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Efficiency Of Helitec Against Cotton Scoop (Heliothis Armigera Hb) On Beans

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ABSTRACT

The article presents the results of testing the microbiological preparation HELITEC against cotton bollworm on beans.

The results of the experiment showed that in the experimental variants against the first generation, in two farms treated with Helitec at a rate of 0.300-0.400 l / ha with a liquid consumption of 300 l / ha, the biological efficiency was, respectively, on the 14th day after treatment, 96.0-93, 0%.

The advantages of the microbiological method are both the possibility of prevention and their safety for humans, warm-blooded animals and the environment.

KEYWORDS

Helitec, beans, cotton scoop, biological product, efficiency, treatment, spraying, OVX-600, Lepidocide, Beta Pro.

INTRODUCTION

Legumes are in demand crops in many countries of the world, such as India, China, Korea, Russia, etc. There are several dozen species of pests that cause serious harm to legumes. Among them, the most dangerous

pests include spider mites, scoops, aphids, miner flies, silkworms, weevils and others. These pests cause significant harm to leguminous crops, damaging roots, young shoots, vegetative and generative organs.

Some pests, developing in large numbers each year, cause serious economic damage, which reduces the yield of crops grown. Without applying protective measures against pests of leguminous crops, it is impossible to obtain a high and high-quality yield.

The seeds of leguminous crops contain valuable nutrients such as proteins, carbohydrates and fats, which are a valuable food product for the human body. 90% of the world's population consumes the production of leguminous crops as a food product. Recently, the increase in the population increases the requirements for the obtained products of legumes.

One of the reasons that reduce the yield of beans is the negative activity of pests and diseases. Of the pests, the cotton bollworm is especially dangerous, destroying in some years up to 20-30% of the crop.

In modern conditions, the applied plant protection products must not only ensure high yields, but also be safe for the environment and cost effective. The use of pesticides on beans for sanitary and hygienic requirements is possible only in the first growing season before the onset of beans formation, and it is during this period that the harmful activity of the cotton bollworm begins. One of the techniques is a microbiological method of combating cotton bollworm on beans, the widespread use of which ensures the maximum reduction in yield losses while maintaining the high quality of products and eliminating the toxic effect on warm-blooded animals. Protection of plants from pests and diseases with biological products based on the bacterium *Bacillus thuringiensis* is one of the topical areas of pest control in various climatic conditions using microbiological methods.

Human and useful entomofauna, as well as environmental pollution. Currently, entomopathogenic bacterial preparations are produced based on various variants of the crystalline bacillus *Bacillus thuringiensis*. The advantages of the microbiological method are both in the possibility of preventing pests and in their safety for humans, warm-blooded animals and the environment (5).

In the Belarusian Botanical Garden, 90% of the nectar died within 1 hour when using the biological product entox against aphids, beans and peas (6).

Due to the harmlessness of the drug to humans and the effectiveness in the fight against cotton bollworms on beans, the use of microbiological drugs is promising in Central Asia for environmental protection in densely populated areas. Our republic has several different climatic zones, differing from each other in climatic conditions. In this regard, the use of Helitec biological product against cotton bollworm on beans developed by SIBIMEX GROUP LLC is of great interest for Uzbekistan and the entire Asian region.

Over the past two centuries, entomopathogenic microorganisms, as causative agents of infectious insect diseases, have increasingly attracted the attention of scientists and specialists around the world. Interest in these organisms has especially increased in recent years in connection with the prospects of using them to combat harmful insects.

MATERIALS AND RESEARCH TECHNIQUES

Helitec is a microbiological preparation produced in the form of a liquid suspension; the initial titer is 5×10^{12} . Biological product developed by SIBIMEX GROUP LLC. Recommended for use in the fight against leaf-

eating insects of agricultural crops. Field trials to determine the effectiveness of biological and chemical preparations were carried out on the basis of the following guidelines: Guidelines for testing biological products to protect plants from pests, diseases and weeds (1), Guidelines for the use and testing of biological products for protecting agricultural crops (2), guidelines for testing insecticides, biologically active substances and fungicides (3) and Test methods for toxicity and efficacy of insecticides (4).

In 2019-2020, production tests of a biological product in the fight against cotton scoops on beans were carried out in the Andijan region of the Markhamat and Andijan regions. Experiments were carried out in June against the first generation cotton bollworm. The experiments were carried out in three replicates, the activity was determined against the first generation cotton-worm. When studying the effectiveness of the biological product Helitec in the fight against the cotton-worm when spraying, we proceeded from the biology of the pest. The caterpillars of the young and middle-aged cotton bollworm, against which biological treatment is mainly directed, are located in the upper and peripheral parts of the bush, feeding on the parenchyma of young leaves and crawling to young beans.

Spraying of beans crops was carried out using tractor equipment OBX-600 with a working fluid flow rate of 300 l / ha. The fields were selected during the period of mass hatching of the pest. Control fields were not treated with the preparation. The number of pests in the experimental and control fields was determined by examining 100 bean plants. In each replication, 20 samples were taken from 5 plants. The plants in the samples were carefully examined, and the number of eggs and

caterpillars of the cotton bollworm was counted. The pest count was carried out in the following days: the first (preliminary one day) before treatment and then on days 3, 7 and 14 after treatment. Technical efficiency calculations were carried out according to the Abbott formula.

