



## Article

# "ITAMEC 1.8% Em.K" in Cotton Plant Determination of Biological Effectiveness of Acaricide Against Tetranychus Urticae Pest

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**Abstract:** Cotton is a crucial crop globally, particularly in Uzbekistan, where its high-quality fibers hold a significant market position. However, cotton faces threats from pests, notably *Tetranychus urticae*, which can cause up to 40% crop loss if not controlled during the germination period. Despite the use of various agrotechnical measures, effective pest management remains a challenge. This study investigates the acaricide ITAMEC 1.8% em.c. as a control measure against *Tetranychus urticae*. Field trials were conducted to evaluate the application rates, test results, and biological effectiveness of the drug. Findings suggest that ITAMEC 1.8% em.c. provides significant pest control, offering potential improvements in cotton yield and pest management strategies.

**Keywords:** Cotton, Acaricide, *Tetranychus urticae*, Koch, Biological efficiency, Cotton fiber.

## 1. Introduction

It is known that fighting against harmful organisms is one of the main factors in obtaining abundant and high-quality crops from agricultural crops today. According to the information provided by the FAO organization under the UN, every year 30% of agricultural and food products are destroyed by various pests, diseases and weeds. -35% is being lost. The climate of our republic is highly variable (continental). In addition, in most cases, due to the warm winter, harmful organisms survive the winter almost without damage, and sometimes due to the early arrival of spring 10-15 days, as the plants wake up early, pests also begin to appear accordingly [1].

In recent years, due to global climate change, environmental changes have been taking place in our region as well, for example, the air is often dry and dusty in our Republic. It should be considered that such negative environmental conditions are very favorable conditions for the development and spread of certain pests, in particular *tetranychus urticae*. In our republic, cotton is an important strategic crop that ensures the stable development of our national economy [2]. Every year, more than 1 million hectares of cotton are planted in our country and more than 3 million tons of cotton are grown. In order to achieve such a high goal, it is always important to study and fight against the extremely dangerous pest of cotton - *tetranychus urticae*.

Common *tetranychus urticae*, which is one of the acid-sucking pests of cotton, belongs to the *tetranychus urticae* family, is an arthropod type of invertebrates, and is widely distributed and has a high level of economic damage. *Tetranychus urticae* settles on the back of the cotton leaf [3]. Gray *Tetranychus* wraps the leaf with thin filaments and damages it. The oral apparatus of the mite is adapted for sucking. Damaged leaves appear as a brown or reddish spot on the upper side, severely damaged leaves fall off. If cotton

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infected with *Tetranychus urticae* is not treated in June, 30-50% of the crop may be lost. *Tetranychus urticae* is a serious pest of cotton and feeds on 248 plant species. 37 types of them are agricultural crops. *Tetranychus urticae* lays 160-600 eggs. In Uzbekistan, it gives up to 18-20 generations [4].

Antidote for *Tetranychus urticae* is extracted from 3-4-day-old eggs of the entomophagus of the golden eye in the ratio of 1:10, 1:20 2 times with an interval of 10 days. 500-1000 goldfish eggs will be released to the necessary areas; spraying 20-30 kg/ha of sulfur powder from sulfur preparations that are harmless to the environment and beneficial insects, spraying 300 liters per hectare of 0.5-1 sulfur calcareous solution gives a good effect [5]. Among the worst pests of cotton, *Tetranychus urticae* ranks high in terms of damage. Despite the thorough study of this pest and the development of measures to combat it, their continuous improvement is required.

## 2. Materials and Methods

Production tests of Itamec 1.8% em.k drug were conducted on Namangan-77 varieties of cotton in the experimental fields of the Fergana Branch of the Scientific Research Institute of Plant Quarantine and Protection in Baghdad District of Fergana Region [6]. Spraying was carried out at the stage of the formation of 3-4 leaves of cotton, in the morning at a temperature of 30°C. In this case, Itamec 1.8% em.c. We used 0.3-0.4 liters of abamectin 1.8% em.k preparation for the sample in 0.5 liters of consumption, the control option was not treated (table-1).

Table 1. Experience system

| №  | Options                         | Consumption rate l/ha |
|----|---------------------------------|-----------------------|
| 1. | Itamec 1,8 % em.k               | 0,3                   |
| 2. | Itamec 1,8 % em.k               | 0,4                   |
| 3. | Abamektin 1,8 % em.k (template) | 0,5                   |
| 4. | Nazorat (defenseless)           | Not processed         |

The experiments were conducted according to the existing methodology (Methodical instructions..., 2004) and the biological efficiency was calculated using the Abbott formula [7]. (Abbot,1925)

$$C = \frac{Ab - Ba}{Ab} \times 100$$

That is;

C- biological efficiency %,

A – the number of pests in the experimental plot before the drug was sprayed,

a – after spraying the drug;

B – the number of pests in the control plot before the drug was sprayed;

b– after spraying the drug.

