

Maize and sorghum are the most important food crops in Ethiopia covering over 29% of the total cultivated land. Stem borers result in 20-50% loss to these crops. In the current study, ecology of stem borers and their natural enemies was investigated. Additionally, environmentally rationale management options were examined. Fieldwork was conducted in Ethiopia, while laboratory studies were carried out in Ethiopia and Kenya. Field studies included surveys and investigations on the effect of intercropping on the infestation of stem borers and abundance of their natural enemies. Surveys were conducted in 1999 and 2000. For data analyses SPSS, SAS, Microsoft Excel, ARC View and ACT were used. In the surveys, six stem borer species, 20 parasitoids, 14 predators and seven entomopathogens were identified. The dominant stem borers were *Busseola fusca* Fuller and *Chilo partellus* (Swinhoe) while the most abundant natural enemy was *Cotesia flavipes* Cameron.

The effect of intercropping maize and sorghum with haricot bean on stem borers was compared with monocultures of maize and sorghum at three locations in Ethiopia. Data were analyzed using SAS. Lower stem borer infestation and a higher abundance of natural enemies were observed in the intercropped maize and sorghum than in the monocrop. Intercropping significantly reduced the infestation of stem borers both by influencing the stem borers and their natural enemies. Suitability of different populations of *B. fusca*, *C. partellus* and *Sesamia calamistis* Hampson for the development of different populations of *C. flavipes* was studied in the laboratory at ambient temperature and a photoperiod of 12:12 (L:D) h in Ethiopia. Ten populations of *B. fusca*, one population of *C. partellus*, one population of *S. calamistis* and four populations of *C. flavipes* were included in the study. Thirty 4th instar larvae of the stem borers were exposed to each population of *C. flavipes*. Number of progeny, proportion of hosts producing progeny and sex ratio were recorded. Data were analyzed using SAS. *C. partellus* and *S. calamistis* were found to be the most suitable host for *C. flavipes*. Only two populations of *B. fusca* were suitable for the development of *C. flavipes* indicating the existence of two biotypes of *B. fusca* in Ethiopia.

The effect of temperature and relative humidity on the developmental rate, longevity, fecundity, and population dynamics of an Indian and a North Pakistan population of *C. flavipes* were studied. The experiment was designed in a completely randomized design in factorial arrangement with 30 replications. The two *C. flavipes* populations were examined at nine temperatures and three relative humidities. Data were analyzed using SAS, Jackknife and Turbo Pascal. The lower and upper temperature thresholds for *C. flavipes* development were 15°C and 33°C, respectively. Relative humidity ranging from 40-90% supported development of *C. flavipes*. The Indian and North Pakistan populations performed similarly. Results from this study indicate that natural enemies caused, mortality of 11-20% of stem borers in Ethiopia.