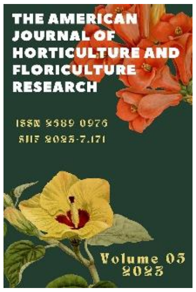
The American Journal of Horticulture and Floriculture Research
(ISSN – 2689-0976)
VOLUME 05 ISSUE 08 Pages: 16-22
SJIF IMPACT FACTOR (2020: 5. 251) (2021: 5. 731) (2022: 6. 19) (2023: 7. 171)
OCLC – 1121086298
Publisher: The USA Journals



Journal Website: https://theamericanjournals.com/index.php/tajhfr

Research Article

BIOLOGICAL EFFECTIVENESS OF MICROBIOLOGICAL AND CHEMICAL PREPARATIONS AGAINST PESTS OF CHERRY ORCHARDS

Submission Date: August 20, 2023, **Accepted Date:** August 25, 2023,
Published Date: August 30, 2023 |
Crossref doi: https://doi.org/10.37547/tajhfr/Volume05Issue08-04

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ABSTRACT

In this article, studies were conducted to determine the effectiveness of microbiological and chemical preparations against harmful organisms found in cherry orchards. When using B.thuringiensis-26 strain against cherry orchard pests, it was found in the research that the efficiency was 40.6% to 43.3% compared to the control option in 3 days, and 86.0% to 86.6% in 14 days.

KEYWORDS

Cherry, pest, entomopathogen, pesticide, biological efficiency, B. thuringiensis.

INTRODUCTION

The year-by-year increase in the demand for food products in the world requires the further expansion of the production of agricultural crops and the constant supply of high-quality food products. In this regard, large-scale work is being carried out in the countries of the world, such as improving the field of fruit growing and expanding the areas of intensive orchards.

Today, 1,569,674.0 tons of cherry fruits are grown in the world, and the country of Turkey takes the main place due to the cultivation of 338,361.0 tons of cherries per year, and the USA also takes the next place by growing 225,073.0 tons of cherry fruits.

Cherry is valued as a valuable fruit plant in many countries of the world [Kolesnikov M.A. 1959], its fruits contain easily digestible sugars, and it provides a valuable parchezbep product of cherries. Cherries grown in Uzbekistan contain 71.5-86.0% water, 8.08-19.32% total sugar, 0.58-2.22% pectin, 0.39-0.76% fiber, 0.72 -32.22 mg/% vitamin C, 0.34-1.70% titratable acidity, 0.55-0.73% ash, etc. [Korobkina Z.V. 1974; Baymetov K.I. and the head. 2004].

In addition, cherries contain 1.2-1.8 mg% iron, 0.15-0.20 mg% manganese, 80-120 µg/% copper, 2.6-3.70 µg/% cobalt, 0, 13-0.55% potassium is also recorded [Korobkina Z.V. and the head. 1968].

In recent years, the volume of cherry cultivation in the world is about 2.0 million tons, and its yield is around 52.9 t/ha. Of this, 88,000 tons of cherries are grown in Russia per year, its yield in this country is around 32,6 tons/ha [www.fao.org].

Since the change of climate conditions is favorable for the growth of harmful insects in cherry orchards, it is observed every year that various pests damage fruit orchards. In some years, as a result of their damage, it was found that the weight and quality of the grown fruits decreased to a certain extent.

In such conditions, it is very important to develop various countermeasures against them. At the same time, chemical insecticides are used as protection against these pests. But traditional methods are not always effective for this pest, and they are also not environmentally safe. Modern technology is required to reduce the amount of chemical pesticides in gardens, to grow environmentally friendly products that meet international standards through biological means. Currently, the use of various pathogenic microorganisms as a control against pests is an effective method. Because these microbiological preparations are safe for crop cultivation and cause diseases only in pests [Anorbaev A.R. and the head. 2018].

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The transmission of harmful insects to diseases caused by microorganisms was first discovered by I.I. Mechnikov in 1879 and described the fungus bacillus salitarius found in diseased larvae of the grain beetle found in the south of Ukraine [Evlakhova A.A. 1974].

Such preparations contain entomopathogenic fungal spores. The mechanism of action of drugs on insects is carried out through the digestive system or cuticle. For fungal preparations, the higher the humidity, the higher the effectiveness [Sharapov V. M. and the head. 1970]. Currently, the use of biopesticides based on entomopathogenic fungi against various pests causing damage in agriculture is of priority, because they are more environmentally friendly than pesticides [Kepler RM et al. 2017]. In terms of the use of microbiological preparations for the protection of plants from harmful organisms in the world, preparations based on Bacillus thuringiensis Berliner (Bt) were found to be in the first place in the world [Sanahuja G. And others. 2001].

Based on the analysis of the above literature, in our research, we tested microbiological and chemical preparations against the pests that cause serious damage in cherry orchards in laboratory and small field experiments.

Materials and research methods (материалы и методы). In the research, observations are made in intensive cherry orchards in Tashkent, Samarkand, Namangan and Fergana regions. Laboratory work is carried out in the "Plant Protection and Quarantine" laboratory of the Research Institute of Horticulture, Viticulture and Winery named after Academician M. Mirzaev.

