



Deutscher Tropentag, October 8-10, 2003, Göttingen

“Technological and Institutional Innovations
for Sustainable Rural Development”

Biological Control of the Diamondback Moth in Eastern and Southern Africa

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Abstract

The key insect pest of crucifers in eastern and southern Africa is the diamondback moth, *Plutella xylostella* (L.). Its management with pesticides has become difficult as it has developed resistance to many common insecticides. Farmers increasingly use insecticide cocktails and spray more frequently. In consequence, undesired side effects of, such as environmental contamination, health risks, high pesticide residues in produce and production costs are increasing. To counteract this development, a biological control project covering Ethiopia, Kenya, Uganda and Tanzania was initiated by ICIPE. The indigenous natural enemy complex was studied first. Six primary parasitoids were identified. *Diadegma* spp. and *Itopectis* sp. (*Ichneumonidae*) were prevalent in the highlands, *Oomyzus sokolowskii* KURDJUMOV (*Eulophidae*) an yet unidentified braconid occurred principally in lowlands. Average parasitisation rates for these species in 277 fields surveyed in Kenya were 7.6%; 0.8%; 11.2% and 0.8%, respectively, 20.8% in total. A survey of 82 fields in northern Tanzania resulted in 10.1% parasitism by three species: *D. mollipla* (4.5%), *O. sokolowskii* (5.4%) and *C. plutellae* (0.02%). In order to improve parasitisation rates, *Diadegma semiclausum*, a larval parasitoid widely and successfully used in southeast Asia, was introduced to Kenya in October 2001. Field releases were made from mid-2003 in three pilot areas of Kenya and in one in Tanzania. Establishment is recorded from all release areas and parasitisation rates by the introduced species have surpassed the combined rate of all indigenous parasitoids. An ex-ante impact assessment predicted a return of 31:1 on the investment in Kenya alone. Additional importations of parasitoids attacking different host stages and adapted to different ecological conditions are planned. The prospects for biological control and the integration of these parasitoids into the pest management system for crucifers are discussed.

Keywords: Biological control, diamondback moth, *Plutella xylostella*