

PROTECTION OF PLANTS SOWN AFTER CEREALS IN THE FERGANA VALLEY

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Abstract. *The following crops are mainly planted in the Fergana valley regions on vacant lands: corn (40.6%), white (black) sorghum and broom (13%), vegetable crops, potatoes, cabbage, root crops, legumes, etc. Among them, especially corn has a special place as a crop that will "collect" the cotton crop next year. In 2019, Ghoza tunnel gave 4 stages (generations) in its development, different from previous years. Since there were rainy days in spring and early summer (lower air temperature, higher humidity), the first generation, which usually hatches in early spring, was not observed. The butterfly flight begins in May and lays the first eggs on early cotton and other susceptible crops. When conducting biological control against bollworm in the corn field by determining effective control periods with the help of pheromone traps, by the 9th day: 35.8% from trichogram distributed twice, or 39.3% from trichogram distributed once, or bracon from trichogram (2 times) When used (1 time) - 50.0% biological effect was obtained. In order to achieve chemical protection of the maize crop from the cotton bollworm, a scheme of planting low-growing plants as an intercrop was tested (40 rows of maize + 8 rows of low-growing crops).*

Keywords: *vegetable crops, potatoes, cabbage, root crops, corn, eggs, butterfly, traps, cotton bollworm, bracon, trichogram.*

Introduction

Intercropping became widespread, especially after the widespread adoption of the cotton-cereal rotation system. Grain occupies 70-80% of the area compared to cotton. After this grain is harvested in June, the land is cleared. In order to use these lands effectively, farmers and private farms plant a second crop in such places. These crops are diverse, among which the most widely cultivated are corn belonging to the genus Sorghum, sorghum (white and black sorghum), technical (broom) sorghum, and others. Less- sunflower, peanut and vegetable crops are planted. It is known that the second chance occurred after 1992-1993, due to the sharp increase in the area of grain planting [1].

That is, the grain crops matured relatively early, and the harvest was completed in May-June, which gave an opportunity to plant a substitute (second) crop later. As such crops: various vegetable plants; legumes and root crops can be planted. But the main ones are varieties of early corn (*Zea mays* L.) intended for silage, hay, or grain, as well as white and black sorghum (*Sorghum vulgare* Pers.), broom corn (*S. technicum* Roshev.), and groundnut (*Arachis hupogaea* L.) varieties are considered. These crops have a relatively short season and can be harvested from July to September-October-November [2].

Each of the crops mentioned above is damaged by certain complex pests. But among them, the most serious and omnivorous are: spider mites, aphids, thrips, autumn caterpillars and cotton caterpillars. These, in turn, pose a great threat to the cotton that can be planted in these fields next year. In other words, replacement crops can act as a pest center for cotton and other plants.

Different methods can be used to protect tall oats. Among them, the chemical method has a special place. But there is a difficulty in using this method: the tractor cannot go around; handheld device performance is low. Therefore, it is necessary to create and implement a special planting system. In this regard, scientific research was carried out and high results were obtained [3].

Materials and methods. Three generations of bollworm can develop in cotton. The first generation is often small in number (weak), and can be successfully fought against by placing a trichogram based on the information of pheromone traps. It is difficult to find a field with a sufficient number of worms to test chemical drugs, for this there should be a field with 10-15 worms per 100 types of cotton [4]. The 2nd generation of cotton hopper usually develops in June. This month, its amount is large, and its damage will be particularly strong. Therefore, it is appropriate to put agrotechnological experiments against this generation of bollworm [5,6].