Laboratory and field experiments were carried out to isolate local disease-causing isolates and strains from cherry pests in laboratory conditions, to study their biological effect, using the following methods: A.A. Evlakhova, O.I. Shvetsova's "Metody raspozvaniya bolezney nasekomyx" (1964), "Bolezni vrednyx nasekomyx" (1965) [Evlakhova A.A. and the head. 1965], Ya. Weiser's "Microbiologicheskie metody borby s vrednymi nasekomymi" [Weiser Ya. 1972], E. Shteinhaus "Microbiologiya nasekomyx", "Patologiya nasekomyx" [Steinhaus E. 1952], "Entomopathogennye griby" by A.A. Evlakhova [Evlakhova A.A. 1974], "Entomopathogenic fungi" by N.Yu. Geshtovt [Geshtovt N.Yu. 2002].

Isolation of pure cultures of entomopathogenic fungi from natural substrates V.I.Bilay and N.Yu.Geshtovt [Bilay V.I. 1977; Geshtovt N.Yu. 2002], their cultivation T.I. Gromovyx [Gromovyx T.I. 1982] and studying the influence of environmental factors on them V.M. Goral [Goral V.M. 1973] was carried out using the methods. N.L. Sevnitskaya and A.O. Sagitov [Sevnitskaya N.L. 2015; Sagitov A.O. 2011] methods were used. G.Ya.Bey-Bienko, S.M.Volkov, N.V.Bondarenko on distribution of cherry and peach pests, calculation of damage and

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collection of samples [Bey-Bienko G.Ya. 1969; Volkov S.M. 1955 ; Bondarenko N.V. 1978] methods were used.

In laboratory and field experiments, it was calculated according to Abbot's formula [Abbott WS 1925].

$$\text{B ef.} = \frac{(\text{Ab} - \text{Ba}) \times 100\%}{\text{Ab}}$$

B ef. - biological efficiency, %

A - is the number of pests before treatment in the experiment;

a - the number of pests after experimental treatment;

B - the number of pests before treatment in control;

b - the number of pests after control treatment;

To calculate economic and economic efficiency of the drug, K.A. Gar et al., [Gar K.A. 1974] was used.

Results and its discussion (результаты и их обсуждение). According to our research and observations in cherry orchards in experimental areas of Samarkand, Fergana and Namangan regions, apple sap - Aphis pomi Deg., garden spider mite - Schizotetranychus pruni., cherry black aphid - Myzus cerasi F ., acacia false shields - Parthenolecanium corni Bouche. and the gnawing cherry fly - Rhagoletis cerasi L . it was found that it is widespread and causes a lot of economic damage. Among these pests, it was found that cherry black weevil - Myzus cerasi F. is widespread in almost all experimental areas (Samarkand, Namangan and Fergana regions) and causes a large amount of damage.

According to the results of the experiment, the B.thuringiensis-26 strain used against the cherry black aphid in cherry orchards was 43.3% effective compared to the control on the 3rd day, and 86.0% on the 14th day. Also, the B. thuringiensis-26 strain used against the garden spider mite was 40.6% and 68.0% biologically effective on days 3 and 7, respectively, and 86.6% on day 14. As a result, 2×10 8 ml against pests of cherry orchards. The strain B. thuringiensis-26 used in the titration achieved the highest biological efficiency against the garden spider mite. In the studies, the biological efficiency of the microbiological preparation was up to 86.6% (table).

table

Biological efficacy of B. thuringiensis-26 strain against cherry black aphid and garden spider mite

(Laboratory experiments, plant quarantine and protection laboratory experiment, 2023 y)

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Options	Average consumption l/ha, kg/ha	The average number of insects per 10 sm stem, pcs					Efficiency, % by days			
		The number of insects before processing	Days after processing							
			3	7	14	21	3	7	14	21
Myzus cerasi F.										
Control	-	19.0	25.3	31.0	38.5	42.6	-	-	-	-
Mospilan 20% n.kuk. (template)	0.03	24.6	10.0	6.3	3.3	9.3	69.6	84.3	93.5	83.0
B.thuringiensis-26 (2×10^{8} units).	0.3	23.3	17.6	12.0	6.6	10.3	43.3	68.5	86.0	80.3
Schizotetranychus pruni.										
Control	-	7.0	8.0	11.3	16.6	23.3				
Mospilan 20% n.kuk. (template)	0.05	11.0	5.3	2.6	1.6	6.0	57.9	85.3	93.7	83.7
B.thuringiensis-26 (2×10^{8} units).	0.3	10.3	7.0	5.3	3.3	8.6	40.6	68.0	86.6	75.0

Mospilan 20% n.kuk as an option against pests. in the case of the application of the insecticide at a rate of 0.03-0.05 l/ha, the efficiency of 57.9% to 69.6% compared to the control was achieved on the 3rd day , and by the 14th day, this indicator was 93.5% to 95.7 made up to %.

CONCLUSIONS

In conclusion According to the results of observation in cherry orchards, apple aphid - Aphis pomi Deg., garden spider mite - Schizotetranychus pruni., cherry black weevil - Myzus cerasi F., acacia false shield - Parthenolecanium corni Bouche. and it was found that the gnawing cherry fly - Rhagoletis cerasi L. is widespread and causes a lot of economic damage. The B.thuringiensis-26 strain used against these pests was proven to be biologically effective on day 3 compared to the control option from 40.6% to 43.3% and on day 14 from 86.0% to 86.6%.

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