EFFICACY OF CHEMICALS AGAINST SWEET BELL PEPPER PESTS IN HYDROPONICS

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Abstract. *In the article, research was conducted to determine the effectiveness of chemical preparations against pollinator pests, which harm the export sweet bell pepper grown in modern hydroponic greenhouses. Researches were conducted in the 2.0-hectare area of the greenhouse farm belonging to Daromad Omad Fayz LLC in Okdarya district of Samarkand region. Based on the conducted research, practical conclusions and recommendations are given.*

Keywords: *hydroponics, export, sweet bell pepper, aphids, thrips, aphids, new preparations, option, efficiency*

Introduction. Greenhouses based on hydroponics technology account for 80% in Scandinavian countries and more than 50% in the Netherlands. Most of the crops grown in greenhouses around the world are vegetable crops. More than 620,000 hectares of greenhouses have been built around the world, of which 430,000 hectares are used to grow tomatoes, cucumbers, sweet bell peppers, eggplants and salad plants. Today, modern hydroponic greenhouses are rapidly growing in size around the world due to several conveniences. At the same time, many insects hibernate, spread, transport and spread a number of infectious diseases.

In order to continuously provide the population with these products throughout the year, it is important to find ways and means of effective protection of their crops from diseases and pests. Various diseases and pests occur in large quantities in these types of crops and cause great damage. In the world today, greenhouse mite (Trialeurodes vaporariorum West.), greenhouse thrips (Heliothrips hatmorrhoidalis Bouche.), plant aphids (Aphididae), spider mite (Tetranychus urticae Koch.), tomato rust mite (Aculops Lycopersici Massee.), tobacco thrips (Thrips tabaci Lind.) and rodent pests; autumn moth (Agrotis segetum Den. Et Schiff.), cotton moth (Helicoverpa armigera Hbn.), caradrina (Spodoptera exigua Hb.), pore-forming flies (Agromyzidae), and other systematic families 40-50% of the plant yield is lost, and in some greenhouses even up to 60-70% as a result of severe damage by pests.

Taking into account the above, we aim to determine the effectiveness of chemical agents against sucking pests of sweet bell pepper in hydroponic conditions and give practical conclusions and suggestions for production based on the obtained results.

Place of research and research method: Experiments 2.0 researches were conducted in the greenhouse farm belonging to "Daromad Omad Fayz" LLC in Okdarya district of Samarkand region. In order to determine the effectiveness of new chemical agents against sucking pests of sweet bell pepper, Samo Farm Servis LLC received the preparation Vapcomore 20% n.kuk presented by the farm of Uzbekistan for testing. Research is conducted on the basis of generally accepted entomological observations (Fasulati, 1961; Uspensky, 1973; Khojayev, 1994, 2018; etc.). The methods of E.V. Kozhanchikov (1961), V.I. Tansky (1975, 1988) and Sh.T. Khojayev (2018) are used to study the development of insects. Toxicological studies by K.A. Gar (1963,

1967), Sh.T. Khojayev (2004) and W. Abbot (1925), biological, economic and economic efficiency by A.F. Chenkin (1979) and Sh.T. Khojayev (2004)) based on recommendations.

Research results. During the growing season of vegetables and potatoes in the greenhouse farms of our republic, there are a number of sucking pests, and 30-40% of the crop dies due to the damage caused by these pests.

Several types of these pests cause damage to aphids in the greenhouse. Among them, alfalfa or acacia sap, cotton or polys sap are harmful. At the same time, tobacco thrips and aphids settle on the young leaves and growth points of sweet bell pepper and bite and damage them. The underside of the affected leaves has a distinctive silvery sheen, and the damaged buds have wrinkled, uneven leaves. When the growing point dies, the development of the plant is disrupted, sometimes the young plant dies.

In 2023, Vapcomore 20% n.kuk preparation 0.15-0.2 l/ha was used against aphids, thrips, spider mites on sweet bell pepper plants grown in hydroponic conditions in greenhouses to determine the effectiveness of new chemical agents against these pests. 'rf-standard tested. As an example, Mospilan 20% n.c. the drug was selected.

According to the results of the experimental test, the Vapcomore 20% n.kuk preparation against aphids at a rate of 0.15-0.2 l/ha was used at a rate of 78.9%-80.0% compared to the control in 3 days of calculation. if the efficiency was achieved, it was the highest by the 7th day, that is, it was 88.2%-86.8%. By the 14th day of our observations, this indicator was 82.1%-84.3%, and by the 21st day, it was observed that it decreased slightly, that is, it was 77.50%-79.0% .

As a sample option, Mospilan 20% n.k. 78.4% efficiency compared to the control was achieved on the 3rd day of calculation in the case where the drug was used at a consumption rate of 0.2 l/ha, and by the 7th day of the calculation, this indicator showed 85.4%. By the 14-21 days of our observation, the efficiency is 80.3%-75.1% (Table 1).

In the control variant, it was observed that the number of aphids did not decrease during 21 days.

According to the results of the conducted research, Vapcomore 20% n.kuk preparation against thrips in the variant used at a consumption rate of 0.15-0.2 l/ha was 81.5%-83% compared to the control in 3 counting days. When 1% efficiency was achieved, it was the highest by day 7, which was 88.3%-86.8%. By the 14th day of our observations, this indicator was 80.2%-81.7%, and by the 21st day, it was slightly decreased, that is, it was 76.3%-78.1%.

