



PROCEDURES FOR CARRYING OUT BIOLOGICAL CONTROL MEASURES AGAINST OWLET MOTHS IN THE POTATO BIOTOPE OF THE AGROBIOCENOSIS OF KARAKALPAKSTAN

Toreniyazov E.Sh.¹, Rozimova A.P.²

¹Doctor of Agricultural Sciences, Professor

²Assistant, Karakalpakstan Institute of Agriculture and Agrotechnologies

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ANNOTATION

The results of the studies conducted on the types, bioecology of pests that cause damage to potato varieties grown in Karakalpakstan and biological control measures against them are presented.

KEY WORDS: *Plant, variety, seedling, harvest, pest, rodents, owlet moths, biology, dynamics, trichogram, biological usefulness.*

JUSTIFICATION OF THE RELEVANCE OF THE TOPIC

Potato (*Solanum tuberosum* L.) is considered one of the agricultural crops in Karakalpakstan, which has been expanding its cultivation area in recent years, measures to increase the potato growing area to 10,000 hectares were determined and orders were given to all districts. The plant type belongs to the tomato-like breed and according to morphological characteristics and differences in biological development it has been determined that early-ripening dosimpalek, zarafshon latona, Belarus, Priekul, average-ripening Condor, Marfona, Umid, Picasso, Sante and late-ripening Diamond, Cardinal varieties will yield up to 40-50 tons per hectare when they are planted in their period and the provided agrotechnical tools are used.

Today, the yield from potato fields is a little low, and in some farms, there are cases of a sharp decrease, and the results of the research conducted in this regard show that the cultivated varieties, applied agrotechnical measures are not organized on the basis of scientific research, and at the same time, the biotope of potatoes is prone to and it is taken into account that the quality and quantity of the harvested crop will be damaged by pests migrating from other stations. That is why, taking into account the changes in the abiotic and biotic factors of the agrobiocenosis of the area, determining the planting dates of potato varieties, application of measures against pests that spread in the field and reduce the quality and quantity of the crop due to the effect of feeding on the generative and vegetative bodies of the plant based on science-based terms and methods is the most urgent issue today. In this regard, it is required to carry out countermeasures on a biological basis using the effects of entomophagous species, which are considered to be the main biotic factors in the field biocenosis.

METHODS USED FOR THE RESEARCH

Methods presented by B.J.Azimov, B.B.Azimov, V.I.Zuev, T.E.Ostonakulov and others were used to obtain a yield from potato varieties planted in different periods. Methods of B.P.Adeshkeevich, Sh.T.Khodzhaev, V.I.Tansky were used to determine the types of pests in the biotope, and to carry out countermeasures to eliminate the level of harm they cause, and B.A.Dospehov's method was used to conduct experiments.

RESULTS OF THE RESEARCH

One of the important signs of the biologically different side of the potato plant, the tubers from the root are used as planting material and as food. The number of vegetative bodies is large, the stem spreads on the surface of the ground or grows vertically, improving the microclimate in the field, due to a number of generative bodies and the effect of better development of flowers, it creates an opportunity for the insects living in the biotope to gather in the field and develop and multiply in favorable conditions. Including early varieties are planted in the second ten days of March, mid-early varieties are planted at the end of May, late varieties are planted until July, the emergence of young seedlings in the field, the harvest of late-planted varieties is preserved in the fields until November, and most types of pests, which are the main elements of the biocenosis that it accumulates in the fields and has an adverse effect on the growth and development of the plant is given in full in the results of the scientific work. (Ostonakulov T.E. et al., 2002; Khodjaev, 2015; Toreniyazov et al. 2018).

