

# Species Composition and Damage Quantity Criteria of Agrobiotic Pests of Maize (*Zea Mays* L.) in Karakalpakstan

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**Abstract** The article presents the types of rodent and sucking pests that develop and cause damage in the maize crop in Karakalpakstan, their bio ecological development features, the damage caused by each species, and the types of predators and parasites that are active in reducing the number of pests. Also, scientific research is given about the importance of a preventive method against aphids.

**Keywords** Rodent, Sucker, Entomophagus, Predator, Parasite, Quantitative criterion of economic damage (QCED), Agrobiocenosis, Biotope, Biological method, Bio ecology

## 1. Introduction

The role of maize crops grown by our farmers is of great importance in providing the population with food products, raw materials for production and quality fodder in animal husbandry. But in the conditions of our Republic, the amount of crops grown by farms is decreasing. One of the main reasons for this is the salinization of the soil due to the fall of toxic salts rising from the bottom of the Aral Sea and the damage caused by plant pests during the growing season.

In the scientific research work of Karakalpakstan scientists, three factors affect the salinity of the soil: the first is the rise of underground water to the upper layer due to excessive watering of crops and evaporation, leaving salts in the soil; (per year 30-75 million tons) is increasing the salinity of the land as a result of falling on the cultivated fields, and the third is the reduction of the harvest due to the damage caused by harmful organisms (plant pests, plant disease-causing microorganisms and weeds) that develop and cause damage in plants.

According to the information of the professor Sh.T. Khojaev of the Scientific Research Institute of Plant Protection of Uzbekistan [10; p. 292-293], Turkistan armyworms (*Agriotes meticulosus* Cand.), autumn caterpillars (*Agrotis segetum* Den. et Schiff.), cotton caterpillars in the corn crop (*Heliothis armigera* Hb.), maize stem borer (*Sesamia cretica* Led.), maize borer (*Ostrinia nubilalis* Hb.),

leucani borer (*Leucaniavittellina* Hb.), and corn aphids (*Rhopalosiphum maidis* Fitch.) have been found to cause significant damage.

Therefore, according to the results of scientific research carried out by the scientists of the Republic, it was determined that 20-30 percent of the harvested crop dies every year, despite the use of advanced agrotechnics in agricultural crops and the implementation of measures to combat plant pests. Toreniyazov [6; 48-68-B], Toreniyazov, Utepbergenov, Eshmuratov [7; 118-122-B] Toreniyazov, Khojaev, Kholmurodov [8; 596-606-B].

Uzbek scientists H.K. Kimsanboev, B.A. Sulaymonov, A.R. Anorboev and others. [1; 38-45-B] according to scientific data, in addition to pests, their entomophages meet in the maize crop and make a great contribution to reducing the number of pests.

## 2. Experimental Methods

The calculation of pests in the experiment is based on F.M. Uspensky's [9; 1973] method of determining the number of pests in crops; the method of determining the number of entomophages V.A. Shapiro, V.A. Shepetelnikova [2; 16-s] conduct field experiments Sh. Nurmatov, Q. Mirzajonov, Avliyokulov A. and others. (1986) methods.

## 3. Experimental Results

In the implementation of the sequential application of integrated control measures against pests of agricultural

crops, it is necessary to determine the species composition of pests in crop species, their morphology, biological and ecological development stages, and the distribution of each pest species in the crop fields during the growing season, as well as the density in terms of number.

As a result of the conducted research, it was found that several types of pests are spread in the corn biogenesis grown by farms in the Karakalpakstan region. In any region, depending on the natural climatic conditions, types of pests that are economized on biotopes develop. Therefore, the types of rodent and sucking pests found in the maize crop in the region were studied.

As a result, the development of 7 types of rodent pests during the growth period of the maize crop was determined. Among them, the development of wireworms, common calf's head, fall armyworm, cotton armyworm, caradrina, corn stem armyworm and leucanian armyworm, as well as the sucking pests of corn aphid were taken into account.