In field selection, pheromone traps should be widely used. A field with an average of more than 15 butterflies per FT per night may also harbor pest eggs and larvae. Field experiments are carried out when butterflies of each generation of the pest have started laying eggs and hatching worms, and there are mostly 1-2-year-old worms in the field. The number of worms should not be less than 10-15 per 100 plants as mentioned above. Sometimes the bollworm causes the complete disappearance of identified cotton species. When making chikanka by hand, it is necessary to take out the field and bury the ends of the cut branches. According to observations, this event causes the loss of 40-55% of cotton bollworm eggs and young larvae. Researches were conducted in Andijan, Baliqchi and Izboskan district farms of Fergana Valley. Experience in Andijan region, M. Yusuf Khan was held at f/x. An experiment was carried out from July to October on 16 hectares of old irrigated fertile soil free from grain. Among the crops: corn, corn, broom corn and black or oil-producing varieties of sunflower were planted. Every 24 rows of crops were interspersed with 8 rows of low-growing late-ripening crops (beets, beets, carrots, and turnips). The agrotechnical measures required by each of the crops were carried out on time.

Entomological observations were carried out every 5-10 days in the fields, and chemical treatments were carried out with the help of OVX-28 sprayer 3 times with water consumption of 250-300 l/ha.

Results. In Andijan region, grain is usually harvested in June, depending on the wheat varieties and seasonal weather. Part of the vacant land is plowed and left to rest until autumn. In about half, a second harvest is obtained by planting various crops for the needs of the farmer and private household. Such crops can be of various types, but in the conditions of the Valley regions, corn, as well as white or black sorghum and technical sorghum (broom) from among the sorghums are often grown. About 30-40% of the land is planted with evening vegetables, turnips, potatoes, cabbage and other crops. Almost all of these crops can be damaged by certain pests. All of these are damaged by insects such as root gnawing blueworms, mealybugs, mealybugs; fruit-eating beetles and various beetles damage it [7,9].

Here we want to talk about corn and other corn crops, which occupy most of the vacant land and become a nest of insects that damage cotton in the future. In addition to providing a nutritious and abundant crop for livestock, corn is affected by various pests, some of which are specialized insects (corn borer-leucania, corn stem moth), and others are omnivores, especially spider mites (*Tetranychus urticae*) and cotton borers (bottleworm). – *Helicoverpa armigera* is virulent [10].

The first 2 hashoart reproduce by giving 3 generations per year. In some fields, and in some years in unprotected fields, there is not a single whole ear of corn left. Productivity decreases and becomes poor quality. Spider mites are more likely to damage imported hybrid maize. Since the plant is tall, it is not protected, the damage is great; the part that remains in the village poses a great threat to the next year's cotton. The cotton bollworm prefers corn rather than cotton. It gives 1-1.5 generations in corn starting from July, but at this time it pollutes the corn in the fields and reduces its quantity and quality. It is clear from the research that if 1 worm infects a field, the average yield will decrease by 5.3%, that is, 318 kg of yield will be lost from a field with 60 tons of corn per hectare. The other side of the matter is also important, that is, usually, the field planted with corn is not protected from pests. Therefore, in the field of corn planted for grain, there is a large amount of overwintering stock of cotton lint. These, in turn, can cause great damage to the cotton planted in the area next year. Therefore, with a sense of responsibility, it is required to protect corn and other corn-like crops from leukani borer, corn stem borer and cotton borer. We started scientific research in this regard in 2018.

Purpose of work: To study the types of pests of corn and other corn crops, their damage and lifestyle. Identify effective systems and means of combating the main pests. The researches were conducted in 2018 and 2019 at the Magir Yusufkhan farm in the Izboskan district of the Andijan region on an area of 10 hectares. Research is conducted based on accepted methods. In 2018, a general control system based on biological control was tested with the help of trichogramma and Bracon beetles in order to protect corn planted on 3 hectares of land freed from grain. The experiment consists of 3 options: 1. protection by distributing only the trichogram 3 times, 2. distribution of Bracon's compound 2 times in addition to the trichogram, 3. control, i.e., a layer without protection. The experiment was carried out against the leuka and the 2nd generations of cotton bollworms.