As a sample option, Mospilan 20% n.k. 80.2% efficiency compared to the control was achieved in the case of the drug being used at a consumption rate of 0.2 l/ha on the 3rd day, and 86.4% on the 7th day. By the 14-21 days of our observations, the efficiency is 79.4%-75.0% (Table 2).

In the control variant, it was observed that the number of thrips did not decrease during 21 days.

According to the results of the conducted research, the anti-mite Vapcomore 20% n.kuk preparation at the rate of 0.15-0.2 l/ha was used in the standard consumption mode on the 3rd day compared to the control by 89.2%-90, When 1% efficiency was achieved, it was the highest by day 7, which was 87.5%-88.2%. By the 14th day of our observation, this indicator was 84.9%-85.6%, and by the 21st day, it was slightly decreased, that is, it was 82.3%-83.1%.

As a sample option, Mospilan 20% n.k. 88.2% efficiency compared to the control was achieved in the case of the drug being used at a consumption rate of 0.15 l/ha on the 3rd day, and

86.5% on the 7th day. By the 14-21 days of our observations, the efficiency is 84.4%-82.0% (-table).

In the control variant, it was observed that the number of cockroaches did not decrease during 21 days.

Table 1.

Biological efficiency of the preparation Vapcomore 20% n.kuk against aphids in the greenhouse (Greenhouse farm belonging to "Daromad Omad Fayz" LLC in Okdarya district, Samarkand region, 10.09.2023)

№	Versions	Consumption amount 1/ha, kg/ha	The number of aphids on one leaf, pcs				
			Before processing	After processing, the following days			
				3 day	7 day	14 day	21 day
1.	Vapcomore 20% n.kuk	0,2	25,1	4,8	3,1	4,3	6,1
2.	Vapcomore 20% n.kuk	0,15	24,6	5,2	3,4	4,8	6,4
3.	Mospilan 20% n.c. (template)	0,15	25,5	5,5	3,7	5,0	6,5
4.	Control (unprocessed)	-	26,2	26,3	27,5	28,6	30,3
Biological efficiency (%)							
1.	Vapcomore 20% n.kuk	0,2	26,3	80,9	88,2	84,3	79,0
2.	Vapcomore 20% n.kuk	0,15	25,7	78,9	86,8	82,1	77,5
3.	Mospilan 20% n.c. (template)	0,15	25,5	78,4	85,4	80,3	75,1
4.	Control (unprocessed)	-	26,2	-	-	-	-

Table 2.

Biological efficiency of Vapcomore 20% n.kuk preparation against thrips in the greenhouse (Greenhouse farm belonging to "Daromad Omad Fayz" LLC in Okdarya district, Samarkand region, 10.09.2023)

№	Versions	Consumption amount 1/ha, kg/ha	The number of aphids on one leaf, pcs				
			Before processing	After processing, the following days			
				3 day	7 day	14 day	21 day
1.	Vapcomore 20% n.kuk	0,15	15,7	3,0	2,8	3,2	3,5
2.	Vapcomore 20% n.kuk	0,2	15,8	2,8	2,5	3,2	3,5

3.	Mospilan 20% n.c. (template)	0,15	16,6	3,0	2,8	2,9	3,6
4.	Control (unprocessed)	-	16,5	17,2	18,1	19,4	20,1
Biological efficiency (%)							
1.	Vapcomore 20% n.kuk	0,15	15,7	81,5	85,6	80,2	76,3
2.	Vapcomore 20% n.kuk	0,2	15,8	83,1	88,3	81,7	78,1
3.	Mospilan 20% n.c. (template)	0,15	16,6	80,2	86,6	79,4	75,0
4.	Mospilan 20% n.c. (template)	-	16,7	-	-	-	-

Table 3.

Biological efficiency of Vapcomore 20% n.kuk drug against spider mite in greenhouse (Faradis threshing farm, located in Yukorichirchik district, Tashkent region, 10.09.2023)

№	Variants (name of drugs)	Consumption rate, l/ha	The average number of mites on one leaf, pcs					Biological efficiency by days,%			
			Before processing	days after processing							
				3	7	14	21	3	7	14	21
1.	Control *(ishlov berilmagan)*	-	16,5	17,2	18,1	19,4	20,1	-	-	-	
2.	Mospilan 20% n.c. (template)	0,15	16,4	2,3	2,6	2,8	3,0	88,5	86,5	84,4	82,3
3.	Vapcomore 20% n.kuk	0,2	15,9	1,9	2,2	2,5	2,8	90,1	88,2	85,6	83,1
4.	Vapcomore 20% n.kuk	0,15	15,7	2.1	2,3	2,6	2,9	89,2	87,5	84,9	82,3

6. Conclusions

1. Vapcomore 20% n.kuk drug used at the rate of 0.15-0.2 l/ha against aphids, thrips, spider mite in hydroponic conditions showed high effectiveness. Biological efficiency was 86.8%-88.2% against aphids, 85.6%-88.3% against thrips, 89.2%-90.1% against spider mites.

2. In hydroponic conditions, it is recommended to carry out coordinated control measures against aphids, thrips, spider mite in a timely manner, and if the economic damage of pests exceeds the dangerous limit, it is recommended to use chemical means.

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