Among the 7 types of rodent pests mentioned above, it was found that the autumn borer, cotton borer, caradrina and maize stem borer, and maize borer are the dominant species, which develop in corn and cause great damage. Especially in corn fields planted after wheat, the development of 2-3 worms per 1 plant was determined.

As it can be seen in the table, if wireworms, autumn nymphs and leukani nymphs are encountered in small quantities, then autumn nymphs, cotton nymphs, caradrina, maize stem nymphs and maize nymphs develop in large numbers and damage the plant.

Fall nightshade falls on the maizecrop after the cotton in the young seedling period of the plant and causes thinning of the shoots as a result of gnawing on the root horn.

The cotton bollworm appears in the maize field from the time of ripening of the plant, and especially during the ripening period of the fruits, it gnaws the grains and causes great damage.

As a result of the conducted control works, it was found that the maize aphid is one of the dominant species in the maizeagrocenosis and is a very dangerous pest.

It is necessary to determine the number of the pest in the biotope in the field for effective control measures against the maize aphid in the maize crop. Therefore, in our next experiment, directional control work was carried out on farms in the territory of Chimbay, Kungrad and Beruni districts, and the dynamics of the development of aphids was studied. In this, the time of appearance of aphids and their development in the fields of corn crops of the farm was controlled.

Aphids fall into the corn crop from the 2nd and 3rd decade of July, spread their larvae to the plants by live birth, develop and reproduce.

During our experiment, the dynamics of the development of corn sap in the corn agrobiocenosis was studied.

During the growth period of the plant, the corn aphid develops and multiplies in the corn crop, and their average number per plant is 64-98 in the 3rd decade of July, in August, despite the high air temperature, it is 156-284 per

plant, and in September, the number of pests is on average one. increased from 326 to 458 units in the maize plant.

So, as can be seen from the above scientific data, in the agricultural conditions of Karakalpakstan, 5 types of rodent pests develop in the maize crop, of which 3 types, i.e., the autumn moth, the cotton moth and the maize stem butterfly, are the predominant species, and the period of major damage to the crop is May-June, and maize aphid in July-August, it multiplies and causes great damage.

Also, during the conducted scientific experiment, the species composition of entomophages found in corn pests, their density in the plant, and the characteristics of bioecological development were controlled. As a result, the presence of Trichogramma, bracon parasites and golden eye predator in rodent pest species, and several types of natural entomophages in aphid colonies was determined. Among the observed entomophages, predatory and parasitic species were considered.

Among them, predators include 7-spotted ladybird beetles and their larvae, larvae of the common goldeneye, larvae of the syrphid fly, and adults and larvae of the predatory mite. Development of trichogramma, bracon and aphidiids from parasitic entomophages was determined.

Ladybug beetles and their larvae meet a lot in aphids, feed on aphids and control the number of pests.

Larvae of the syrphid fly are specialized entomophages of aphids and feed exclusively on aphids. They can be found in abundance in clusters of aphids.

Predatory mite adults and larvae cling to the aphid body or wings and feed by gnawing on the body. But they are very few and hard to find.

Larvae of the golden-eyed entomophagus are very active and feed on the eggs and larvae of several types of pests. That is, it actively participates in reducing their number by feeding on aphids, spider mites, thrips and other pests with the eggs of autumn nightworms, young worms.

**Quantitative criterion of economic damage of maize aphid in maize crop (QCED).** As a result of the conducted scientific experiments, it was found that the types of pests of autumn moth, cotton moth, corn stalk butterfly and corn aphid develop in the corn crop and cause damage.

In the first year of the experiment, lysimeters were used in order to determine the extent of damage caused by aphids in the maize crop. The size of each lysimeter is 1 m<sup>2</sup>. In each lysimeter, 10, 20, 30, 40 and 50 pieces of maize aphid were distributed according to the development phases of the plant (3-4 leaves, flowering, fruiting phases), and the increase and damage of the aphids were controlled. The template option was not distributed. The experiment was carried out in 4 repetitions.