Table 1. Efficacy of biological protection of corn against leucania and cotton bollworm nd.reg., Izboskan district, Magir Yusufkhan f/x, 2019

| № | Biological defense options | Terms and criteria for distribution of Kushandas gr\ha. piece \ha | Biological efficiency (in relation to worm density), % days after treatment: | | | |
|---|----------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|------|------|------|
| | | | 1 | 2 | 3 | 4 |
| 1 | Trichogram distributed 3times | 15.VII-0.8 gr\ha 20. VII-1.0 25. VII-0.8 | Against the Leukania tunnel | | | |
| | | | 11.3 | 24.8 | 32.7 | 36.1 |
| | | | Against the cotton tunnel | | | |
| | | | 17.2 | 26.1 | 29.1 | 31.2 |
| 2 | In addition to the trichogram, bracon is applied 2 times | 28. VII-700\ha 1. VIII-1000 \ha | Against the Leukania tunne | | | |
| | | | 13.4 | 26.9 | 41.4 | 46.2 |
| | | | Against the cotton tunnel | | | |
| | | | 29.5 | 37.7 | 56.2 | 64.7 |
| 3 | Control unprotected | - | Damage to 100 plants, % | | | |
| | | | 1. Against the Leukania tunnel | | | |
| | | | 14 | 37 | 69 | 75 |
| | | | 2. Against the cotton tunnel | | | |
| | | | 3 | 14 | 17 | 29 |

As can be seen in the table, 3 doses of Trichogramma compound against leuka nevus did not show more than 36% effectiveness. A relatively low (46.2%) effect was also obtained in the option of controlling trichogramma and brakon in a row. The reason for this was revealed by a special experiment conducted in laboratory conditions. 40 females were taken from each tunlam and offered to the poachers. During five days, 87.9% of the cotton tunlam and 26.5% of the leucania were paralyzed. According to the morpho-physiological signs, which are not known to us, the bracon does not like the worms of Leukania tunnel. Therefore, this method cannot be expected to be sufficiently effective against leucania.

In the biological fight against the cotton bollworm, trichogramma -31.2%, and in the variant with brakon, 64.7% biological effectiveness was achieved. Chemical protection of sorghum-like plants from pests faces certain difficulties: if the plants are up to 1 meter high, it is possible to spray them with OVX-28, but the tractor cannot penetrate the taller plants (even up to 2-2.5 m). The fight against blackflies indicates the need to spray insecticides at different stages of plant development.

This is until the corn reaches 1 mg; when the plants begin to produce sultanas and buds and during the period of formation of stems. To carry out these processes, a system of planting protected plants in a special order was proposed. According to this procedure, after every 32 rows of corn, 8 rows of low crops (carrot, radish, cabbage, etc.) are planted. When the opportunity comes, the OVX-28, driven in a low-height cultivator, sprays the working liquid on both sides (16 rows-8.6 m) and provides effective protection.

In 2019, the corn planted in this order was treated with insecticides against leucas, corn stem borer and cotton borer.

Corn borer damage and economic damage criterion (IZMM) For GT, corn is a welcome food source. It is known from many experiments that this insect prefers corn to cotton when food plants are offered for some G'T (Larchenko, 1968; Khodjaev, 1973; 1990). Therefore, there are those who recommend planting this plant as a crop that attracts GT. But, attraction the question of how to destroy it there has not been resolved. The damage caused by G'T to Makkah, as well as the criterion of the amount of economic damage (IZMM) have not been determined. This indicator is one of the necessary targets in agROTOXICOLOGY, which means that when the density of the pest reaches the level at which chemical protection not only justifies itself, but also gives some benefit. IZMM of G'T was performed through theoretical calculations.

1. Maize was planted in a 60x20-1 pattern in 60 cm rows. The theoretical number of seedlings is 83,000 per hectare

2. If it is known that there is an average of 90,000 pieces of sorghum on each hectare of land, if each hectare yields 60 grams of grain: $90\ 000 \times 60\ \text{gr} = 54\ 000\ \text{gr} = 5400\ \text{kg} = 54\ \text{ts/ha}$ In control (54 ts yield per hectare of protected maize)

3. If 1 worm damages each 1 seed (5 g), from each hectare $90,000 \times 5\ \text{gr} = 450\ \text{kg} = 4.5\ \text{ts/ha}$ may yield loss.

