Agrotechnological protection of cotton from sucking pests in various ways of planting

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Abstract. Today, cotton is grown in 97 countries, a total of 34.675 million. China produces 21.7 percent of the world's cotton, 21.1 percent belong to India, 17.6 percent belong to the United States, 9.8 percent belong to Brazil, and 7.2 percent belong to Pakistan. One of the main factors of obtaining a high and quality harvest in the cultivation of agricultural products is the protection of plants from pests, diseases and weeds. For this purpose, it is necessary to organize and manage properly agricultural plant protection measures. In the conditions of the regions of the Fergana Valley, mainly sucking pests cause severe damage.

1 Introduction

In the era of climate change, the full study of the bioecology of sucking pests and the development of countermeasures are considered an urgent topic. Taking this into account, we studied the sucking pests of the Fergana Valley in different climatic conditions in 2018-2022. Depending on the dynamics of the development of aphids, 60-70% biological effect was obtained when the golden-eye lichen was distributed.

There are many arthropods that feed on cotton. Their number exceeds 700 worldwide, including more than 214 in the Central Asian region [1]. However, the number of species whose practical damage can be felt does not exceed 15 [2]. They can be divided into the group of suckers and rodents according to their nutrition, and the pests that can be especially damaging during the germination period: aphids (Aphidinea subfamily), thrips (Thripidae family) and autumn beetles (Noctuidae family) have a special place. Then: spider mite (Tetranychus urticae Koch.), spider mites (trialeurodes and Bemisia genera), moths (Miridae - family of mirids) and cotton tunlami - bollworm (Noctuidae family of butterflies).

The study of terrestrial entomofauna is closely related to agriculture. Phytophages and their damage in agrobiocenosis pose a serious threat to the yield and quality of crops. As a result, it seriously damages the quality and productivity of the produced products. At the same time, it is observed that many problems increase from year to year during cultivation, directly affecting the cost of products.

According to scientific studies, 30-35% of agricultural crops die under the influence of harmful organisms. In addition to the decrease in productivity, the quality of the crop changes in a negative way, as a result of lice taking out part of the food they have absorbed from

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sucking pests without digesting it, plant leaves, stem and fruit elements become sticky. Therefore, methods of combating damage to the bioecology of aphids were developed.

2 Research materials and methods

In counting the sucking pests in cotton, it was determined by counting the pests in one boll of cotton when the cotton sprouted, and in 3 infected bolls after cotton picking. Therefore, it is appropriate to put agrotechnological experiments against this generation of bollworm [3]. An experiment was carried out from March to November on 16 hectares of land with old irrigated fertile soil free from grain [4]. An experiment was conducted on the Gozani Andijan-36 variety.In cotton, entomological observations were carried out every 5-10 days, and when necessary, chemical treatments were carried out with the help of an OVX-28 sprayer 3 times with a water consumption of 250-300 l/ha [5].

3 Research results

Plant aphids belong to the subfamily Aphidinea of the order Homoptera. Cotton is damaged by several types of lice. There are 3 types of bollworms: alfalfa oralfalfa bollworms or cotton and large bollworms, which cause serious damage to cotton. Cotton sap sucks the sap from the growth point and leaves of the plant, delays its growth for up to 2 weeks, weakens the cotton. Cotton leaves twist, change color, fall off, the stem becomes crooked, forks are formed, no buds are formed on the lower branches.

In the fall, when cotton lice (polysis or cotton bollworms and large bollworms) multiply, the sap they secrete contaminates the cotton fiber and makes it sticky and causes the development of fungi. As a result, the quality of the fiber deteriorates and it becomes difficult to process it. Cotton aphids are found in wingless and winged forms. The better the conditions for aphids (the air is moist and cool), the more wingless they are. As the conditions worsen (when the weather is dry and hot), they spread their wings and move to another crop.

Aphids are small sucking insects, the body is egg-shaped, oval, sometimes elongated or hemispherical, and the length is from 0.5 mm to 6-7.5 mm. The body may be convex or slightly flat on the upper side. The body of nymphs is not oval, most of them tend to be triangular, flattened towards the shoulder-belly. In this respect, the nymphs are very similar to the body shape of the pear honeyeater. The body of aphids is covered with thin, delicate chitin, which secretes waxy foam or fluffy fibers.