As a result, in our experiment, along with plant pests, the level of damage caused by aphids decreased due to the activity of natural entomophages, especially the hornworm, syrphid fly, and golden-eyed predators. However, in the period of 3-4 leaves of the plant, when sap was distributed from 10 plants, the average damage caused by the pest in 1 infected plant was 12.0 percent. 14.0 in the proportional type

when aphid falls from 20, 30, 40 and 50 pieces; 18.4; Making 20.2 and 22.6 percent, it was found that the plant is susceptible to the pest in the period of young germination. During the flowering period of the plant, 16.6 percent of the crop died.

During the fruiting period of the plant, as the height of the plant increased and the number of leaves increased, the damage of aphids was less. That is, it was damaged by 12.0 percent.

As it can be seen from the results of the conducted experiment, it was found that the sooner the aphids fall on the plant, that is, during the young germination period of the plant, the less harmful it is compared to the earlier stages of development.

During our experiment, the economic damage criterion of aphids was carried out on the basis of the formula for determining the economic damage criterion of high-yielding crops using the method of V.I. Tanskiy (1981 year).

According to the obtained data, the damage of a small number of aphids during the young germination period of the plant (on average 50 pieces per 1 infected plant) is very large, and the permissible amount of 3 percent for the death of the crop in the corn station is caused by a small number of pests. When the pest enters the crop late, that is, in the fruiting phase, the criterion of economic damage caused by the pest is 30.0 for 1 infected plant, respectively; 40.0; 50.0 units, these indicators are the QCED (quantitative criterion of economic damage) of corn aphid, and these indicators indicate that aphid control methods should be used to save the crop.

So, if there is no entomophagus in the plant affected by the pest, if aphids have fallen in the number indicated above, this means that the aphids will multiply in a short time.

In our next experiment, against the first generation of aphids that came out of the village in early spring, taking into account their development in the weeds at the edges of the field, we used a preventive method to prevent the spread of aphids in the field, that is, we released 500-1000 pieces of golden entomophagus per hectare. it was found that 56-60 percent of aphids died, and the rest were delayed for 20 days.

Therefore, we can reduce not only aphids, but also the number of other pests by ensuring more attraction of entomophages in the fields and by releasing 500-100 pieces per hectare of golden-eyed predator grown in additional biolaboratories to the edges of the field where the pest has fallen.

## 4. Conclusions

As a result of the carried out scientific research, we came to the following conclusion on the species composition of pests, the period of their exit from the countryside, their spread to the maize crop, the dynamics of development during the growing season, and the criterion of the amount of economic damage.

1. In the conditions of Karakalpakstan, the following types of pests develop in the maize crop: wireworms, common calf's head, autumn cutworm, cotton cutworm, caradrina, maize stalk butterfly, leukani cutworm, and maize aphids. Among them: cotton bollworm, maize stalk butterfly, caradrina and maize aphids are the dominant species.
2. The release of maize aphids from the village falls on the 2nd and 10th day of April. That is, when the average daily temperature for 5-7 days is 10-15°C, it was found that aphids are released from rural areas.
3. From the 1st and 2nd decade of June, the maize aphid spreads to the maize station and develops and causes damage.
4. The pest of the autumn nightshade develops by causing damage to the corn station from the period of plant germination to the period of ripening.
5. Cotton moth, caradrina and corn stalk moths cause damage from the period of 6-8 true leaves of the corn plant until the ripening period. The degree of damage increases especially during the milk ripening period.
6. Entomophages: trichogramma, bracon, khan's girl, common golden eye, syrphid fly, predatory mite and parasites: aphidids are found in plants affected by rodent and sucking pests, they actively participate in reducing the number of pests.

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