

продуктивність кущів сприяють зменшенню урожайності насаджень на 8,60–41,55 % у порівнянні з потенційною та збільшенню виробничої собівартості продукції винограду сорту Ркацители, а також підвищенню показників виробничої собівартості 1 т продукції до 5,0–7,56 грн/кг.

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**EFFECTIVENESS OF THE APPLICATION OF
INSECTICIDE PREPARATIONS AGAINST THE *HYPHANTRIA
CUNEA DRURY***

In Ukraine, the first foci of the fall webworm were discovered in Transcarpathia in 1952, and in June — almost throughout the lowlands of the region. Over the next two years, the pest moved in a northerly direction for 10–15 km, and in the valleys of the Latorytsia, Borzhava, and Tysa rivers, individual foci were found in the depths of the foothills.

In Kharkiv region, the fall webworm was discovered in the early 80s of the twentieth century. According to the State Service of Ukraine for Food Safety and Consumer Protection in 2017 the pest was registered in 24 districts of Kharkiv region, on a total area of 2429.5 hectares. A significant part of the colonized territory refers to household plots – 57.4 %, to the territory of farms of all forms of ownership – 19.2 %, and to other lands – 24.4 % of the foothills.

The mass distribution of the fall webworm at the territory of the region requires a detailed study not only of the biological and morphological peculiarities of the pest but also the search for appropriate measures to identify, localize and eliminate foci. Protection of perennial plantations from the fall webworm is based mainly on extermination measures aimed at the total destruction of the species. However, scientists more and more often recommend the use of an integrated plant protection system against regulated pests. Currently, the use of a chemical method of controlling harmful organisms is the most effective and economically reasonable. However, alternative environmentally friendly pest control methods are being developed to reduce the negative impact on the environment due to

the use of chemical preparations. In our country, the arsenal of microbiological means of protection against leaf beetle pests is quite limited. Researchers note that the use of biological preparations is quite promising in the control of polyphagous pests.

Our research was conducted during 2019-2020 in Kharkiv region (near the village of Malaya Rohan, 49° 56' 19"N, 36° 29' 26"E) using generally accepted methods during the growing season. Experiments were carried out using the following chemical and biological preparations on ash-leaved maple: Nurel D, 55% emulsion concentrate (standard), Koragen, 20% suspension concentrate, Actofit, 0.2% emulsion concentrate, Lepidocide, water-soluble, titer $1.5 \cdot 10^9$ spores/ml, Bitoxibacillin-BTU, tetro preparative mixture, titre $100 \cdot 10^9$ spores/ml. The selection of preparations was carried out according to their purpose and effect on lepidopteran pests and with different active substances. Working solutions were prepared at the rate of 15 liters of the sprayer and used in three versions: spraying caterpillars at the beginning of revival (before the formation of nests), spraying nests with caterpillars of middle instars and spraying caterpillars of older instars. The percentage of dead caterpillars was determined according to generally accepted methods on the 3rd, 7th, and 14th days after the use of preparations. In the control variant, trees were sprayed with clean water.

As a result of the conducted studies, it was found that the most effective in destroying the first generation of caterpillars of the fall webworm of younger instars (L1–L3) is the preparation Koragen, 20 % suspension concentrate, which provides 93.9 % and 93.8 % caterpillar mortality on the 14th day after the use in 2019–2020. The advantage of the preparation is that it has an ovicidal effect. The use of insecticide Nurel D, 55 % emulsion concentrate in 2019 contributed to the destruction of 91.7 % of the caterpillars of the fall webworm of younger instars on the 14th day after spraying, and in 2020 – 83.7 %, which is 8.0 % less. The studied biological preparations Actofit, 0.2 % emulsion concentrate, Lepidocide, water-soluble, titre $1.5 \cdot 10^9$ spores/ml, Bitoxibacillin-BTU, tetro preparative mixture, titre $100 \cdot 10^9$ spores/ml, also contributed to the destruction of the caterpillars of the fall webworm of younger instars at a fairly high level, but their action was somewhat slowed down in time. So on the 14th day, after spraying nests with caterpillars with the biological product Bitoxibacillin-BTU, tetro preparative mixture, titer $100 \cdot 10^9$ spores/ml in 2019, the death rate was 76.1 %, which is 17.8% less than when using the chemical preparation Koragen, 20 % suspension concentrate, and in 2020 – 73.3 %, which is 20.5 % less. Slightly higher effectiveness of action was obtained

when using Actofit, 0.2 % emulsion concentrate, on the 14th day of the study, when using this preparation, the death of 85.3 % of the caterpillars of the fall webworm of younger instars was observed in 2019, and in 2020 – 82.7 %.

