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TESTING OF THE RIHTER WDG PREPARATION IN THE CONTROL OF APPLE SCAB (*VENTURIA INAEQUALIS* WINT)

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Abstract. *The results of the testing of the chemical fungicide Rihter WDG in the control of apple scab variety "Renet Simirenko" in the conditions of the Republic of Moldova. The research was carried out on the experimental apple orchard of the IGFPP of MSU. Three preparation consumption norms were tested: 1,8 kg/ha, 2,2 kg/ha and 2,5 kg/ha. Used once by the spraying method. As a result, the biological efficiency against apple SCAB was 94,3%,94,0%,91,3%*

Keywords: Apple scab, biological efficacy, rihter, Venturia inaequalis wint.

INTRODUCTION

The favourable climatic conditions of the Republic of Moldova contribute to the intensive development of agriculture. In horticulture among perennial crops the leading place is occupied by apple trees.

About 350-400 thousand tonnes of apples are exported annually from the Republic of Moldova. The total area of apple orchards is more than 70 thousand ha out of 3 384 ha covering the entire territory of the Republic of Moldova. Thanks to the rich diversity of the soil and the possibilities for storage, apples can be eaten fresh all year round. The flavour of our apples is easily recognised on the foreign market. All foreign citizens who have tasted Moldovan fruit have been impressed by its quality and flavour - the "apple taste", as Moldovan apples are still called [1].

At first glance, the apple tree may seem to be quite a strong tree that bears not only fragrant, but also beautiful fruit. At the same time, the plant is quite often faced with a variety of diseases. Therefore, a huge role is played by timely and quality prevention, as well as treatment of the apple tree, if the infection is not avoided.

The tree is susceptible to many diseases and often suffers from pests. The greatest threat to apple trees is powdery mildew, Cytospora, fruit rot, black cancer, rust and others. They can be attributed to those problems that are caused by fungi. Much more rarely, the tree is faced with a viral or bactericidal infection [2].

The purpose of these tests was to establish the biological efficacy of Rihter

fungicide, WDG formulation (Captan, 800 g/kg) against apple scab (*Venturia inaequalis*). According to the plan proposed by the company, it was necessary to study and establish the biological efficacy of the product against the above diseases.

MATERIALS AND METHODS

Studies were conducted in 2022 at the experimental orchard of the Institute of Genetics, Physiology and Plant Protection of the MSU, variety ”Renet Simirenko”. The object of research was a chimical fungicide based on the captan, 800 g/kg.

Field experiments on testing fungicide against apple scab (*Venturia inaequalis)* on apple trees were conducted in apple orchard. The experiments were laid on the variety ”Renet Simirenko”, late maturity. During the growing season, the necessary agrotechnical measures were carried out in the orchard. It should be noted that in order to eliminate the influence of various factors on the results of the tested fungicide, as well as for the application of statistical methods of processing the obtained results of research, the method of randomization was used when placing the variants of the experiment. Treatments were carried out by knapsack sprayer at the rate of 1000 liters per hectare. Determination of harmfulness and biological efficacy of this preparation was carried out according to the Methodological instructions on testing of chemical and biological means of plant protection, issued by the State Centre for certification and approbation of phytosanitary means [3].

Mathematical processing of the obtained results was carried out according to the method of one-factor variance analysis with the use of computer methods of data processing on ABC Pascal platform.

RESULTS AND DISCUSSIONS

The most dangerous periods for the primary infection of leaf parsch are the phases of ”pink bud”, ”flowering” and immediately after flowering. In this regard, the main treatments were timed to these phenophases.

Under the conditions of the current year, the indicators of development and spread of parsch were at an average level in the spring period. The manifestation of the disease on leaves was noted in the second decade of May.

The degree of parsha spread on the leaf apparatus at the time of the first count in the control variant was 42.0% with the intensity of disease development of 7.8%. In the variant with application of fungicide Rihter, WDG at the rate of consumption of 1.8 kg/ha the degree of spread was 15 % with intensity of development of 2.4 %, at the rate of consumption of 2.2 kg/ha the degree of spread was 17.3 % with intensity of development of 1.9 %. With increasing the fungicide

rate to 2.5 kg/ha, the spread and development of the disease were 19.7% and 1.8%, respectively. The biological efficiency at the time of the first record for the rate of 1.8 kg/ha was 68.8 %, for the rate of 2.2 kg/ha was 75.9, and for the rate of 2.5 kg/ha was 77.2 % (Table 2).

