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Investigating the effect of karvin (53% SC) insecticide on cotton bollworm *Helicoverpa armigera* (Hub.) in the cotton fields of Golestan province

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ABSTRACT: Cotton bollworm, *Helicoverpa armigera* (Lep. Noctouidae) is one of the key pests in cotton fields in Golestan province. In some areas the feeding of buds, bolls of cotton and cotton products will be damaged. In this survey a new insecticide product, karvin were tested on cotton bollworm and important natural enemies, coccinellids, chrysopids and braconid in the field of cotton in Golestan province during2013 – 2014. Six treatments (larvin 1 kg/ha , karvin 1 lit/ha, karvin 1.5 lit/ha, karvin 2 lit/ha,avant 250 ml/ha and chek) with four replications were tested at a complete randomized block design in Gorgan. Sampling was done before and 3, 5, 7, 10 and 15 days after spraying. The mortality was calculated using Tilton- Hendrson formula were compared by Duncan s multiple rang test. The results revealed that average percentage of the best treatments for poison Karvin 1.5 lit/ha in 7 to 10 days after spraying with 81.25 – 100 % cotton bollworm and impact on the level 5 % were in group A and other treatments karvin 2 lit/ha with 71.88%, larvin 1 kg/ha 61.50 % and avant 250 ml/ha 56.25 % were the next groups. Therefore, we recommended the new insecticide Karvin with no significant adverse for controlling of cotton bollworn for the next year.

***Keywords*:** Insecticides**,** Karvin, Helicoverpa armigera , Cotton and Golestan province**.**

INTRODUCTION

Cotton Boll Worm, *Helicoverpa armigera* an important pest of cotton in Iran In some areas, causing yield losses and billions of rials to cotton growers bring harm. The most common way to control this pest is the use of chemical pesticides. Due to the high dosage of pesticide use on farms and their high risk for human health and the environment, it is essential to reduce the risk of new pesticides with low dosage to be tested. If the outcome is not only the amount of pesticide in cotton fields, but also decreases billion rials in spraying will be saved. Different in different regions of cotton pests in cotton fields are observed. One of the most important pests of cotton boll worm that in some cotton fields by feeding on buds, flowers and bolls of cotton is causing damage (Ayatollahi,1965 and Mesbah,1993) . Cotton fields most damage in the second and third generations of the pest plague four generations in a year and with respect to time can be 3-4 times spraying spraying the pest to be controlled (Jvanmoghadm,1993).Insecticide Avant 300 ml amount per hectare compared to other poisons moderate effect in controlling sugar beet leaf moth found (Hosseini,2003 and Alavi.2003).In a study in the fields of tobacco poison for pest control *Heliothis*, was diagnosed Larvin(Mesbah,1993).To determine the sensitivity of the pest to some common insecticides in the area of the Ardebil and measure the contact toxicity of pesticides, a study was carried out and pesticide Chlorpyrifos, Atrymphus, Prophonus and Endosulfan were superior(Alhyary,1998).In one experiment Ardebil poison, pesticides endosulfan and Larvin had the greatest impact on Cotton Boll Worm(Taghizadeh,2000).The comparison between the microbial and chemical insecticides was done, Cotton bollworm larvae mortality rate was highest in poisons Carbaril and Larvin(Amyrsadghi,1995).A review was conducted on pesticides used against cotton pests, pesticides Carbaril and

Avant in comparison with Larvin and endosulfan were most effective in controlling the boll worm(Mojeni,2005).To determine the effects of pesticides in cotton fields, a study was done on natural enemies and pesticides Zolon and Larvin least negative impact on the Trichogramma(Zomorodi,1987).Proteus OD 110 is a combination of Tyacholopride and deltamethrin whiteflies and bollworm in cotton and vegetables and controls on natural enemies and bees have not negative effects(Bozsik, 1996).