4. In accordance with the current prices, maintaining the corn yield in Uzbekistan at 120-170 kg/ha can justify the cost of protecting it. Every 1 p.m. can occur in the presence of an average of 1.5-2 worms in the soil ($16.600\ \text{p.m.} \times 10\ \text{gr} = 166\ \text{kg}$ of grain). $166\ \text{kg} \times 500\ \text{soums/kg} = 83.000\ \text{soums}$. So, if the corn is affected only by G'T, it should be protected every 1 p.m. it is advisable to carry out when there are on average 1.5-2.0 or more worms in the field (IZMM).

Development, damage and IZMM of Leucani tundra in Angiz-planted corn

It is possible that corn can be damaged by several species of Leuca tunlam. Among them, *Mythimna album* L. is more common. These pests are increasing in Uzbekistan. It can be found in all Andijan regions, starting from the southern. Among them, *Mythimna album* L. is more common. These pests are increasing in Uzbekistan. It can be found in all Andijan regions, starting from the southern Surkhandarya region, Tashkent, Syrdarya, Jizakh, Kashkadarya and other regions. Since the research was conducted in Andijan and Andijan regions, information on the distribution and density of Leukani tunnels in these areas was provided. In it, the degree of damage to corn by the II and III generations of Leukani tunlanums and corn damage is listed. The following conclusions can be drawn from the obtained results.

In both regions, corn was damaged by leukani mites and the damage was high.

Comparing regions, it is noted that in Bagdad and Rishton farms of Andijan region, corn is affected by this insect. Even on September 28-30, all plants were infected (stem, leaf, stalk), and it was noted that there were 2-10 worms in every 1 stalk.

Under these conditions, the yield and quality of maize was greatly damaged.

Harmfulness level of leukani tunnel

No one has identified the damage of Leukani tunlam and IZMM, and this work is considered urgent, because it is known that if it is not controlled, a large part of the crop (grains and stalks) can die. That is why we took the first step in this direction and achieved certain results in the reporting year. The research was carried out in a small field experiment in the Izboskan district farm of Andijan region. For this, a part of the uniformly developed "Uzbekistan-305 AMV" variety of corn was taken.

There, in different developmental phases (periods) of the plants, the leukani tunlanum worm (1-2 years old) was artificially released at the rate of 1 per 1 plant.

Later, entomological and vegetation observations were carried out there, and productivity (stem and grain) was determined.

Table 2. Infestation of corn in Andijan and Andijan regional farms by leukani tunlami in 2018 Field observations, 2018

| Region | District and farm | Returns | Plant damage and density | Which generation | |
|---------|--------------------------------------|---------|--------------------------|------------------|----------|
| | | | | II | III |
| | | | | 15-17.08 | 27-30.09 |
| Andijan | Izboskan district. M. Yusuf Khan f/x | I | Damage,% *) | 17.2 | 38.9 |
| | | | Density,% **) | 11.4 | 31.4 |
| | | II | Damage | 22.8 | 44.3 |
| | | | Density | 18.1 | 40.2 |
| Andijan | Bagdad district.Kokan t/p | | Damage | 74.1 | 100 |
| | | | Density | 61.6 | 100 |
| | Rishton district. I. Mamatov f/x | | Damage | 59.2 | 91.7 |
| | | | Density | 47.3 | 84.8 |

*) – How many of every 100 plants are infected, %

***) – How many of every 100 seeds are damaged %



Figure 1. Against the Leukania tunne



Figure 2. Another type of leukani tunnel. It mainly damages stems and leaves



Figure 3. Leucani tunnel worm in corn stew



Figure 4. *Leukani tunlami* corn stalk (a), damage to the stem (b); v - dome

The results are presented in Table 3. As it can be seen from there, the damage caused by *Leuka tunlami* to corn depends on the phase (period) of the plant that it starts to damage, the earlier it is, the higher. Although this idea is not new, it shows how unfortunate it is to miss the time to protect the plant from these pests.

