

Differential Effects of Pesticide Applications on *Liriomyza huidobrensis* (Diptera: Agromyzidae) and its Parasitoids on Pea in Central Kenya

M. M. Guantai, C. P. K. O. Ogol, D. Salifu, J. M. Kasina, K. S. Akutse, K. K. M. Fiaboe

Abstract

Three *Liriomyza* species [*Liriomyza huidobrensis* (Blanchard), *Liriomyza trifolii* (Burgess), and *Liriomyza sativae* Blanchard] have been reported as the most important leafminer pests in vegetable production systems in Africa. In Kenya, farmers rely on indiscriminate synthetic insecticides use. On-farm field investigations were set up at three different locations (Sagana, Kabaru, and Naromoru) in central Kenya to determine the effect of pesticide application on the abundance of leafminers and their parasitoids under three management practices, namely: farmer practice (FP), reduced pesticide use (RP), and a control with no use of pesticides (CO). In addition, laboratory experiments were designed to test the effect of commonly used pesticides in pea production systems in central Kenya—Dimethoate, Dynamec, Thunder, Cyclone, Bestox, Folicur, Milraz, and Bulldock—on *L. huidobrensis* and two of its parasitoids, *Diglyphus isaea* Walker and *Phaerotoma scabriventris* Nixon. The mean numbers of leafminer flies in control treatment were higher than in RP and FP in both first and second seasons across all sites, but RP and FP did not differ significantly. Parasitoid numbers were very low and there was no much variation between treatments at each location in both first and second seasons. No significant differences were observed between the three management practices with regards to the yield measurements. In the laboratory, the estimated LD₅₀ values for *L. huidobrensis* larvae were all more than two times higher than the recommended dosages, while the LD₅₀ of adults were below the recommended dosages. The estimated LD₅₀ values for the parasitoids were much lower than recommended dosages for all pesticides except Thunder. This study, therefore, demonstrates that the pesticides currently used do not control the *Liriomyza* leafminer larvae that constitute the most destructive stage of the pest, but are rather detrimental to their parasitoids. In addition, the current low level of parasitoids recorded under field conditions even where no pesticide was used during this study, warrants consideration of classical biological control programs.

KEY WORDS: Leafminer parasitoid, insecticide, Fungicide, LD₅₀, LD₉₀