Volume 2, Issue 8, August - 2024
ISSN (E): 2938-3781

Web of Agriculture: Journal of Agriculture and Biological Sciences
webofjournals.com/index.php/8

INSECTICIDE TWINGO EURO, MD S.K. IN THE FIGHT AGAINST LEAF ROLLERS AND SCALE INSECTS ON THE APPLE TREE

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Abstract
The insecticide Twingo Euro, MD s.k. showed high efficacy against leaf rollers and scale insects on apple trees at a rate of 0.5-0.8 l/ha. We recommend the insecticide Twingo Euro, MD s.k. for use against leaf rollers and scale insects on apple at a rate of 0.5-0.8 l/ha. by treatment during the growing season of the plant.

Keywords: Insecticide, effectiveness, scale insects, leaf rollers, apple tree, consumption rate, treatment, plants.

Introduction

Agriculture is the main branch in the economy of the Republic of Uzbekistan. In order to ensure food safety in the Republic, research is being carried out on advanced technologies for growing agricultural products and protecting it from pests. But part of the products grown in orchards dies under the influence of pests. number and, on this basis, the improvement of the integrated system of pest control of apple trees are of great scientific and practical importance. Modern technologies for the production of agricultural products, based on the widespread use of pesticides and mineral fertilizers, have made it possible to largely solve the problem of providing the population with food, and, at the same time, have given rise to numerous ecological, medical and environmental problems, problems of environmentally friendly and biologically complete food, rehabilitation of land, restoration of their fertility. Therefore, it is very modern to replace them with new classes of pesticides with different mechanisms of action, high selectivity and low toxicity for warm-blooded animals.

At present, ensuring the country's food security, the production of environmentally friendly products, a significant increase in the export potential in the agro-industrial complex, an increase in new intensive orchards, the creation and introduction into production of new breeding varieties resistant to harmful organisms and suitable for local soil and climatic conditions. Improving the integrated system of protection of orchards from pests is one of the urgent tasks of our time.

Significant funds have been allocated to achieve these goals , fruit-growing farmers have been supported and the result has borne fruit. Horticultural products from Uzbekistan are in demand on the world market. Currently , the export of food, fruits and vegetables has totaled about 5 billion dollars. Over the past three years, the volume of exported agricultural products has more than tripled. Our country sends more than 180 types of selected products to 80 countries of the world fruits and vegetables and products made from them. Uzbekistan is one of the top ten countries in the world -

Volume 2, Issue 8, August - 2024
ISSN (E): 2938-3781

leaders in the export of apricots, plums, grapes, nuts, cabbage and many other types of fruits and vegetables [3].

In order to maintain the potential for environmental sustainability of plants, including their resistance to pathogens, the use of pesticides should be minimized. Organophosphate insecticides are especially dangerous for plants, as they can block the work of important redox enzymes responsible for environmental stability, including pathogens [11].

The requirements for the registration of pesticides are increasing, for example, more than 1,200 active substances of pesticides are registered in the United States and 20,000 drugs worth $12 billion are in circulation annually. Since 1988, under the auspices of the Environmental Protection Agency, pesticides have been systematically re-registered in accordance with the new requirements, thus improving the quality of the pesticide range [3]. In the EU countries, it was decided to support 463 out of the list of 967 pesticides. 429 drugs are not subject to re-registration, 48 drugs are included in the list and 27 drugs are excluded [11].

M.T. Petrukhina [6] conducted an experiment with the use of entobacterin mixed with bard liquid, on the 12th day of the experiment the efficacy was 98.8%. O.Z. Metlitsky [6] proved the high efficiency of the use of biological preparations against the American white butterfly. In 1986-1987, the staff of the Institute of Zoology of the Academy of Sciences of Ukraine used lepidocide against garden pests at a rate of 1.5 kg/ha, the effectiveness was 84.0-90.0% [10].

So far, a complete rejection of the chemical method in orchards and vineyards is not possible, but as a result of the reorientation of farms to bioprotection, the consumption of pesticides is reduced by three times [5]. The expediency of using biological means of protection is also confirmed by the increase in the profitability of production, in Primorye, for example, the profitability from the chemical method was 19.5%, from the joint use of biological and chemical - 26%, and from the biological method the profitability was already 36.7% [2].

On fruit crops and vines, mites are one of the most dangerous pests. Biological control measures on these crops have not yet been developed as perfectly as against pests belonging to the insect class. There are studies where the influence of leaf pubescence on the number of spider mites on grapes has been noted, where varieties with low and medium drooping are especially affected by the mite, and varieties with felt drooping are slightly damaged [1].

The insecticide Twingo Euro, MD s.k. was tested in a vigorous apple orchard of the farm "Kuzibayev Zhamolbek", Shavat district, Kharezm region. The zone is located in the Turan lowland agricultural zone. The orchards were laid 12 years ago, apple trees of the Golden Delicious variety. Treatments were carried out using a knapsack motor sprayer K-90, with an estimated rate of consumption of working fluid of 1000 l/ha. Experiments were carried out in the morning hours, from 7 to 8 o'clock, when the air temperature did not exceed 28 °C and the wind speed was 1 m/s.