Table 2. The biological efficacy of Rihter fungicide, WDG in reducing the development of apple scab (*Venturia inaequalis* Wint.) on leaves

№	Variant	Dosa, litres, kg/ha	Disease progress, %	Disease intensity, %	Biological efficiency, %
1	Control	-	42.0	7.8	-
2	Etalon Merpan 80 WG	2	22.0	2.0	74.5
3	Rihter, WDG	1.8	15.0	2.4	68.8
4	Rihter, WDG	2.2	17.3	1.9	75.9
5	Rihter, WDG	2.5	19.7	1.8	77.2
$HCP_{0,05}$			7.5	2.2	

Subsequent surveys during the growing season allowed to establish rather high biological efficiency of Rihter, WDG fungicide application in controlling parsley both on leaves and fruits.

During the second control recording, progression of the disease was noted. The percentage of leaf lesions was 52.3%, and the intensity of disease development was 13.5%. In the experimental variant with the application of the fungicide *Rihter WDG* at a consumption rate of 1.8 kg/ha, the degree of disease spread on the leaf apparatus was 14.3%, with an intensity of development of 1.2%. At a consumption rate of 2.2 kg/ha, the degree of disease spread on the leaf apparatus was 11.7%, with an intensity of development of 0.8%. At a consumption rate of 2.5 kg/ha, these indicators were: degree of spread, 12.7%; intensity of development, 0.8%.

The biological efficiency of Rihter WDG at a dosage of 1.8 kg/ha was 91.3%, at a dosage of 2.2 kg/ha it was 94.0%, and at a dosage of 2.5 kg/ha it was 94.3%. The biological efficiency of the chemical reference Merpan 80 WG was 93.2% at an intensity of 0.8% (Table 3).

Surveys during the harvesting period made it possible to determine the degree of development and spread of parsch on apple fruits. In the control, the level of damaged fruits was 10 % with pathogen development intensity of 0.6 %. In the variant with application of fungicide *Rihter, WDG* at a dosage of 1.8 kg/ha the degree of disease spread on fruits was 2.3 %, the intensity of disease development on fruits was 0.058 %. With the increase of fungicide dosage up to 2.5 kg/ha, the spread of disease was 1 %, with the intensity of disease development - 0.025 %.

Table 3. The biological efficacy of Rihter fungicide, WDG in reducing the development of apple scab (*Venturia inaequalis* Wint.) on leaves.

№	Variant	Dosa, litres, kg/ha	Disease progress, %	Disease intensity, %	Biological efficiency, %
1	Control	-	52.3	13.5	-
2	Etalon Merpan 80 WG	2	12.7	0.9	93.2
3	Rihter, WDG	1.8	14.3	1.2	91.3
4	Rihter, WDG	2.2	11.7	0.8	94.0
5	Rihter, WDG	2.5	12.7	0.8	94.3
HCP $_{0,05}$			6.6	3.2	

The biological efficiency of fungicide in the variant with the dose of 1.8 kg/ha was 90.7%, in the variant with the rate of consumption of 2.8 kg/ha - 96%. (Table 4)

Table 4. The biological efficacy of fungicide Rihter, WDG in reducing the development of apple scab on apple fruits

№	Variant	Dosa, litres, kg/ha	Disease progress, %	Disease intensity, %	Biological efficiency, %
1	Control	-	10.0	0.63	-
2	Etalon Merpan 80 WG	2	1.7	0.042	93.3
3	Rihter, WDG	1.8	2.3	0.058	90.7
4	Rihter, WDG	2.2	1.3	0.033	94.7
	Rihter, WDG	2.5	1.0	0.025	96.0
HCP $_{0,05}$			1.7	0.17	

Mathematical processing of the data proves that the obtained results of testing the tested doses of the drug in the control of apple parsha and moniliosis are significant in relation to the control and are not inferior in efficiency to the chemical reference Rihter, WDG.

The obtained results of testing the fungicide *Rihter, WDG* in the Republic of Moldova under the existing agroclimatic conditions indicate that the drug is quite effective against apple parsha and can be recommended for inclusion in the system of integrated crop protection.

CONCLUSIONS

As a result of the ongoing tests, the following conclusion can be drawn:

1. In the current year's climatic conditions with rainfall at 52.6% of the norm, the fungicide *Rihter WDG,* applied at rates of 1.8, 2.2, and 2.5 kg/ha, effectively inhibited the development and spread of parsha on apple trees.

2. The biological efficiency of the preparation in controlling leaf parsha

during the growing season was 80% at a rate of 1.8 kg/ha, 85% at a rate of 2.2 kg/ha, and 85.7% at a rate of 2.5 kg/ha.

3. The biological efficiency of the fungicide *Rihter, WDG*, in controlling fruit parsha was 90.7% at a rate of 1.8 kg/ha, 94.7% at a rate of 2.2 kg/ha, and 96% at a rate of 2.5 kg/ha.

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