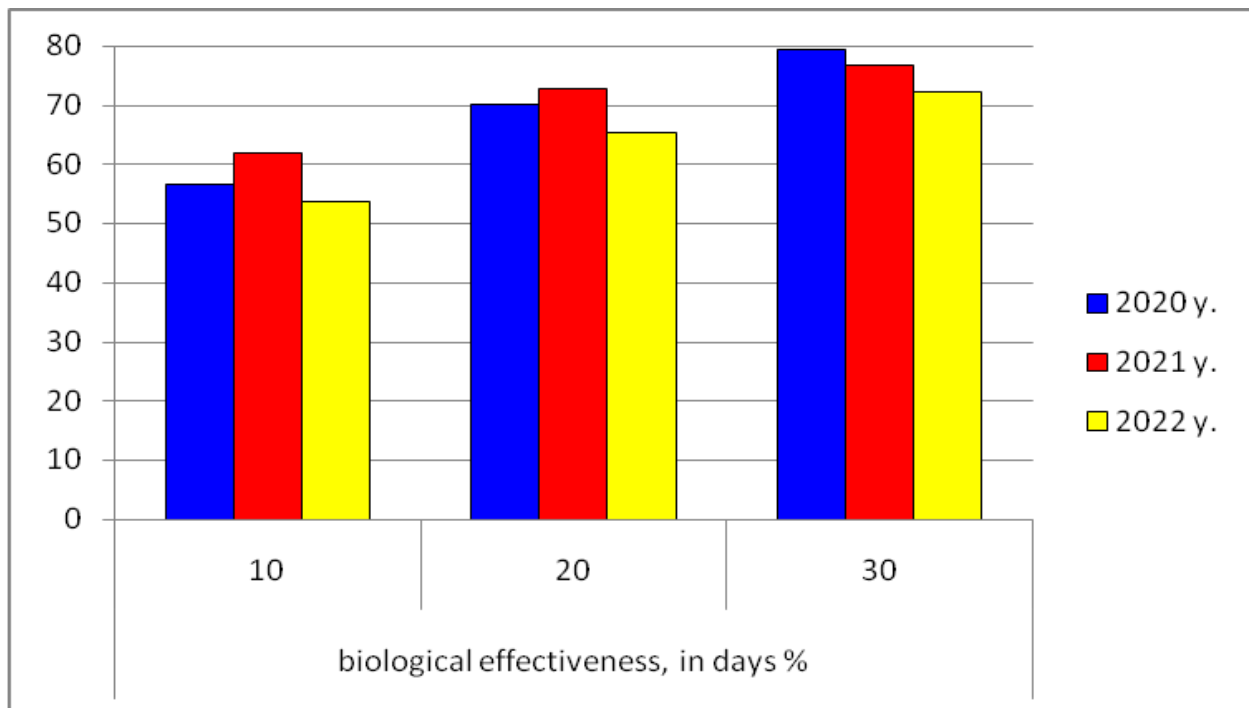
Such research has been continued, taking into account the planting dates of early, medium and late varieties of potatoes of Karakalpakstan agrobiocenosis, the growth of vegetative and generative bodies, as a result of our research conducted in 2020-



2023, the spread of many types of pests in the fields and crops was found to be extremely harmful. Among these types, European mole cricket (*Gryllotalpa gryllotalpa* L.), the wireworm (*Agriotes meticulosus* Cond.), turnip moth (*Agrotis segetum* Dan.), the heart and dart (*Agrotis exclamationsi* L.), the red-head (*Epicauta erythrocephala* Asall.), potato moth (*Phthorimaea operculella* Zel. 1, *Gryllotalpa gryllotalpa* L.), and potato flea beetle (*Psylliodes affinis*) were found to be widespread pests which cause damage. Among the pests, worms of the turnip moth and the heart and dart species were determined to be dangerous species that cuts off the root neck from the sprouting of potatoes until the emergence of 5-7 true leaves, gnaws the stems and leaves, leaving them behind in their growth, reducing the number of plants and causing damage.

When studying the types, morphological signs of the phases, development bioecology, dynamics, and the level of harmfulness of the pest, it was determined that a turnip moth gives a full generation three times, and a heart and dart gives two full generations. During the vegetation period, offspring developed in potato varieties, 5-6-year-old larvae are collected in the fields of late-ripening varieties from September and overwinter on the 15-20 cm surface of the soil. Depending on the rise in air temperature with the arrival of spring, when it constantly exceeds + 5°C, 5 cm of the soil, turning into a cocoon, useful heat is 50°C (the lower limit for the turnip moths is 10°C, for the heart and dart 11°C), when they gather, butterflies fly and lay eggs on young seedlings.

Observations were made by placing pheromone traps of 2 per hectare in order to determine overwintering of pests in the conditions of the northern districts of our Republic. In this way, it was determined through the males falling on the pheromone that the adult offspring of the pest flew out in the second and third ten days of April, and it was taken into account that the laying of eggs started when the plants were checked. In such fields, when the number of eggs of the turnip moths reached 16,3-18,6 per 100 plants, and the type of heart and dart reached 14,9-18,2, *Trichogramma entomophagus*, grown in a biolaboratory using special methods, was distributed at the rate of 200,000 per hectare, and its biological usefulness was determined (Picture 1).