The laying of experiments, subsequent counts and calculations of biological efficiency were carried out in accordance with the "Methodological Instructions..." (2004), approved by the State Chemical Commission of the Republic of Uzbekistan [5].

We tested apple trees against a number of pests. Lepidopteran pests were moths on the apple tree, here, after two treatments with Twingo Euro, MD s.k. at the rate of 0.5 l/ha, the decrease in the number of caterpillars was 87.2%, and the decrease in fruit damage was 80.6% (Table 1). With an increase in the rate of consumption of this drug to 0.8 l/ha, the decrease in the number of caterpillars of leaf rollers was 92.3%, and the reduction of fruit damage was 87.8%. These indicators are also at the same level as the reference

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variant, where Nurell-D was used, 55% EC, at a rate of 1.0 l/ha, where the decrease in the number of caterpillars was 89.7%, and the decrease in fruit damage was 83.7% (Table 1). The results show that Twingo Euro, MD s.k. shows high efficiency when treated against leaf rollers on apple trees at a consumption rate of 0.5-0.8 l/ha.

Table 1 **Biological efficacy of Twingo Euro, MD against leaf rollers on apple trees**
production experience, 08/20/2023, Kharezm region, Shavat district, farm Kuzibayev Zhamolbek

№	Variant	Consumption rate of preparations, l/ha	Number of tracks		Damage, %				Decrease relative to control, %	
			per 100 kidneys	per 100 leaves	Kidney	Leaves	Fruit		Caterpillar numbers	damage to fruits
							carrion	Removable crop		
1	Twingo Euro, MD s.k.	0,5	2,4	2,6	2,4	3,0	2,6	1,2	87,2	80,6
2	Twingo Euro, MD s.k.	0,8	1,2	1,8	1,6	1,2	1,6	0,8	92,3	87,8
3	Nuker-Pro, 55% EC (benchmark)	1,0	1,6	2,4	2,2	2,8	2,2	1,0	89,7	83,7
4	Inspection (without processing)	-	15,6	23,4	17,8	21,6	12,0	7,6	-	-

Further, the insecticide Twingo Euro, MD s.k. were carried out against scale insects of the larval stage. After treatment at the rate of 0.5 l/ha, on the 1st day the efficiency was 66.5% (Table 3), and on the 3rd day it increased to 77.5%, the maximum efficiency index was shown on the 7th day and amounted to 88.1%, later a slight decrease in efficiency was observed and on the 14th day it was 97.9%, and on the 21st day – 85.3%. With a consumption rate of 0.8 l/ha, the dynamics of the indicator was similar, but with increased efficiency, so on the 1st day it was 86.5% (Table 2), on the 3rd day – 91.3%, on the 7th day – 92.0%, on the 14th day – 92.6% and on the 21st day – 92.6%. These results are approximately at the same level as the indicators of the reference variant, where Bagheera was used, 20% EC, at a rate of 0.2 l/ha, here on the 1st day the efficacy was 75.1% (Table 3), on the 3rd day – 87.9%, on the 7th day – 93.0%, on the 14th day – 93.5%, and on the 21st day – 93.5%. Based on the results, it can be concluded that Twingo Euro, MD s.k. is effective against scale larvae on apple trees at a consumption rate of 0.5-0.8 l/ha.

Table 2 **Biological efficacy of Twingo Euro, MD against scale larvae on apple trees**
production experience, 04/18/2023, Kharezm region, Shavat district, farm Kuzibayev Zhamolbek

№	Variant	Consumption rate of preparations, l, kg/ha	Number of scale insects per 10 cm of branch, ind.					Daily Biological Efficiency: %%				
			Before Processing	After treatment for the day:								
				1	3	7	14	21	1	3	7	14	21
1	Twingo Euro, MD s.k.	0,5	15,6	5,6	4,2	2,8	3,4	4,5	66,5	77,5	88,1	87,9	85,3
2	Twingo Euro, MD s.k.	0,8	17,3	2,5	1,8	2,1	2,3	2,5	86,5	91,3	92,0	92,6	92,6
3	Bagheera, 20% EC (standard)	0,2	18,0	4,8	2,6	1,9	2,1	2,3	75,1	87,9	93,0	93,5	93,5
4	Inspection (without processing)	-	14,2	15,2	17,0	21,5	25,5	27,8	-	-	-	-	-

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Conclusions and conclusion

The insecticide Twingo Euro, MD s.k. showed high efficiency against leaf rollers and scale insects on apple trees at a rate of 0.5-0.8 l/ha. We recommend the insecticide Twingo Euro, MD s.k. for use against leaf rollers and scale insects on apple trees at a rate of 0.5-0.8 l/ha. by treatment during the growing season of the plant.

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