Thus, if the leukaemia worm damages a newly growing plant, it is impossible to expect a harvest from such a plant - the stem itself, due to its damage (appendices, Fig. 8), usually stops growing and dries up or sends out a new branch from below (damage - 85%); one cannot hope for a grain harvest. If the plants are affected by leukaemia during the period when they grow up and begin to release the top sultan, mainly the stem, leaves and partly the sultan and the developing canes are also affected. In this case, the total damage will be slightly reduced: blue stem can be reduced by 46.4%, and grain by 61%. In this case, the reduction of grain occurs not only due to the damage of the grain in the cobs, but also due to damage to the stem to the plant in the period of the formation of pods causes even lower damage: blue stem - 37.5%, and grain - 27.9%, and finally, if the plant is damaged during the development of pods and the grain begins to harden, leukaemia tundra partially feeds on grain. But since the bran and grain become inconvenient for nutrition, the worm moves to the soft stem and spoils the normal physiological taste of the bran. As a result, the quality of grain deteriorates. Damage: 14.5% to blue stem and 4.5% to grain. Based on the above-mentioned, the criterion of the amount of economic damage was created according to the damage caused by leukaemia mites in corn. It is variable depending on the phase in which the pest attacked the plant. Plants- 5% to 12% damage requires fighting against it.

Conclusions

1. In Andijan region, in 2018, 76.5 thousand hectares of land were planted with crops that can be replanted, of which 27.3 thousand hectares (35.7%) were corn, 13.2% were sorghum (white and black), 27.4% were various vegetable and root crops and others occupied.

2. Cotton bollworm, (G'T), leucani bollworm and corn stem borer indicate that they are serious enemies of sorghum crops. In addition to these, the cotton bollworm has shown that it is an insect that multiplies and increases its stock in other crops such as sunflowers, peanuts, and leguminous crops, pumpkins.

3. It was determined that it is necessary to protect the corn planted in the valley in the valley region by 2 treatments against G'T. The first - in the second half of August, the second - in the first half of September

4. At the current prices, protection of the corn crop in Uzbekistan is related to saving 120-170 kg of grain per hectare, and only then will it justify itself and provide additional income. This means that every 1 p.m. it can happen if there are 1.5-2 worms on average in the plants (5) (16,600 p.m. x 10 gr = 166 kg of grain); 166 kg x 500 soums/kg = 83,000 soums. So, if the corn is damaged only by the cotton bollworm, it should be protected every 1 p.m. it is advisable to carry out when there are on average 1.5-2.0 or more worms in the field (IZMM).

5. If the plants are damaged by this insect during the period when the plants grow and start to produce crowns, the total damage is slightly reduced: the blue stem is reduced by 46.4%, and the grain is reduced by 61%. Grain loss occurs directly due to damage to the grain in the pods and damage to the stem. If the stalks are damaged during the "dumbul" period, the damage of leukani tunnel is even lower: the blue stem is reduced by 37.5%, and the grain is reduced by 27.9%. In case of attack of leukani worms in corn stalks during the ripening period, the stalk and the soft part of the stalk are damaged more: the blue stem is reduced by 14.5%, and the grain is reduced by 4.5%.

Based on the above, the IZMM for leukani tunmalum in corn depends on the period of the plant when it starts to damage, and it is desirable that the chemical treatments are as follows

a) In the period when the plant has produced 5-6 leaves - if damage by nightshade exceeds 5%,

b) During the "sultan" release period of the plant - if it exceeds 6%,

c) When the grain in the husks begins to harden - if it exceeds 11-12%.

6. The intercropping method, which makes it possible to protect corn with the help of land equipment, proved itself to be viable.

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