

Application Of the Green Lacewing (*Chrysopa Septempunctata*) Entomophage Against Sucking Pests in Almond Biocenosis and Determination of Its Biological Efficiency

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Abstract: The green peach aphid (*Myzodes persicae*) is considered one of the primary sucking pests widely distributed within the almond biocenosis. This pest is also prevalent in apricot, peach, and almond orchards. Peach aphids extensively cover plant leaves, contaminating them and sucking the sap, which leads to changes in both color and morphology. Consequently, severely infested trees shed their fruit prematurely. In certain instances, the pest can also cause deformation of the fruit.

Introduction: Scientific research conducted previously reveals that this pest is widespread across the Fergana Valley, causing significant economic damage to peaches, apricots, cherries, almonds, and several other stone fruit trees. In our studies, we utilized the green

lacewing (*Chrysopa septempunctata*) entomophage against this pest and achieved high biological efficacy. Application of the green lacewing (*Chrysopa septempunctata*) entomophage against the green peach aphid (*Myzodes persicae*) in almond biocenosis and determination of its biological efficacy.

Variants	Number of aphids (pcs)		Biological efficacy by days (%)		
	per leaf	Average number of aphids per model tree	7	9	11
Predator-to-prey ratio 1:5	11,4±02	1124,2±0.04	64.7	72.5	81.8
Predator-to-prey ratio 1:10	16,5±08	1542,6±0.03	58.6	65.3	70.4
Predator-to-prey ratio 1:15	14,8±04	1396,3±0.06	46.5	57.4	65.2
Control	15,2±06	1487,4±0.05	-	-	-
Average			45,6	65,0	72,4

Table 1. (Conducted on 10 hectares of orchard area at "Quva Tomorka Yer Uchastkalarini Rivojlantirish Ilmiy-Amaliy Markaz Tomorka Khizmati" LLC, Quva district, Fergana region, 2022–2024).

The primary part of the research was conducted in a 10-hectare orchard belonging to the "Quva Center for Scientific and Practical Development of Household Land Plots and Household Services" LLC, located in the Quva district of the Fergana region. The study focused on areas infested with the green peach aphid (*Myzodes persicae*), which damages the "Shirin Maghiz" almond

variety.

It was determined that within the 1-hectare experimental plot, the average population of peach aphids reached 16±2 individuals per almond leaf. During the experiments, the average air temperature was recorded at +24±2°C, with a relative humidity of 60±2%. The green lacewing (*Chrysopa*

septempunctata) entomophage was applied during its egg stage using specialized cloth carriers on five designated "module trees" within the 1-hectare area. The predatory entomophages were released at ratios of 1:5, 1:10, and 1:15, calculated based on the average pest density per module tree. The biological efficacy of the entomophages was monitored and recorded every three days (Table 5.3).

In these studies, the distance between each module tree was set at 50 meters, and the selected trees were enclosed with entomological netting. It is important to note that the average age of the selected module trees was 4–5 years. This specific age group was chosen because enclosing older trees with netting presents significant technical challenges. Consequently, our research on managing sucking pests within the almond biocenosis focused primarily on these 4–5-year-old trees.

The experimental results showed varying levels of biological efficacy across the different ratios. In the first variant, where the green lacewing was applied at a 1:5 (predator:prey) ratio against the peach aphid, the biological efficacy was 64.7% after 7 days, 72.5% after 9 days, and reached 81.8% by the 11th day.

In the second variant, the efficacy was recorded at 65.3% on both the 7th and 9th days, increasing to 70.4% on the 11th day. In the third variant, using a ratio of 1:20, the biological efficacy was 46.5% on day 7, 57.4% on day 9, and 65.2% on day 11. Overall, the average biological efficacy across the study was determined to be 72.4% by the 11th day of the experiment. The entomofauna of the Fergana Valley is remarkably diverse, harboring a wide array of natural enemies (entomophages) that prey on pests within the almond biocenosis. Among the sucking pests that cause substantial economic damage to almond production, the two-spotted spider mite (*Tetranychus urticae* Koch.) is another prominent and destructive species. Application of the Green Lacewing (*Chrysopa septempunctata*) Entomophage Against the Two-Spotted Spider Mite (*Tetranychus urticae* Koch.) in Almond Biocenosis and Determination of Its Biological Efficacy. A 10-hectare almond orchard at the "Quva Center for Scientific and Practical Development of Household Land Plots and Household Services" LLC, Quva District, Fergana Region (2022–2024).

Experimental Variants (Predator:Prey Ratio)	Average number of spider mites per leaf (pcs)				Biological efficacy against spider mites by days (%)		
	Initial population (pcs/leaf)	Average number of spider mites consumed/suppressed (pcs)			7	9	11
		7	9	11			
Predator : Spider Mite 1:5	15,2±0.4	8,4±0.8	6,5±0.2	4,9±0.3	52,5±0.2	61,8±0.4	72,5±0.2
Predator : Spider Mite 1:10	16,3±0.2	10,5±0.2	8,4±0.5	6,8±0.4	43,5±0.4	50,2±0.3	68,3±0.6
Predator : Spider Mite 1:15	15,8±0.5	11,7±0.3	9,7±0.3	8,2±0.7	41,4±0.8	48,3±0.6	51,6±0.3
Average	15,7±0.3	10,2±0.4	8,2±0,3	6,6±0.4	45,8±0.4	53,4±0.4	64,1±0.3
Control (No entomophages released)	13,7	-	-	-	-	-	-
	15,3	-	-	-	-	-	-
	14,8	-	-	-	-	-	-

Table 2. Efficiency of using *Chrysopa septempunctata* against the two-spotted spider mite (*Tetranychus urticae*) in almond orchards

To expand the scope of our scientific research, we conducted studies to evaluate the application and biological efficacy of a new generation laboratory-

reared line of the green lacewing (*Chrysopa septempunctata*) against the two-spotted spider mite (*Tetranychus urticae* Koch). The research was carried out across a 2-hectare area specifically allocated for

this experiment within a larger 10-hectare almond orchard belonging to the "Quva Center for Scientific and Practical Development of Household Land Plots and Household Services" LLC, located in the Quva district of the Fergana region. It was determined that the experimental plot contained a total of 365 almond trees over the 2 hectares. Experiments were conducted in both small-scale and large-scale plots, and the average indicators were systematically calculated. Initial assessments revealed an average population of 15–16 spider mites (all stages) per individual almond leaf.

Following the application of the green lacewing (*Chrysopa septempunctata*) entomophage against the two-spotted spider mite (*Tetranychus urticae* Koch.), observations were conducted every three days, and the results were averaged. Specifically, the data was recorded and calculated on days 7, 9, and 11 of the experiment. During the study period, the average daily temperature was $+28.2\pm 2^{\circ}\text{C}$, and the average relative humidity was $61\pm 2\%$. In the first stage of our scientific research, the biological efficacy of the green lacewing was evaluated at a 1:5 (predator:prey) ratio. Initial observations on day 7 showed an efficacy of 52.5%, which increased to 61.8% on day 9, and reached 72.5% by day 11.

In the second variant, using a 1:10 ratio, the efficacy was 43.5% on day 7, 50.2% on day 9, and 68.3% by day 11. In the third variant, at a 1:15 ratio, the efficacy was recorded as 41.4% on day 7, 48.3% on day 9, and 51.6% on day 11. The overall average biological efficacy across the experiment was calculated as 45.8% on day 7, 53.4% on day 9, and 64.1% on day 11.

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