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Study of the Action and Translocation of Zaragen Insecticide in Food Production

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Abstract

Today we need to pay more attention to the composition and quality of agricultural products grown among the population, especially in order to prevent foodborne diseases that occur in children.

Keywords: Pesticides, chemical compounds, insecticides, Synthetic pyrethroids, toxicity, tomato, soil layer, transslocation.

Introduction

As a result of the growing chemicalization of the national economy, the production and use of chemical compounds used in industrial enterprises and agriculture is constantly growing. But it is impossible to imagine agricultural production without pesticides. Also, the effects of chemical compounds, semi-intermediate products, wastes on the human body, which are formed during the production process, are not harmless in all cases. The study and evaluation of the toxicity of new chemicals requires the evaluation of technological processes, the development of hygienic standards, the prevention of occupational poisoning and other measures.

Given the long-term complications of some pesticides, it is important to conduct comprehensive toxicological and hygienic testing and develop their safe regulations before allowing them to be used in agriculture.

Given the high effectiveness of pesticides belonging to the group of synthetic pyrethroids against agricultural pests, it requires the development of new insecticides belonging to this class. As a result of such research, a new, promising insecticide Zaragen was created in our republic.

The purpose of the study. To study the level of danger of Zaragen insecticide to humans and to develop hygienic norms and regulations to ensure its safety in hot climates (consumers of atmospheric air, workplace air, water bodies, soil, food products) and agricultural products

Materials and methods: A wide range of pesticides are used to protect agricultural plants. All of this is aimed at destroying living organisms together and separately. Therefore, taking into account the multifaceted factors, taking into account their degree of preservation in nature, the hygienic substantiation of permissible norms and regulations of pesticide residues is the basis for preventing their negative impact on the human body

Analysis of the results of the study of the dynamics of movement and translocation of Zaragen insecticide in the conditions of yellow soil planted tomatoes.

Zaragen insecticide was used in the amount of 0.01, 0.10, 0.15, 0.20 kg / ha in yellow soil conditions planted tomatoes. Soil layers (0-10, 10-20, 20-30 cm) and insecticide residue on tomato

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leaves were checked at 10, 20, 30, 60, 90, 120 days.

When Zaragen insecticide was applied in an amount of 0.01 kg / ha in yellow soil planted with tomatoes, the insecticide residue was detected in an amount of 0.01 ± 0.001 mg / kg in a 0–10 cm layer of soil only after 10 days.

From day 20, the drug was not detected in a single layer of soil. Also, no translocation of the insecticide on the tomato leaf was observed. When the insecticide was used in an amount of 0.10kg / ha, its migration in the examined layers of soil was observed. Zaragen was recorded in 0–10 cm of soil at a rate of 0.06 ± 0.005–0.02 ± 0.001 mg / kg for 10 to 90 days, and at 10–20 cm at a rate of 0.05 ± 0.005–0.01 ± 0.001 mg / kg.

When the insecticide was used in an amount of 0.10 kg / ha, its translocation in tomato leaf was observed for 10 to 20 days (0.01 ± 0.001 mg / kg). On the 30th day of the experiment, a trace of it was found on a tomato leaf.

When the dose of insecticide was increased to 0.15 kg / ha, it was observed that the soil layer of the drug appeared at a rate of 0.07 ± 0.005 mg / kg in 10 days at 0-10 cm.

Table 1

Dynamic action of Zaragen insecticide in yellow soil conditions planted with tomatoes

t / r	Used amount, kg / ha	Sampled, day drug	was determined, mg / kg at a depth of cm mg / kg			leaf mg / kg
			0-10	10-20	20-30	
1.	0, 01	10	0,01±0,001	-	-	-
		20	-	-	-	-
		30	-	-	-	-
		60	-	-	-	-
		90	-	-	-	-
		120	-	-	-	-
2.	0,10	10	0,06±0,005	0,05±0,004	-	0,01±0,000
		20	0,05±0,004	0,04±0,003	-	0,01±0,001
		30	0,04±0,003	0,03±0,003	-	0,01±0,001
		60	0,03±0,003	0,02±0,002	-	изи
		90	0,02±0,001	0,01±0,001	-	-
		120	-	-	-	-
3.	0,15	10	0,07±0,005	0,06±0,004	-	0,03±0,002
		20	0,06±0,005	0,05±0,003	-	0,02±0,001
		30	0,05±0,003	0,04±0,003	-	0,02±0,001
		60	0,04±0,002	0,03±0,002	-	0,01±0,001
		90	0,03±0,002	0,02±0,002	-	изи

