



PROSPECTIVE METHODS OF USING ENTOMOPHAGES IN PROTECTING MAIZE AND SUNFLOWER FROM APHIDS IN THE CONDITIONS OF KARAKALPAKSTAN

Utebergenov Adilbay Reymbaevich¹, Satbaeva Rimma Sarsenbaevna²
Joldasbaev Edilbay Marxabaevich³

¹Candidate of Agricultural Sciences, Associate Professor,
Karakalpakstan Institute of Agriculture and Agrotechnologies

²Doctorate Student, Karakalpakstan Institute of Agriculture and Agrotechnologies

³Doctorate Student, Karakalpakstan Institute of Agriculture and Agrotechnologies

Article DOI: <https://doi.org/10.36713/epra11574>

DOI No: 10.36713/epra11574

ANNOTATION

The article presents the types of aphids that develop and cause damage to maize and sunflower crops in the conditions of Karakalpakstan, the developing type of each species, the period of coming to the field, the damage it causes, and the criterion of economic damage. The biological effectiveness of the natural predator, eaters, and golden-eyed entomophagus cultivated in biolaboratories was determined in controlling aphids, and the technology of using this predator was studied.

KEYWORDS: sucker, pest, entomophagous, predator, eater, biolaboratory, biological efficiency, economic damage criterion, migration.

INTRODUCTION

Maize and sunflower crops grown by our farmers are very important in providing industry with raw materials.

At present, food security and ecologically free crop cultivation remain urgent issues on a global scale. Therefore, we must pay attention to the modernization and diversification of our economy, including the agricultural sector, especially the cultivation of food crops. In the recent four years, 300000 hectares of low-yielding cotton and grain fields were replaced by fruits and vegetables, maize, sunflower and other food crops. Of this, 32000 hectares of intensive gardens, 15000 hectares of vineyards, 2000 hectares of modern greenhouses, 114000 hectares of vegetables and potatoes, 72000 hectares of legumes and oil crops, and 52000 hectares of other crops should be cultivated.

In the scientific data of Sh.T.Khojaev, a famous entomologist in Uzbekistan, [4; 5] from pests in maize, maize aphid (*Sipha maydis* Pass.), oat-maize aphid (*Aphis maydis* Fitch.), large grain aphid (*Macrosiphum avenae* F.) and ordinary grain aphid (*Schizaphis graminum* Rond.) are found. It has been determined that they belong to the order of homoptera and the family of aphids (Aphidoidea). Maize, common grain, and large grain aphids have been reported to overwinter as eggs and enter nonmigratory colony-forming aphids. Of these, only the aphid of the grain enters the sheath of the leaves of the plant and survives. The rest live openly. Aphids are especially more in spring and autumn, and decrease in hot summer days, because high air temperatures cause the destruction of aphids, which also increases the natural number of aphids.

According to the scientific data of E.Sh.Toreniyazov [1], it hibernates in the form of maize aphid (*Sipha maydis* Pass.) and in early spring leaves the hibernation and multiplies in the field. It is especially active in spring and autumn. The affected plant will lag behind in growth.

E.Sh.Toreniyazov, A.R.Utepbergenov, A.T.Zayrova [2], E.Sh.Toreniyazov, A.R.Utepbergenov, E.G.Eshmuratov [3] found in their scientific experiments that the application of the golden eyed entomophage to control aphids in maize has a high biological effect.

In solving the above-mentioned problems, filling the table of the population with ecologically free products without letting the cultivated crops die, taking into account the characteristics of the specific external environmental factors of the region and the peculiarities of the bioecological development of pests, fully studying the methods of combating them, the technology of their application, more than 98 percent of the used method it is required to ensure the achievement of biological efficiency.

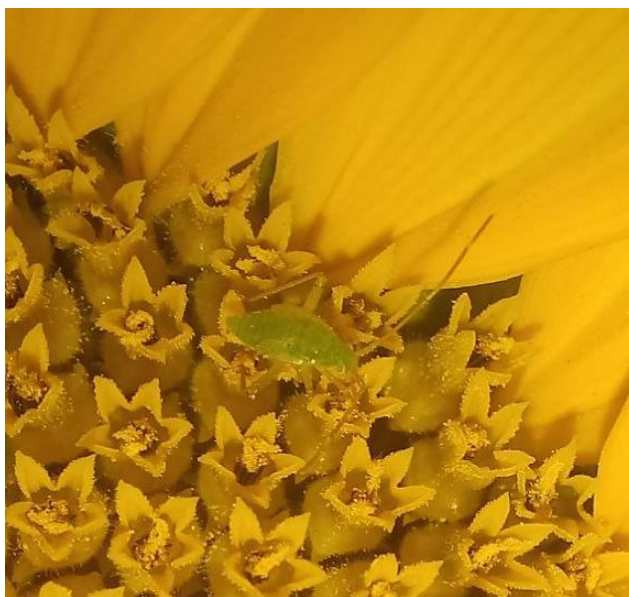
RESULTS OF THE RESEARCH

In the conditions of Karakalpakstan in 2021-2022, in order to determine the types of aphids that develop in maize and sunflower agrobiocenoses, in the fields of Kungrad, Beruni, Chimbay and Nukus districts, directional control works were carried out at maize and sunflower stations every 10 days. As a result of the control work, the development of maize aphid in the maize station and the development of cucurbits crops aphid in the sunflower crop was revealed. The average density of maize (*Sipha maidis* Pass.) aphids, cucurbits crops aphid (*Aphis gossypii* Glov.) aphids increased from 22 to 185 units per 1 infected plant.

