# EFFICIENCY OF SOME CONTROL AGENTS AGAINST AMERICAN BOLLWORM, *Helicoverpa armigera (*Hübner*)* AND NON TARGET USEFUL INSECTS

**BY**

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# ABSTRACT

This study is an attempt to investigate the efficiency of emamectin benzoate and hexaflumuron on the eggs and the 1st instar larvae of *Helicoverpa armigera* (Hübner), under the laboratory conditions hexaflumuron was ineffective when eggs were treated by field rate compared to emamectin benzoate and alpha cypermethrin that induced 100% mortality only when the recommended field rate was applied. The $LC_{50}$ values of emamectin benzoate, hexaflumuron and alpha cypermethrin on the 1st instar larvae were 0.004, 2.44 and 11.36 ppm, respectively based on formulated materials. The results showed that emamectin benzoate, hexaflumuron were more effective insecticides compared to alpha cypermethrin. The mean larval duration periods were 12.0, 13.7 and 5.0 days when treated with the $LC_{25}$ values of emamectin benzoate, hexaflumuron and alpha cypermethrin compared to 16.0 days recorded for control. It is obvious that the three tested insecticides induced highly significant increase in larval and pupal mortality. Emamectin benzoate and hexaflumuron showed severe reduction in adult fecundity, eggs fertility and hatchability. On the other hand, the $LC_{50}$ of emamectin benzoate, hexaflumuron and alpha cypermethrin recorded 0.044, 46.70, and 11.98 in feeding toxicity and 0.006, 1.51 and 0.609 by contact toxicity, respectively.

Emamectin benzoate proved to be the most potent insecticide, feeding and by contact to honeybee workers at $LC_{50,}$ whereas the hexaflumuron was the least toxic one. The repellent activity of the tested insecticides was higher during the first day of application, Emamectin benzoate proved to be the most potent in repelling bee forgers initially and during the $1^{st}$ day (98.81 %), meanwhile hexaflumuron was the least potent one, initially and in the two days, recording 91.68 % in the $1^{st}$ day and 62.87 % in the second day.

In addition, data revealed that hexaflumuron treatment was safety to *Chrysoperla*. *carnea* eggs whereas; emamectin benzoate and alpha cypermethrin were highly toxic. Toxicity to *C. carnae* larvae at $LC_{50}$ recorded 0.005, 10.15 and 2.67 ppm of emamectin benzoate, hexaflumuron and alpha cypermethrin, respectively.