EXPERIENCE SCHEME

1. Control (without treatment) - 1.0 ha
2. Spraying beans with the chemical Entovant, 15% eq. At the rate of 0.45 l / ha (reference) Area under test 1.0 ha.
3. Spraying beans with biological product BetaPro at a rate of 320 g / ha. Area under 1.0 hectares (reference)
4. Spraying beans with Helitec at a rate of 0.350 g / ha. Experience area 5.0 hectares
5. Spraying beans with Helitec at a rate of 0.400 g / ha. Experience area 5.0 ha

EXPERIENCE RESULTS

The first experiment on the production evaluation of the biological product Helitec (in the fight against cotton bollworm on beans was carried out in the Markhamat district of Andijan region. The experiment was carried out in June during the appearance of the cotton bollworm of the first generation. The average air temperature during the experiments ranged from 20-24° C, relative air humidity 40-42%, wind speed did not exceed - 1.5 m / sec. Bean variety "Kara Kuz".

The cultivation of cotton crops was carried out in the evening hours. Consequently, the processing time of the beans coincided with the most favorable period for the fight against the specified pest.

The age composition of the populations before treatment was characterized by the following parameters: caterpillars' I-II ages 7.6-11.6

specimens, caterpillars III-IV ages 6.5-15.0 specimens, caterpillars V-VI ages 3.4-5.4 copies.

The results of the experiment on the use of Helitec against the cotton bollworm are presented in Fig. 1. Analyzing the data obtained, it can be said that the use of Helitec at the rate of 0.350 l / ha on the 7th day after treatment reduced the number of pests by 85.5%, and on the 14th day by 89.5%, then an increase in its rate to 0.400 l / ha on the 7th day

after treatment showed a decrease in the number of pests of 91.8%, and on the 14th day of 96.0%. During this period, the control caterpillars reached an older age and began to pupate. In the reference version, where Entovant was used, 15% e. at the rate of 0.45 l / ha, on 3,7,14 days after the treatment, the efficiency was, respectively, 71.1-89.5-88.0% and the biological preparation Beta Pro at the rate of 320 g / ha, the death rate was respectively 65.2 -82.6-81.8%.

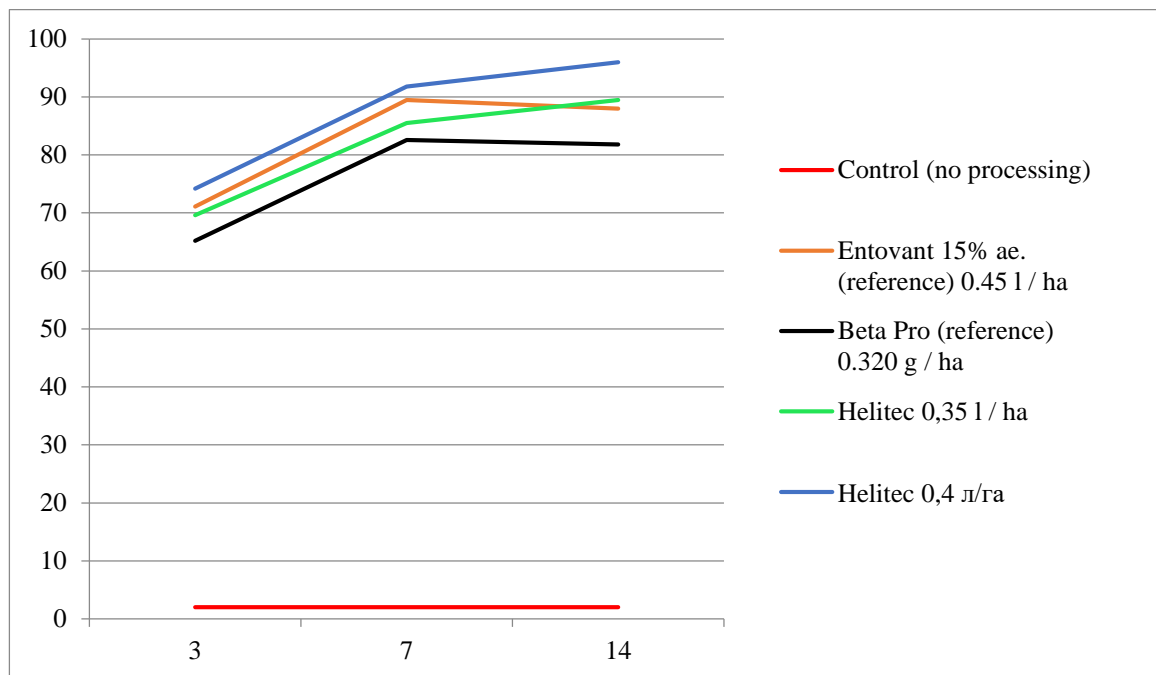


Figure: 1. The effectiveness of the use of the biological product Helitec against the first generation cotton scoop on beans

The second experiment on testing the biological product Helitec was carried out in the Andijan region on beans of the Navruz variety. Spraying of crops was carried out using tractor equipment OBX-600 with a liquid flow rate of 300 l / ha. Treatment was carried out on May 27 in the evening against the first generation of cotton bollworm.

