

Toxicity of chlorpyrifos, spinosad and abamectin on cotton bollworm, *Helicoverpa armigera* and their sublethal effects on fecundity and longevity

Samad VOJUDI¹, Moosa SABER¹, Mir Jalil HEJAZI², Reza TALAEI-HASSANLOUI³

¹Department of Plant Protection, College of Agriculture, University of Maragheh, Iran

²Department of Plant Protection, College of Agriculture, University of Tabriz, Iran

³Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, Iran

Abstract

Cotton bollworm, *Helicoverpa armigera* Hubner is the most important pest of cotton, tomato and chickpea in Iran. The pest has been found to develop resistance against conventional insecticides. Using of insecticides with different mode of action may result an appropriate control of the pest and may delay insecticide resistance development. In this study, we attempted to investigate the lethal and sublethal effects of one conventional, two biorational insecticides on larvae at different stages of *H. armigera*, and its adult longevity and fecundity under the laboratory condition. The LC₅₀ values of chlorpyrifos, spinosad and abamectin were 4.6, 62.26 and 460.5 ppm based on formulated materials. The results showed that chlorpyrifos and spinosad were more effective insecticides against 3rd instar larvae of cotton bollworm compared to abamectin based on formulated materials. Furthermore, abamectin and chlorpyrifos negatively affected longevity and fecundity of adults that emerged from treated third instars. But, spinosad had no significant effect on longevity and fecundity of the adults. All the tested insecticides seemed to be effective against cotton bollworm. Spinosad and abamectin might be preferred due to their environmental friendly impacts. Abamectin also markedly reduced female fecundity and longevity for adults exposed as third instars larvae compared with spinosad. The larvicidal and reproductive effects of abamectin against the pest and its biorationality suggest that abamectin is suitable for integration into an IPM program for cotton bollworm.

Key words: *Helicoverpa armigera*, biorational insecticides, life table parameters, lethal and sublethal.

Authors' addresses: Moosa SABER (corresponding author, □
e-mail: Saber@maragheh.ac.ir, msaber@ucdavis.edu), Samad □
VOJUDI (svojoudi@yahoo.com), Department of Plant Protection, □
College of Agriculture, University of Maragheh, □
Maragheh, Iran; Mir Jalil HEJAZI (mjhejazi@tabrizu.ac.ir), □
Department of Plant Protection, College of Agriculture, University □
of Tabriz, Tabriz, Iran; Reza TALAEI-HASSANLOUI □
(rtalaei@ut.ac.ir), Department of Plant Protection, College of □
Agriculture, University of Tehran, Karaj, Iran. □

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