In particular, plant sap occupies a special place among sucking insects that damage cotton. Cotton aphids are insects that belong to the family of arthropods. Cotton feeds on several types of plant sap. Among them, large cotton sap, acacia or alfalfa sap, and Plotnikov sap are more common. The large cotton aphid overwinters in the egg state on mulberry, bitter brain, red brain and other weeds. They are larger than other aphids, their body length is 3-4 mm, their whiskers are longer than 4.5 mm. Aphid tubes are very long 1.7mm to drop, reducing yields by up to 40%. During the growing season of the cotton plant, the metabolism, which occurs as a result of sucking plant sap, slows down the processes of photosynthesis, which causes a certain decrease in productivity. Using the sap-sucking oral apparatus, it pierces cotton leaves and branches and feeds on cell sap. Because the insect absorbs a lot of cell sap relative to its mass, a certain part of this liquid is excreted as a sticky sugary substance without being digested. When such substances are released in large quantities, they stick cotton fibers together and reduce the quality of the fiber.

3.1 Aphids

Three types of aphids can damage cotton. These include alfalfa, or acacia aphid, psyllium, or cotton aphid and large cotton aphid large cotton aphids begin to damage [6], the Poliz aphid is the most important in cotton in terms of damage. In addition to air temperature and humidity, the length of the light day is also important in its development, according to O. Mamatkarimov [7] showed. A lot of work has been done on the harmfulness of aphids. In general, the harmfulness of aphids depends on many factors: it depends on the season of the plant, its density, nutritional capacity of the aphid, and the condition of the plant.

3.2 Thrips

Usually, there is an expression that one species of thrips (Thrips tabaci Lind.) damages cotton , Weeds and plants with aphids are of great importance in the development of this pest. Damage by thrips on cotton plants of different varieties may vary. In this case, the hardness of plant leaves or the chemical structure of tissues can be important. Thrips have no specific prey, but they serve as food for omnivorous predators. All insecticides used against aphids can be effective against thrips, Favorable conditions have been created for the growth of tobacco thrips, which also damages them. This requires the creation of new measures to protect cotton from this pest [8].

Studying the laws of changes in the amount of cotton juice in the cotton plant is one of the main issues of agricultural workers. When such a method is implemented, it is possible to develop measures to prevent the mass reproduction of aphids.

It is one of the most necessary factors to study the damage of cotton planted in different order and thickness of seedlings by harmful insects and spider mites, because on the one hand, a specific microclimate is formed around the plant planted in different thicknesses, which can have a special effect on the development of pests, and on the other hand, it is accepted for each pest indicators of the economically harmful quantity criterion (IZMM) can be defined differently.

Among the arthropods that form the basis of cotton agrobiocenosis, we are talking about aphids, thrips, spider mites, autumn and cotton mites.

3.3 Development of aphids

In the conditions of the regions of the Fergana Valley, the main one of them is the polyz (cotton) aphid - Aphis gossypi. Usually, during the season, it develops strongly in May-June and undergoes summer depression for 40-50 days. From the middle of August, it increases its development again, and from the middle of October, it prepares for the winter. According to the development of aphids with such a change, light is the reason for the lengthening and shortening of the day.

Our research was mainly carried out in our small (2018) and large (2019) field experiments conducted in 2018-2019. In 2018, the following was found out from the aphid damage to cotton planted in different arrangements and seedling thicknesses in 6 options.

1. Cotton planted with a row spacing of 90 cm is more affected by sap compared to a row spacing of 60 cm, and its density is higher.

2. Cotton planted between both rows is affected by aphids and its density increases disproportionately as the seedling thickness increases.
3. Cotton was not defoliated in the fall in a small field experiment. In these conditions, aphids developed until the 1st-2nd day of October. Some of the opened cotton was infected with gum disease.

In a large field experiment, defoliation was carried out on September 12 (magnesium chlorate - 13 kg/ha). As a result, the development of aphids in cotton was drastically reduced. But after magnesium chlorate, the cotton partially turned blue again. This caused the aphids to begin to develop again and the unpicked fiber to stick

Table 1. Seasonal development of aphids in cotton planted at different thicknesses. Andijan vil., Izboskan district, planted by hand in the usual way in 2019.