Material and Methods:

The experimental cotton farm in Golestan province, which has bollworm infestation, was uniform with 6 treatments and 4 replications in a randomized complete block design. Every plot 5 × 10 with a distance of one meter and two meters apart to be repeated. Treatments include:

1-Avant EC150 to the 250 mL per hectare
2. Karvin SC 53% to the 5.1 liters per hectare
3. Karvin SC 53% to a rate of 2 liters per hectare
4. Karvin SC 53% to a rate of 1 liter per hectare
5. Larvin Df 89% to a rate of 1 liter per hectare
6. (Check) control without spraying

Atomizer for spraying motorized sprayer calibration after it was used. For sampling the larval stage, 10 plants randomly selected from each plot, all the buds, flowers and bolls per plant and the number of larvae counts were selected to study. Statistics shooting the day before and 3, 5, 7, 10, and 15 days after treatment were recorded. The mortality of pesticides on bollworm larvae Henderson Tilton formula calculated and statistical analysis and Duncan test done.

Results and discussion:

Statistical analysis was performed based on a data analysis of variance tests the pesticide treatments tested is expressed as follows:

The poison treatment Karvin 1 liter in two tests combined analysis significant differences were observed in 5% and the best of its effect in 10 days after spraying on pest bollworm with an average of 68.75 percent and in group **a** was. In treatment Karvin 1.5 liters in two trials a significant difference was observed and the best of its mortality on pesticide spraying after 10 days and 7 days after spraying with mean 100% of the pest in group **a** were 81.25 % (Table,2).

The poison treatment Karvin 2 liters in two trials a significant difference was not observed in 5% and the percentage effect after 10 days with an average of 88.71 percent on pesticide spraying and was placed in Group **a**. Avant poison treatment differences in two trials was not significant and the percentage effect 10 days after spraying with an average of 25.56 – 75.43percent on pesticides and in group **a**. The poison treatment Larvin significant differences were observed in two trials and the best of its mortality 3 to 7 days after spraying with an average of 5.61 and 38.61 percent had the greatest mortality on the cotton bollworm were placed in Group **a**. In tests carried out on samples tested pesticides on the natural enemies of cotton bollworm and its effect on the results of the investigation show that population dynamic are important natural enemies in cotton fields, such as lacewing, cocciniled and Habrabracon new insecticides Karvin any harmful effect on it whatsoever, and therefore less dangerous poison for natural enemies is important (Table, 1,2,3). Karvin with 1.5 lit/ per hectare had a good effect on the cotton bollworm recommended pesticides and not having a harmful effect on natural enemies as a low-risk poison. This research is consistent with the study of Laboratory studies were conducted on the effects of various growth regulators on the third larvae of *Helicoverpa armigera.* The results showed that 50% of the deaths of larvae of instar 3 *H. armigera* were induced by lephenuron, fluofenoxuron, chloroflurosarone and diphlobenzuron after 120 hours. Also, the results showed that all growth regulators of insect control in *H. armigera* are effective. However, lephenuron and fluofenoxuron had the greatest impact (Khatri, *etal.*,2014).

In conclusion:

According to the results of testing new treatments Karvin dose toxicity 1.5 liters per hectare in terms of the impact on cotton bollworm pests to pesticides is recommended to have a good effect and on important natural enemies to control showed no effect. This is necessary because conventional pesticides bollworm in the area for many years taken In order to avoid the possible resistance of the pest in the future can be accommodated.

Table 1. Analysis of variance of 1.5 liters per hectare percent impact on cotton bollworm pesticide Karvin

Source	df	S.S	M.s	F
Treatment	4	9851.4	2462.85	3.42**
Replication	3	6054.8	2018.27	2.8ns
Year	1	2924.1	2924.1	4.06**
Teat*Date	4	3246.4	811.6	1.13ns
Rep.*Date	3	7332.3	2444.1	3.40**
Error	24	17273.4	719.73	
Total	39	46682.4		

Cv=21.18%

Table 2. Compare Karvin 1.5 liters on average grouping poison Duncan

Date of sampling	Average of percentage	Level 5 %
15 days after of spraying	100	a
10days after of spraying	100	a
7 days after of spraying	81.25	ab
3 days after of spraying	67.75	ab
5 days after of spraying	62.50	b

Table 3. Summary of results the highest percentage of toxins tested on cotton bollworm

Treatment	Date of sampling	Average of percentage
Karvin 1.5 lit/ha	10days after of spraying	81.25-100
Karvin 2 lit/ha	10days after of spraying	71.88
Karvin 1 lit/ha	10days after of spraying	68/75
Larvin 1 Kgr/ha	5 days after of spraying	60.38-61.5
Avant 250 ml/ha	10days after of spraying	43.75-56.25

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