pupal diapause in *A. stercorea* was demonstrated and control of this stage was an important component of an integrated programme for the pod borer.

The population parameters, mean generation time ($T = 42.15$ days), intrinsic ($r_m = 0.108$) and finite rate of increase ($\lambda = 1.11$), mean fecundity (34.71 ± 0.23) eggs per female and net reproductive rate ($R_0 = 94.81$) were estimated for *A. stercorea*.

Analysis of temporal distribution of the eggs of *A. stercorea* over two years showed regular cyclical patterns coinciding with the flowering of the host plant. *A. stercorea* egg distribution was best described by Taylor's Power Law ($b = 1.26$) and Iwao's Regression ($\beta = 1.41$) both

indicating aggregation. A sequential sample table based on the egg stage was constructed for use in the field.

Life tables prepared for *A. stercorea* were analysed using conventional key factor analysis and the newer multiple decrement life table approach. Fourth (k_4) and fifth instar mortality (k_5) as well as adult mortality (k_7) were identified as the key mortality factors. The multiple decrement approach revealed that an average of 33.9% mortality occurred in all stages.

Life tables were also prepared for pigeonpea and similar analyses conducted. Mean bud, flower and pod abscission during the entire season was ($30.4 \pm 4.4\%$); ($59.5 \pm 4.5\%$) and ($10.1 \pm 2.5\%$) respectively. The key factor was identified as k_3 (pod I) mortality), whereas the regulating factor was k_2 (flower mortality). Multiple decrement life table analysis revealed that natural factors alone accounted for the major mortality (67.56%) from bud to pod (V) stage during the entire season.

Comparison of insecticides between pest and parasitoids showed that malathion, fenvalerate and decamethrin were good candidates for the protection of *A. etiellae isolatus*, *B. cajani* and *B. thurberiphagae* while causing high mortality to *A. stercorea*.