Options (seedling thickness, theoretical		**Planted in 60 cm rows (15.IV)**						**Planted in 90 cm rows (15.IV)**					
		110 thousand 60x15-1		**138 thousand 60x12-1**		**166 минг 60x10-1**		**111 thousand 90x15-1.5**		**139 thousand 90x8-1**		**167 thousand 90x10-1.5**	
Size		% *	density **	% *	density **	% *	density **	% *	density **	% *	density **	% *	density **
May	I	0	0	0	0	0	0	10	3	7	4	11	9.5
	II	1	0.2	2	1.3	7	5.5	22	7.8	14	9.8	29	23.1
	III	5	2.2	7	4,6	0	8.9	40	27	44	38.7	47	53.7
June	I	10	7.6	14	32.4	18	37.1	86	180	90	201	80	228
	II	22	35.4	32	44.8	47	69.7	90	300	95	345	96	338
	III	15	27.1	24	29.5	30	41	30	40	33	55.8	44	58.1
July	I	5	12.1	6	10.1	9	13.1	12	5.3	14	6.7	15	9.9
	II	0	0	0	0	1	0.4	4	7.2	5	8.8	8	10
	III	0	0	0	0	0	0	2	3	3	4.2	2	5.3
August	I	1	0.7	0	0	0	0	1	2	2	3.3	2	3
	II	14	22.1	7	15.8	11	27.3	3	7	5	8.9	8	13.2
	III	21	38.1	19	27.1	24	38.9	10	17	12	22.5	15	32
Septem ber	I	31	40	33	45.8	36	53	18	48	20	68.8	22	87
	II	35	53	55	57.1	45	69.1	30	79	38	86	41	114
	III	41	53	61	78.1	58	77.1	54	101	76	112	74	132
October	I	48	69.9	67	80.4	64	93.7	60	116	77	178	84	191
	II	-	-	-	-	-	-	73	129	85	190	87	200
	III	-	-	-	-	-	-	-	-	-	-	-	-
Total		249	361.5	327	427	360	534.8	545	1073.3	620	1344	665	1508.2
%		100	100	131	118.2	144.5	147.9	100	100	114	125.2	122	140.5

* - how many of every 100 plants are affected on average
** - the average number of pests on 10 infected leaves, pcs
Added: Har var. 240 (60 cm) and 180 (90 cm) m2
240 m2x3=720 m2 in 3 returns; 180m2x3=540m2

In our large field experiment conducted in 2019, the results obtained in previous years were also returned. This year, cotton planted in 90 cm rows also had more aphids, and the increase in seedling density led to an increase in the number of infected plants and aphid density. Protection against aphids in cotton by aphids, and the increase in seedling density led to an increase in the number of infected plants and aphid density. Protection against

aphids in cotton by insecticide treatment, according to the existing regulations, depends on the damage of the plants with the II score, that is, the formation of aphid colonies (clusters) on 25-30% of the plants. The condition here is that if there are more than 200 active forms of fungi in each 100 plants during these periods, the treatment is abandoned, otherwise - it is carried out. Development of thrips. Because thrips are winged insects, they spread quickly. The importance of thrips increased especially after the introduction of the cotton-wheat" rotation system. The reason is tobacco after the grain begins to ripen and after the harvest thrips fly to surrounding crops. In particular, cotton is additionally affected and suffers more damage. In our small and large experiments conducted in 2018 and 2019, the development of thrips was studied along with aphids. From our experience with 6 variants in small plots and from our large field experience, the following has become clear.

1. The development and density of thrips does not depend on the row spacing of cotton.
2. As the thickness of seedlings increases from 110 thousand bush/ha, the density and damage of plants by thrips increases. For example, if we consider 100% thrips present in 110,000 bushels of cotton per hectare planted in 60-cm rows, the number of thrips-infested plants in 138.000 bushels is 32%, and the density is .4%; and in 166,000 bushels, it increased by 151 and 33%, respectively.

4 Conclusion

In our studies on sucking pests, the non-wide branching cotton variety "Andijan-36" was planted in rows of 90 cm, 111-139-167 thousand bushes per hectare (theoretical), or in the fall, when planted as 106-131-159 thousand bushes, 60 cm compared to the control options, an additional yield of 3.3-3.6 tons per hectare is created. In general, the thickness of the seedling is both: 60 and 90 cm, the yield in the variants varied from 110 to 167 thousand in cotton planted in rows increases. However, the optimal economic efficiency and profitability is achieved in the option with the number of seedlings per hectare of 130 thousand bushes.

Planting method: Cotton planted at 90 cm is more severely damaged by aphids, and its density increases.Aphid damage and density of cotton planted between both rows (60 and 90 cm) increases disproportionally as the seedling thickness increases. The earlier the defoliation is carried out, the more exposed cotton fibers are saved from the "gluing" disease.

The development and density of thrips does not depend on the row spacing of cotton. But as the seedling thickness increases, the level of thrips damage and its density increases. The conducted defoliation sharply reduces the influence of thrips in cotton and negatively affects its density in the next year.

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