

Lepidopteran stemborers are a major constraint to the production of cereals in the tropics with *Chilo partellus* (Lepidoptera: Crambidae) being the most serious species. The pest is an exotic species that originated from Asia. Chemical control of the pest is unpractical and can only be effective during a limited period when the first and second larval instars are feeding on the leaf tissues after which they bore into the stem. Classical biological control using parasitoids and predators in an agroecosystem was considered to provide prospects of additional protection to cereals. Leucaena is an essential leguminous agroforestry tree species with several uses besides alley cropping. Leucaena psyllid is threatening the future use of leucaena as an agroforestry tree. Classical biological control using exotic parasitoids has been tried but their establishment and efficacy had not been determined. The current study assessed the role of agroecosystem diversification as a way of promoting the numerical and functional levels of the pests' natural enemies. Studies were conducted at Mtwapa in Coastal Kenya and spanned over a period of 4 cropping seasons.

Treatments consisted of hedgerows of leucaena only, gliricidia only, alternating rows of leucaena and gliricidia, and four plots without trees. During the cropping seasons, maize was planted between the hedgerows while a row of cowpea was planted between the rows of maize. Foliar sprays of malathion to control the psyllid were applied on one of the leucaena only hedgerow. One of the plots without trees was planted with an intercrop of maize and cowpea. The remaining three plots without trees were planted with maize alone and one of them protected from attack by stemborers by use of Bullcock (betacyfluthrin) granules. The treatments were laid out in a randomised complete block design and replicated four times. Mean rates of egg parasitism were found to be high (>70%) while larval and pupal parasitism rates were low (10%) for all the treatments. These rates however did not support the enemies hypothesis (neutral response), indicating that the vegetation structures and cultural treatments established in the study did not enhance the activity of the egg, larval and pupal parasitoids. Predation rates were generally low in all the treatments (6.13%) with no significant difference among the treatments to support the natural enemies hypothesis. Thus, immigration into, retention and efficacy of predators were not influenced by the vegetation structure. Mean larval and pupal mortality rates were low in all the treatments, ranging from 4.8 to 9.6%. Some of the larvae and pupae under this category had a characteristic common dark coloration on the entire body, suggesting that the mortality factor in this case was associated with microbial agents.

These rates however had no significant difference pattern to support the notion that agroecosystem diversification leads to higher natural enemy levels and efficacy. Life table analyses results show no conspicuous natural enemy activity in the more diverse cropping systems as there were no marked variation in intergeneration and mean real generation mortalities among treatments. The main mortality factor was 'disappearance', which represented mortality caused by factors other than parasitoids. Both *Tamarixia leucaenae* and *Psyllaephagus yaseeni* were recovered at every sampling occasion parasitising the leucaena psyllid, indicating their successful establishment since they are present in the field. The parasitism indices obtained showed that the parasitoids had a significant impact on the pest, though not offering effective control. In spite of this, they certainly contribute towards the overall aim of reducing and keeping under check the pest levels.