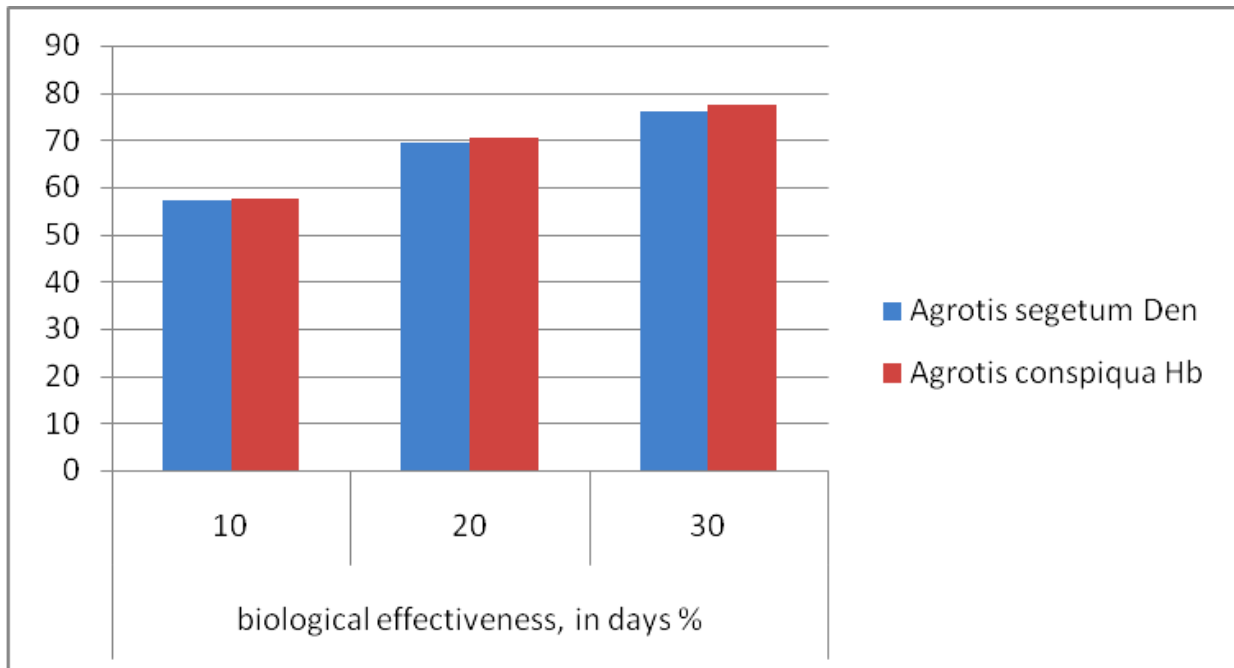


Picture 1. Biological usefulness of *Trichogramma* against the eggs of rodents in potato fields in the agrobiocenosis of Karakalpakstan Shimbay, Nukus districts

Taking into account the fact that the appearance of the eggs of the owl moth is scheduled for some days, and the trichogram host lays eggs on the eggs laid in one day and develops, 60,000 entomophagous for the first time, after 3-4 days, 80,000 in the same field, and after 5-7 days 60,000 were distributed.

The trichogramma grown in the biolaboratory against the eggs of the rodent species spread in potato fields was spread on the basis of the given recommendations, when the number of eggs of the turnip moth in the fields is on average 17.8 per 100 plants, and the biological effectiveness of the biological control measure after 10 days is 57.3%, and after 30 days it was determined that 76, 1% of the pest eggs that appeared in the fields were killed.

Against the heart and dart type, which started to lay eggs in potato fields, it was found that the biological usefulness of trichogramma, distributed when the number of eggs was 15,9, increased from 57,7% to 77,5%, and seedlings were saved from damage.



Picture 2. Biological usefulness of Trichogramma against the eggs of rodents in potato fields in the agrobiocenosis of Karakalpakstan Shimbay, Nukus districts

During the experiments, after trichogramma, which was grown in the bio-laboratory, was spread to the potato fields, in addition to destroying the eggs of the moths, its number gradually increased until the growing season, and it became a beneficial biological factor to keep the number of future pests at a lower level.

CONCLUSION

It was determined that the main reason for the lower than expected yield of the potato varieties planted in the conditions of Karakalpakstan, as a result of the agrotechnical measures used for planting and harvesting in the early, middle and late periods, is the contribution of the pests spread in the biotope. It was found out that among these gnawing species, the species of turnip moth and the heart and dart appear in the stages of sprouting and gnaw young seedlings and leaves, which have an adverse effect on the growth and development of the plant. Taking into account the bioecology of the development of pests in the region, it has been scientifically confirmed that the application of Trichogramma entomophagine, grown in biolaboratories, is one of the most biologically beneficial methods, as soon as they overwinter and begin to develop in the spring months.

RECOMMENDATIONS FOR PRODUCTION

From the time of sprouting of potato seedlings, until harvesting, it is necessary to look at 100 plants (selecting 5 plants from 20 places) diagonally or in a checker pattern every 8-10 days. In order to correctly determine the time of egg-laying of turnip moth and heart and dart butterflies in the field, put 2 pheromone traps per hectare, and carry out daily control tasks. When 2-3 butterflies fall on the pheromone traps every day, it is necessary to apply the method of distribution in three times (60x80x60 thousand pieces) from the trichogramma entomophagus reproduced in the biolaboratory at the rate of 200,000 per hectare.

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