The most effective preparation in the killing of younger instar caterpillars (L₁–L₃) of the second generation in 2019 and 2020 was also the preparation Koragen 20 % suspension concentrate, which ensured the mortality of caterpillars on the 14th day after the use (92.6 % and 91.0 %, respectively). Insecticide Nurel D, 55 % emulsion concentrate compared to the previous preparation was less effective — 87.2 % (2019) and 80.0 % (2020). Biological preparations in 2019–2020 also showed significant effectiveness against caterpillars of both younger and middle instars on the 14th day.

In 2019-2020, the use of preparations of different origins against the first and second generation of the fall webworm caterpillars of the middle instars (L₄–L₅) contributes to their death at a later time than with their use against caterpillars of younger instars (L₁–L₃) as during this period, the pest forms spider nests. The most effective in destroying the first generation of the fall webworm caterpillars of the middle instars (L₄–L₅) on the 14th day after the use was also the preparation Koragen 20% suspension concentrate. The use of insecticide Nurel D, 55 % emulsion concentrate made it possible to destroy 85.6 % of the fall webworm caterpillars in 2019, and 78.8 % in 2020 on the 14th day after use. Among biological preparations in 2019-2020, Actofit, 0.2 % emulsion concentrate proved to be quite effective in destroying caterpillars of the fourth – fifth instars of the fall webworm, namely: on the 7th day after the use, 75.5 % of caterpillars died, both in 2019 and in 2020. Biological product Lepidocide, water-soluble, titre 1.5*10⁹ spores/ml was less effective in destroying caterpillars of middle instars (L₄–L₅).

When using the chemical insecticide Koragen, 20 % suspension concentrate against the second generation of caterpillars of middle instars (L₄–L₅), the effectiveness in 2019-2020 on the 14th day of the experiment was 84.5 % and 80.7 %, respectively. The use of insecticide Nurel D, 55 % emulsion concentrate in 2019 contributed to the destruction of 80.3 % of the fall webworm caterpillars of the middle instars on the 14th day after spraying, which is 6.7 % less compared to 2020.

The most effective chemical insecticide in destroying the first generation caterpillars of older instars (L₆–L₇) in 2019-2020 was Koragen 20 % suspension concentrate, which provided 92.9 % and 92.9 % death of

the fall webworm caterpillars on the 14th day after the use. Insecticide Nurel D, 55 % emulsion concentrate showed 87.6 % effectiveness in the destruction of caterpillars on the 14th day, which is 5.3 % less compared to the previous preparation in 2019. Among biological preparations: Actofit, 0.2 % emulsion concentrate, Lepidocide, water-soluble, titre $1.5 \cdot 10^9$ spores/ml and Bitoxibacillin-BTU, tetro preparative mixture, titer $100 \cdot 10^9$ spores/ml, Actofit, 0.2 % emulsion concentrate proved to be the best and contributed to the death of the fall webworm caterpillars 82.7 % in 2019 and in 2020 – 78.5 % on the 14th day of the use, in contrast to Lepidocide, water-soluble, titre $1.5 \cdot 10^9$ spores/ml and Bitoxibacillin-BTU, tetro preparative mixture, titer $100 \cdot 10^9$ spores/ml the efficiency of which in 2019 was 82.1 % and 74.8 %, and in 2020 – 77.6 % and 72.4 %, respectively.

In 2019–2020, an effective preparation in the destruction of the second generation caterpillars of older instars (L_6 – L_7), among those used was Koragen, 20 % suspension concentrate, which on the 14th day of the use showed 86.1 % and 81.6 % effectiveness. Among biological preparations in 2019 and 2020, Actofit, 0.2 % emulsion concentrate was the most effective and contributed to the death of the fall webworm caterpillars 82.0 % in 2019 and 72.3 % in 2020 which is 9.7 % less compared to 2019.

In the control variant, the death of caterpillars was observed in 2020 beginning from the 3rd day, but in 2019 from the 7th and 14th days, the death of caterpillars of the first and second generation was in the range of 0.3 % – 2.8 %, respectively, which can be caused by various negative factors and natural enemies of the fall webworm.

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**THE MONITORING OF PHYTOSANITARY STATUS OF MAIN
FIELD CROPS IN THE WESTERN REGION OF UKRAINE**

Problem statement. The combination of fertile soils and favorable climate facilitate the growth of agriculture of Ukraine [4]. Analyzing of dynamic of main crops production in Ukraine during 1990–2020, we detected increasing in sown areas under main crops, except sugar beet. Sown area significantly increased under soybean (more than 20 times) and under