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		120	-	-	-	-
4.	0,20	10 20 30 60 90 120	0,08±0,007 0,07±0,006 0,06±0,003 0,05±0,002 0,04±0,003 -	0,06±0,005 0,05±0,005 0,05±0,004 0,04±0,003 0,03±0,002 -	0,04±0,003 0,03±0,003 0,02±0,002 0,03±0,001 0,01±0,002 -	0,04±0,003 0,04±0,003 0,03±0,002 0,03±0,002 0,02±0,001 -

Accumulation of the insecticide in the soil to a depth of 0–10 cm continued for 90 days (0.03 ± 0.002 mg / kg). Migration of Zaragen soil layer was observed at 10-20 cm. In this layer of soil, its residue on day 10 was 0.06 ± 0.005 mg / kg, after 20 days 0.05 ± 0.003 mg / kg, after 30 days 0.04 ± 0.003 mg / kg, after 90 days 0.02 Was detected at a dose of ± 0.002 mg / kg. From day 120 of the experiment, the insecticide was not detected in any layer of soil. When the insecticide was applied in an amount of 0.15 kg / ha, its migration was not observed at a depth of 20-30 cm in the soil

When the insecticide was used in an amount of 0.15kg / ha, from the 10th day of the experiment, its transition to tomato leaf was recorded.

On day 10 of the examination, 0.03 ± 0.003 mg / kg was detected in the tomato leaf, 0.03 ± 0.003 mg / kg on day 20, 0.02 mg / kg on day 30, and a trace was detected on day 90.

Zaragen insecticide was observed to accumulate in the tested soil layers (0-10, 10-20, 20-30 cm) from day 10 when applied in the amount of 0.20 kg / ha in areas planted with tomatoes. This collection lasted for 90 days and at 120 days the insecticide was not found in the soil layers. It should be noted that translocation of Zaragen insecticide to tomato leaf began on day 10 (0.04 ± 0.003mg / kg). Check

On day 90, the insecticide was detected in tomato leaf at a dose of 0.02 ± 0.001 mg / kg. On day 120, no insecticide residue was detected on the tomato leaf.

Zaragen insecticide was applied in the amount of 0.01, 0.10, 0.15, 0.20 kg / ha in the gravel soil planted with tomatoes. Insecticide residue in soil and tomato leaf was checked on days 10, 20, 30, 60, 90, 120

(See Table 3.10).

When Zaragen insecticide was used in yellow gravel soil conditions at 0.01kg / ha, after 10 days, its residue in the 0–10 cm layer of insecticide was determined at 0.01 ± 0.001 mg / kg. Insecticide residue was not detected in other layers of soil (10-20, 20-30 cm) and on tomato leaves.

When the drug was used in an amount of 0.10kg / ha, the residue of the insecticide was determined in the amount of 0.05 ± 0.004 - 0.01 ± 0.001 mg / kg for 10 to 90 days in all tested layers of gravel soil conditions.

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Table 2

The dynamic action of Zaragen insecticide on yellow gravel soil conditions planted with tomatoes

