The effectiveness of coccinellids as natural enemies of aphids in maize, beans and cowpeas intercrop.

A field study was conducted in Busia district of Kenya to elucidate the dynamics of ladybirds in mixed stands of maize, beans and cowpeas to determine their efficacy as sole control measures for Aphids. Maize, beans and cowpeas were intercropped using conventional husbandry practices and the general Coccinellid quantified as follows: Colonies of four Coccinellids, starved for 12 hours to enhance feeding on Aphids were assessed. The effects of weather on the abundance of Coccinellids were also investigated and involved collection of meteorological data from the Busia District Agricultural Office (BDAO) and from Busia Farmers Training Centre (BFTC) and relating them to the abundance and predation values. The predator population was most abundant in the mixed stands of maize and beans (2.33 predators/30 Aphids) as compared to their occurrence in pure stands of cowpeas (0.85 predators/30 Aphids). The genus Cheilomenes spp. was the most ubiquitous predator with a mean of 4.00 individuals/30 Aphids while Hippodamia variegata was the least abundant predator species with a mean of 0.92 individuals/30 Aphids in all the agro-ecosystems. The larvae of Hippodamia variegata were the most bio-efficient, consuming 32.44 Aphids while their adults were the least bio-efficient, consuming 4.22 individuals for a period of 12 hours. The Coccinellids consumed more Aphids at higher aphid densities (24.05 Aphids) than at lower aphid densities (9.44 Aphids) over the same period of time. Rainfall and relative humidity had significant ($F = 3.675$; $P < 0.05$) effects on the abundance of Coccinellids. Temperature had significant ($F = 3.58$; $P < 0.05$) effect on the abundance of Coccinellids though at a lower level. Rainfall ($r = -0.162$) and relative humidity ($r = - 0.084$) were both inversely correlated with the abundance of Coccinellids. On the other hand, temperature was positively correlated ($r = 0.159$) with the prevalence of Coccinellids indicating that warmer and drier conditions favoured their multiplication. Key words: Efficacy, Coccinellids, Aphids, natural enemies, ecological factors, crops.