Lepidopteran stem borers are the major pests limiting the production of maize and grain sorghum under subsistence farming conditions of Southern Africa. Classical biological control has traditionally emphasized the control of introduced pests through the importation and/or introduction of coevolved natural enemies from the pest's native home. It is based on the assumption that coevolved natural enemies are best adapted to locating and successfully attacking the target host. On this basis, Cotesia flavipes Cameron (Hymenoptera: Braconidae) and Xanthopimpla stemmator (Thunberg) (Hymenoptera: Ichneumonidae) were introduced in Southern African countries for biological control of Chilo partellus Swinhoe (Lepidoptera: Crambidae) and Chilo sacchariphagus (Bojer) (Lepidoptera: Pyralidae). The current studies were conducted to evaluate the establishment and spread of C. flavipes and X. stemmator in the release locations, assess the impact of natural enemies on the stem borer populations and maize yield, assess the effect of temperature on the development of X. stemmator in three host species, and finally, to study population growth parameters of X. stemmator and Dentichasmias busseolae (Heinrich) (Hymenoptera: Ichneumonidae). Several parasitoids including indigenous and the exotic species were recovered from egg, larval and pupal stem borer development stages. Egg parasitism of more than 80% due to Trichogramma bournieri (Hymenoptera: Trichagrammatidae) was reported on C. partellus eggs in the Southern region of Mozambique. C. flavipes was recovered at all release and other sampling sites. The highest percent parasitism (33.8%) due to C. flavipes was reported at Maracuene, one of the 1996 release sites. This introduced exotic larval parasitoid was reported to increasingly becoming the more abundant in relation to C. sesamiae. The exotic pupal parasitoid X. stemmator was recovered only from C. partellus pupae during the release season (2002/2003) and one year after its release, but it was not recovered in subsequent seasons. Results from field experiments indicated that damage levels due to stem borer attack varied from location to location. High damage levels were reported in the areas where C. partellus is dominant followed by the areas dominated by Busseola fusca Fuller (Lepidoptera: Noctuidae). However, stem borer density was higher at high elevation zones dominated by B. fusca compared to low and mid elevation zones. Yield losses varied from 28.8% to 34.5% across the regions. Yield losses were observed to increase (from 28.9 to 43.3, 34.5 to 40.8 and from 31.2 to 36.4% at low, mid and high elevation zones respectively) when natural enemies were excluded from the maize plots. The impact of natural enemies on maize yield increase was high at lowland zones (26.1%) and lowest at high elevations (7.6%). Laboratory experiment indicated that while X. stemmator successful developed in C. partellus, B fusca and S. calamistis stem borer species, the more suitable host was C. partellus. The parasitoid developed faster at high temperatures and slowly at low temperatures. The lower temperature threshold for X. stemmator reared on C. partellus was 9.76°C and the maximum threshold of 35°C. These results indicate that this exotic parasitoid could survive and remain active at low to mid elevations and could not survive at high elevations where temperatures during winter are usually below 9°C. However, in the a