The amount used is kg / ha	Sample date	The drug was detected, mg / kg, at depth, cm			Bargida mg / kg
		0 - 10	10 - 20	20 - 30	
0,01	10	0,01 ± 0,001	-	-	-
	20	-	-	-	-
	30	-	-	-	-
	60	-	-	-	-
	90	-	-	-	-
	120	-	-	-	-
0,10	10	0,05 ± 0,004	0,06 ± 0,005	0,05 ± 0,004	0,02 ± 0,001
	20	0,04 ± 0,003	0,05 ± 0,004	0,04 ± 0,003	0,01 ± 0,001
	30	0,03 ± 0,002	0,04 ± 0,003	0,03 ± 0,002	Изи
	60	0,02 ± 0,001	0,03 ± 0,002	0,02 ± 0,002	-
	90	0,01 ± 0,001	0,02 ± 0,001	0,01 ± 0,001	-
	120	-	-	-	-
0,15	10	0,06 ± 0,005	0,07 ± 0,006	0,05 ± 0,005	0,04 ± 0,002
	20	0,05 ± 0,005	0,06 ± 0,005	0,04 ± 0,003	0,03 ± 0,002
	30	0,04 ± 0,003	0,05 ± 0,004	0,04 ± 0,002	0,03 ± 0,002
	60	0,03 ± 0,002	0,04 ± 0,003	0,03 ± 0,002	0,02 ± 0,001
	90	0,02 ± 0,002	0,03 ± 0,002	0,02 ± 0,001	0,01 ± 0,001
	120	-	-	-	-
0,20	10	0,07 ± 0,005	0,08 ± 0,007	0,06 ± 0,005	0,05 ± 0,003
	20	0,06 ± 0,005	0,07 ± 0,006	0,06 ± 0,005	0,05 ± 0,003
	30	0,05 ± 0,004	0,06 ± 0,005	0,05 ± 0,004	0,04 ± 0,002
	60	0,04 ± 0,003	0,05 ± 0,004	0,04 ± 0,003	0,03 ± 0,001
	90	0,03 ± 0,003	0,04 ± 0,003	0,03 ± 0,002	0,02 ± 0,001
	120	-	-	-	-

It should be noted that more (14-51%) migration of the insecticide was observed (0.06 ± 0.005-0.02 ± 0.001 mg / kg) than in the 10-20 cm surface area (0-10 cm) of the soil layers. At -30 cm, the drug was detected in an amount of 0.05 ± 0.004-0.01 ± 0.001 mg / kg for 10 to 90 days. When the insecticide was used in an amount of 0.10 kg / ha, its tomato leaf was observed in the body for 10–20 days (0.01 ± 0.001 mg / kg).

On the 30th day, a trace of insecticide was detected on a tomato leaf.

When the application rate is increased to 0.15 kg / ha, the migration of the insecticide across the soil layer is further enhanced.

The drug was detected at a depth of 0–10 cm in soil for 10 days (0.06 ± 0.005 mg / kg) to 90

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days (0.02 ± 0.002 mg / kg).

When this amount of insecticide was used, 12 to 27 percent more migration of soil was observed at a depth of 10–20 cm than at a depth of 0–10 cm. Insecticide in 20–30 cm layer of soil

Accumulated in an amount of 0.05 ± 0.005-0.02 ± 0.001 mg / kg from 10 days to 90 days.

The insecticide used in this amount was found in tomato body for 10 to 90 days (0.04 ± 0.003 - 0.01 ± 0.001 mg / kg).

When the dose of the drug was increased by 0.20 kg / ha, a large amount of insecticide was observed in all layers of soil (0-10,10-20, 20-30 cm). Large amounts of insecticide were detected in 10-20, 20-30 cm of soil.

Insecticide 0-10 cm of soil for 10 to 90 days

0.07 ± 0.005-0.03 ± 0.003 mg / kg, 0.08 ± 0.007-0.04 ± 0.003 mg / kg in 10-20 cm,

0.06 ± 0.005-0.03 ± 0.002 mg / kg was recorded at 20-30 cm.

When Zaragen insecticide is used in the amount of 0.20 kg / ha in tomato planted gravel soil, the drug begins to accumulate in the tomato body from 10 days (0.05 ± 0.004 mg / kg).

On day 90 of the study, the insecticide was also found in tomato leaf at a dose of 0.02 ± 0.002 mg / kg.

Conclusion. Zaragen insecticide contaminates food derived from tomatoes when used in agriculture. The degree of contamination of agricultural products depends on the amount of insecticide used, the type of soil and food. Zaragen insecticide contaminates plant-derived food products more than gravelly soils under yellow-grained soil conditions. Because in yellow-grained soil conditions, the insecticide accumulates in the layer where the plant root is located (0-10 cm). This should be taken into account when assessing the level of environmental hazards of new pesticides.

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