Stemborers and Striga hermonthica co-exist in cereal fields in sub-Saharan Africa where together they cause crop damage that sometimes results in total crop loss. Striga alters both the chemistry and morphology of cereals and this may influence behaviour and performance of stemborers on the host plants. Studies were undertaken to compare the effects of various levels of Striga infestation of maize on oviposition preference and survival of Chilo partellus. Potted maize plants were exposed to different densities of Striga seeds (0, 1000, 2000 and 3000/pot) and subsequent effects on C. partellus oviposition evaluated in no-choice and choice-tests. In addition, larval arrestment, settlement, feeding, growth and development were assessed. Results showed that Striga infestation and plant height had non-significant influence on oviposition preference of C. partellus, except in 2-choice assays involving uninfested maize and one under high Striga infestation, in which case they preferred to oviposit on the latter. Similarly, Striga infestation had no influence on larval arrest and settlement. The larvae, however, consumed significantly more of the leaves and stems from uninfested than infested maize plants, with a progressive decline in the consumed proportions with increasing level of Striga infestation. Larval food assimilation was not influenced by Striga infestation, but larval period, percentage of pupation and growth rate were significantly higher on uninfested plants as compared to medium and high Striga infested plants. Possible reasons underlying these observations and their implications are discussed.