## 3. Results

In the third ten days of May this year, a sharp increase in air temperature led to a natural increase in the number of *tetranychus urticae* in cotton. The number of *tetranychus urticae* in the controlled plants was calculated on the 3rd, 7th, 14th, and 21st days of the observation period [8].

As can be seen from the table, the acaricide Itamec 1.8% em.k has approximately the same toxicological potential as the dosage variant - Abamectin 1.8g/l. The biological efficiency on the days mentioned in the sample variant was 42.6% on the third day, 88.2%

on the seventh day, 94.6% on the fourteenth day, and 96.5% on the twenty-first day. (table-2)

Table 2. In cotton, Itamec 1.8% em.c. biological efficacy of acaricide against tetranychus urticae

| №  | Options                 |                  | Consumption rate of the drug l/ha | The number of mites on each infected leaf, in units |                                   |      |      |      | Efficiency, % to days: |      |      |      |
|----|-------------------------|------------------|-----------------------------------|---|-----------------------------------|------|------|------|------------------------|------|------|------|
|    |                         |                  |                                   | Until spraying medicine                             | For days after spraying the drug: |      |      |      | 3                      | 7    | 14   | 21   |
|    |                         |                  |                                   |   | 3                                 | 7    | 14   | 21   |                        |      |      |      |
| 1. | Itamec 1,8% em.k.       | Abamectin 18 g/l | 0,3                               | 19,4  | 16,4                              | 9,8  | 2,8  | 0,7  | 30,8                   | 65,1 | 89,3 | 95,2 |
|    |                         |                  | 0,4                               | 18,8  | 13,9                              | 3,6  | 0,6  | 0,6  | 39,5                   | 86,7 | 97,6 | 95,7 |
| 2  | Abamectin 1,8% em.k     | Abamectin 18 g/l | 0,5                               | 19,3  | 13,6                              | 3,3  | 1,4  | 0,5  | 42,6                   | 88,2 | 94,6 | 96,5 |
| 3. | Control (not processed) | -                | -                                 | 19,8  | 24,2                              | 28,7 | 26,7 | 14,8 | -                      | -    | -    | -    |

In the first experiment, when the test drug was used at a consumption rate of 0.3 l/ha, the biological efficiency was 30.8% on the third day, 65.1% on the seventh day [9]. 89.3% on the fourteenth day. and on the twenty first day 95.2% result achieved. In the second experiment, the biological efficiency was 39.5% on the third day, 86.7% on the seventh day, and 86.7% on the fourteenth day. 97.6%, on the twenty-first day it was 95.7%. According to the results of this test, we recommend consumption rates of 0.3-0.4 l/ha of Itamec 1.8% em.k. to the results of this test, we recommend consumption rates of 0.3-0.4 l/ha of Itamec 1.8% em.k [10].

In this research of agROTOXICOLOGY, we have set the main goal of finding the optimal sub-standards of drug consumption and creating the most effective ways of their use, i.e. duration and methods. in addition, in order to recommend the use of chemical preparations, the biological efficiency of the tested chemical preparation must be higher than 95 percent.

#### 4. Discussion

The main purpose of using this chemical preparation is to achieve the maximum destruction of the pest *Tetranychus urticae* without affecting the growth and development of cotton during the growing season. This is of great importance in the initial period of plant development, when the pest is significantly ahead of it and can delay its development. The first signs of the effect of Itamec 1.8% drug are observed 7-, 14-, 21- days after the treatment of the harmful organism *Tetranychus urticae*. Pests settle on the back of the leaf and absorb plant nutrients through the back veins of the leaf and weaken the plant, and the color of the leaves becomes red-yellow [11].

The monitoring results are presented in the table. They show that the drug Itamec 1.8% at the consumption level has an effective effect mainly on the growth points of the harmful organism of cotton *Tetranychus urticae* and reduces their number to an almost imperceptible amount [12]. This can also be seen in the calculations made on the 14th day after acaricide application to cotton crops.

The biological efficiency of Itamec 1.8% acaricide shows an average of 3 counts in the experiment [13]. The table also shows the effect of Itamec 1.8% acaricide, Itamec 1.8% acaricide, 2.0 l/ha has a good effect against *Tetranychus urticae* pest, but it should be noted that Itamec 1.8% preparation, at the tested consumption rates, against *Tetranychus urticae* pest It should be included in the "List of drugs allowed in the Republic of Uzbekistan" at the consumption rate of 2.0 l/ha [14].

## 5. Conclusion

Based on the results of the conducted experiment, the following conclusions can be given to the production: "Itamec 1.8% em.k. 95.2-97.6% biological efficiency was achieved in our variants of acaricides used at consumption rates of 0.3-0.4 l/ha against tetranychus urticae, which causes severe damage in cotton fields. Based on the results of the experiment, we can conclude that Itamec 1.8% em.c. in our variants, which used the drug at consumption rates of 0.3-0.4 l/ha, high biological efficiency was achieved against the tetranychus urticae pest in cotton fields, therefore, this chemical drug is used against the tetranychus urticae pest of the cotton plant we recommend using it in affected areas at the suggested consumption rates.

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