The age composition of the populations before treatment was characterized by the following indices of caterpillars 1-11 ages 4.6-8.0 specimens, caterpillars 111-1U ages 6.3-10.0 specimens, caterpillars U-U1 ages 2.6-6.6 specimens ...

The results of the effectiveness of the drugs are shown in Fig. 2.

The results of the experiment showed that in the experimental variants treated with the biological product Helitec in the norm of 0.350-0.400 l / ha, the efficiency was, respectively, on the 3rd day after treatment, 75.0-81.7%. Comparing the data on effectiveness on days 7 and 14, it should be noted that the obtained

results are high. So, the efficiency of the above mentioned days was respectively 86.6-93.6%; 87.9-93.0%.

In the reference variants, where the chemical Entovant was applied, 15% EC at the rate of 0.45 l / ha and the biological drug Lepidocide at the rate of 1.0 kg / ha, on the 14th death of cotton-worm caterpillars, respectively, was 85.5 - 80.9%.

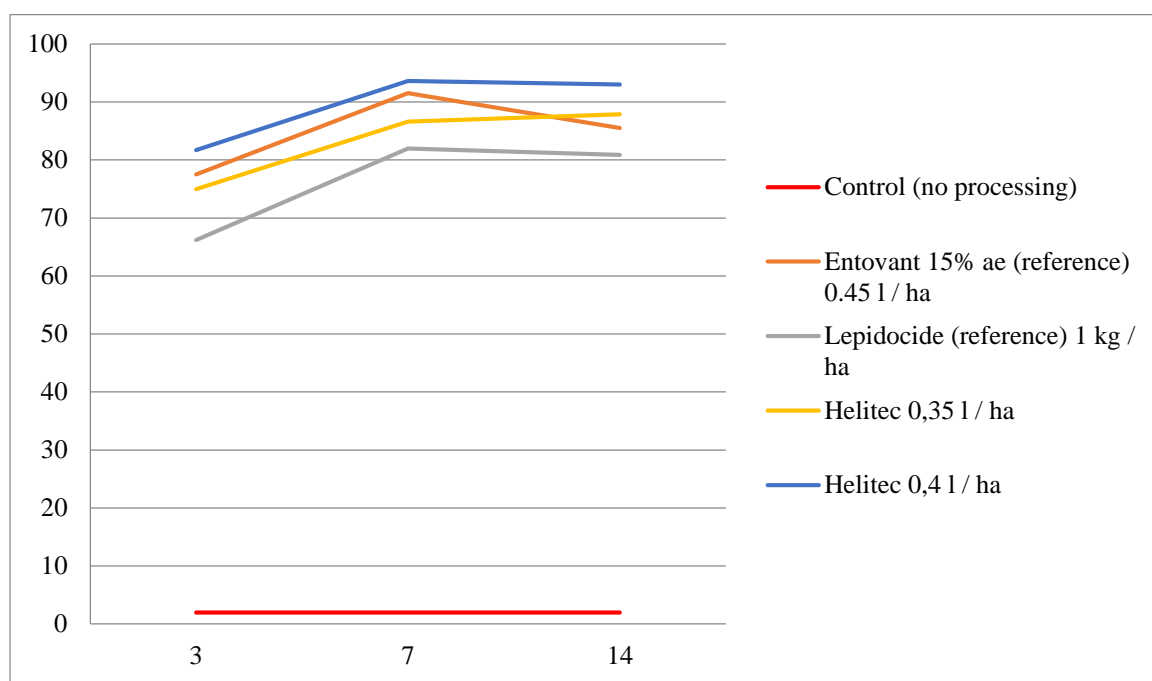


Figure: 2. The effectiveness of the use of the biological product Helitec against the first generation cotton scoop on beans

It is noted that, when using the biological product Helitec, the first symptoms usually appear on the 4th-5th day in the form of a disturbance in the movement of caterpillars, skin turgor is lost, the caterpillars become inactive, react poorly to irritations. The caterpillars remaining on the experimental

fields were far behind in growth and development.

Based on the studies carried out in two farms in two districts of the Andijan region in 2019-2020, we believe that the use of the biological product HELITEC contributes to a sharp decrease in the number of cotton bollworms

on beans and does not have a harmful effect on the environment, beneficial entomofauna, warm-blooded animals and humans.

CONCLUSION

The use of Helitec (liquid suspension) at a rate of 0.350-0.400 l / ha consumption per 300 l / ha of liquid during ground spraying reduces the number of cottonworm caterpillars on beans by 96.0-93.0%, and does not have a harmful effect on the environment, useful entomofauna, warm-blooded animals and humans.

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