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Research Article

BIOLOGICAL EFFECTIVENESS OF FUNGICIDES AGAINST OIDIUM DISEASE OF GRAPE

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Jumaniyazov Farkhod Kodamovich
Doctor Of Philosophy In Agriculture (Phd), Khorezm Scientific-Experimental Station, Uzbekistan

ABSTRACT

In this article, measures to fight against oidium of grapes, monitoring the development of diseases in grapes and oidium KOBRA IKS 60% w.d.g. Research work on determining the biological effectiveness of fungicide is highlighted.

KEYWORDS

Vine, fungus, disease, fungicide, oidium, biological efficiency.

INTRODUCTION

Grapes are the plant most affected by diseases and pests. This plant is characterized by the fact that the vineyards have grown in one place for a long time, as well as the fact that they are located in large arrays with different varieties and age of plants, mainly due to the peculiarities of cultivation. The greatest damage in vineyards is caused by very common fungal diseases [1,2].

Oidium disease is the most dangerous fungal disease of grapes, and in recent years, it has become equal to mildew disease in terms of harmfulness in the world. This disease was first identified in Europe in 1845, Uncinula necator Burr. The type of fungi that belongs to the species causes the disease. The disease damages all the green parts of the vine during the entire vegetation period, especially the generative organs.

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Fungal infections initially kill more than 50% of the inflorescences and later the crop [1].

The rate of development and spread of oidium mycelia to the organs affected by this disease depends on the resistance of the variety, the physiological condition of the leaves and vines, temperature and air humidity. High relative humidity (more than 58.4%) is required for the development of the disease and normal germination of mycelium. Also, the maximum infection with oidium on grape leaves occurs at an air temperature of 26-28 °C. Studies have shown that the spread of the pathogen does not occur at temperatures below 8.8 °C and above 34.0 °C and at air humidity below 47.7% [1].

Topaz 100 e.c. was used against oidium disease of grapes in the Astrakhanovo region of Russia. the highest efficiency against the disease was achieved when fungicide was used, and no toxic effect on the plant was detected as a result of these control measures [3].

Also, the use of microbiological preparations against oidium disease has been found in studies to reduce the disease somewhat. In vineyards where Fitosporin-M microbiological preparation was used alone, efficiency was achieved, albeit at a low level. It has been proven in studies that the efficiency is 1.3% when using the microbiological drug in the working solution at the rate of 10 drops/200 ml of water [4].

Research methodology. The research was conducted in 2021 in the vineyards of Horticulture, Viticulture and Winery Scientific Research Institute named after academician M.Mirzayev, Khorezm Region, Urganch District, Khorezm Scientific Experimental Station.

The tested fungicide was applied in 3 returns. Chemical treatment 3 times during the growing season; until the flowering period, after flowering, 14 days after the 2nd chemical treatment, it was carried out at the expense of 1000 l/ha working solution.

In our research, the following scale was used to determine the damage of leaves, branches and vines of grapes by oidium disease:

Scale (score)	The appearance of spots on leaves and branches	Scale (score)	Damage to vines and grape seeds
0	No stains	**0**	No damage
0.1	Rare spots	**1**	10% is damaged
1	Spots in 10%	**2**	25% is damaged
2	From 10% to 25%	**3**	50% is damaged
3	In the 25% - 50% part	**4**	50% highly damaged
4	50% high spots		

The biological effectiveness of the fungicide used against the disease was determined by the following formula:

$$B_{efc.} = \frac{a - b}{a} \times 100\%$$

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Befc. – biological efficiency;

a – disease progression rate under control;

b – disease progression rate under control.

Research results and analysis. The method of combating oidium disease in vineyards is fast and highly effective. KOBRA IKS 60% w.d.g. fungicide was tested at consumption rates of 2.0 kg/ha. As a template, Funmetiram 70% w.d.g. (2.0 kg/ha) fungicide was selected (table).

Experimental test results against oidium disease of grapes at a consumption rate of 2.0 kg/ha, COBRA IKS 60% w.d.g. 10.3% damage was observed on leaves, 7.0% on branches and 6.7% on vines when fungicide was applied. Disease development was up to 4.2% in leaves, 2.2% in branches and 2.8% in vines. Biological efficiency was up to 91.1%.

Funmetiram 70% w.d.g. (2.0 kg/ha) fungicide damage was 12.0% on leaves, 6.7% on branches, and 8.3% on vines. Biological efficiency reached 90.0%.

Table.

Used against oidium disease of grapes KOBRA IKS 60% w.d.g. biological efficiency of fungicide Field test-experience, Khorezm region, named after academician M.Mirzayev Research Institute of Horticulture, Viticulture and Winemaking, Khorezm scientific-experimental station, 2021, Uzbekistan.

Options		Application rate, kg/ha	Damaged plant parts	damage, %	disease progression, %	biological efficiency, %
Control	No chemical treatment	-	*leaves*	61,0	35,7	-
			branches	47,3	24,7	-
			grapes	56,7	28,8	-
Template	Funmetiram 70% *w.d.g.*	2,0	*leaves*	12,0	4,5	88,4
			branches	6,7	2,3	90,0
			grapes	8,3	3,1	89,4
Research	KOBRA IKS 60% *w.d.g.*	2,0	*leaves*	10,3	4,2	88,2
			branches	7,0	2,2	91,1
			grapes	6,7	2,8	90,3

CONCLUSION

In conclusion, KOBRA IKS 60% w.d.g. (2.0 kg/ha) fungicide maintained high biological efficiency. Damage was observed on leaves from 4.2% to 2.2% on branches and 2.8% on vines. Biological efficiency ranged from 88.2% to 90.3%. Also 4 times: in the vineyards during budding, during flowering, during flowering, 3rd time after 14 days of chemical treatment, 1000 l/ha working solution per hectare to help fight diseases that help to support the ground or evening cooling.

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