In our conducted experiment, the development dynamics of maize aphid in maize agrobiocenosis was studied. That is, 3 aphids per 1 plant in the 1st option; in the 2nd option, 6 aphids were distributed and in the 3rd option, 10 aphids were distributed, an entomological bag made of cloth was put on it, and the development and reproduction of the aphids was monitored for 20 days. Due to the absence of natural entomophages in entomological small gardens, aphids multiplied very quickly, after 20 days the number of aphids in the 1st option increased to 40, in the 2nd option to 85 and in the 3rd option to 187 (Pictures 1-2).



Picture-1. Development of maize aphid on leaf and stem of sunflower



Picture-2. The development of cucurbits crops aphid in the basket of the sunflower

During our experiment, the economic damage caused by aphids during the development period of maize and sunflower was studied. During the flowering and fruiting periods of maize plants in entomological small gardens, 10 maize aphids were distributed to 1 leaf in small garden, and 10 cucurbits crops aphids were distributed to 1 leaf in sunflower, and the increase in the number and damage of the pest was studied. As a result, in our experiment on maize, the weight of grain in 2 cobs in 1 plant was 247 g. In the 1st variant of the experiment, 47 g less yield was obtained in the affected maize. This is 19 percent. In the 2nd option, 21.5 percent and in the 3rd option, 23.8 percent less yield was obtained.

So, it can be seen that the rate of aphid damage during the flowering and fruiting period of the plant is 19, 21.5 and 23.8 percent when 3, 6 and 10 aphids fall on 1 leaf of the plant.

In our experiment, the types of natural predators and eaters found in a swarm of aphids were determined, and their density in the field was studied. As a result, the 7-point type of the ladybug, larvae of the syrphid fly, golden-eyed larvae are found in all types of aphids, and their number is on average 0.5-1.5 per 1 infected plant.

In order to reduce the damage of maize aphid in the maize agrobiocenosis, an additional golden eye predator was used to natural entomophages, and its biological efficiency was determined (Table 1).

Table 1
Biological effectiveness of the golden eye predator in controlling the maize aphid

Number	Variants	Average number of pests in 1 damaged leaf, piece	Biological efficiency, %, in days
1	5:1	185	68,4
2	10:1	168	62,6
3	15:1	161	59,2
4	Control	175	-



As it can be seen from the table, the number of aphids decreased in the options where the golden-eyed predator was used, and in the 1st option, 5:1 ratio (5 aphids : 1 entomophage) achieved 68.4% biological efficiency after 14 days, and in the following options, 62.6 and 59.2%.

CONCLUSION

1. Maize aphid develops in maize agrobiocenosis, and cucurbits crops aphid develops in sunflower agrobiocenosis, causing great damage to the plant.

2. The average number of maize aphids in 1 affected leaf during the growing season of maize is 185 pieces.

3. In the maize and sunflower fields, the natural entomophages of the ladybug, syrphid fly larvae, golden-eye larvae and aphidids are found on the plants affected by maize and cucurbits crops aphids. Their average number in 1 infected plant is 0.2-0.5 pieces.

4. When 3, 6, and 10 pieces of aphids were distributed on 1 leaves covered with entomological bags, after 20 days their number increased to 40, 85, and 187 pieces according to the options.

5. In the agrobiocenosis of maize, the damage of the pest was reduced and the biological efficiency of 68.4 percent was achieved when using the larvae of the golden eye in a ratio of 5:1 in controlling maize aphid.

LIST OF USED LITERATURE

1. Toreniyazov E.Sh. *Protecting plants in an integrated way (textbook)*.-Nukus: Karakalpakstan.-2013.-p. 95-96.
2. Toreniyazov E.Sh., Utepbergenov A.R., Zairova A.T. *Protection of plants*.-Nukus: Knowledge, 2014.-p.62-70.
3. Toreniyazov E.Sh. Utepbergenov A.R., Eshmuratov E.G. *Protection of plants (textbook)*.- Tashkent: Science and technology, 2017.-p.73-74.
4. Khojaev Sh.T. *Modern methods and means of integrated protection of plants from pests*.-Tashkent: Navruz, 2015.-p.220-221.
5. Khojaev Sh.T. *Basics of general and agricultural entomology and the integrated protection system*.-Tashkent: Tashkent: "OOO Yangi Nash" publishing house, 2019.-p. 149-150.