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BIOLOGICAL EFFECTIVENESS OF FIX GOLD 70% W.D.G. AGAINST APPLE SCAB

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Abstract:

Scab is one of the most common diseases in apple orchards, the fight against which is always expensive. Untimely control of this disease leads to serious crop losses and a decrease in the quality of harvested fruits. Currently, the strategy for protecting apples from scab is based on repeated applications of fungicides. In this article, lock in gold 70% w.d.g. The results of our research on the use of fungicide are presented. According to the results of our research, Fix Gold 70% w.d.g. has the greatest biological effectiveness. In the variant treated with the norm, a fungicide consumption of 0.8 kg/ha was observed. In particular, in the leaf it was 89.77%, in the branch 87.01% and in the fruit 89.02%. Disease development was 1.8% in the leaf, 2.0% in the branch and 1.8% in the fruit.

Keywords: Apple, Disease, Scab, Fungus, Venturia Inaequalis, Control, Fungicide, Fix Gold 70% W.D.G. Biological Efficiency.

INTRODUCTION. In recent years, the quantity and quality of agricultural crops have been decreasing under the influence of harmful organisms. The reason for this is the adaptation of pathogenic microorganisms to climatic conditions and the failure to take effective measures against them in time. The development and implementation of modern measures to fight against pathogenic microorganisms allows to obtain high and quality crops from agricultural crops [9].

To improve the quality and quantity of fruits, one of the most important tasks facing gardeners is the development of various diseases caused by harmful organisms, in particular pathogenic fungi.

The climatic conditions of our republic are favorable for the development of plants and various pathogens. As a result, apple tree scab is observed annually in our orchards. Therefore, if timely countermeasures are not taken, the quality and quantity of the crop will decrease significantly.

LITERATURE REVIEW. Scab is a particularly harmful disease of apple trees, found in almost all cultivated areas. Despite the fact that activities to combat this disease are carried out annually over vast territories, the fight against it does not lose its importance. The pathogen Venturia inaequalis (Cooke) G. Winter (conidial stage of Fusicladium dendriticum (Wallr.) Fuck.) affects only apple trees, including wild species [1].

The disease damages the leaves, petals and fruits, leaf and fruit bunches of apple trees, and less frequently the pods (barks) of branches and shoots. Brown, gray or olive-green spots develop on the underside of the leaves. One to two to several hundred spots can appear on one leaf. Over time, they grow, enlarge and merge, the cells under the spot die, and as a result, the spots are visible on the underside of the leaves. Covered with spots, the leaves twist, take an ugly shape and fall off. Spots similar to those on the leaves appear on young fruits, then they turn brown, the surface becomes shriveled, and the shape of the fruit is distorted [6].

The geographical range of the fungus *V. inaequalis* is wide and it is found in almost all areas where apples are grown. It is the most important apple disease in the world in terms of economic cost of control [14]. However, in temperate climates with cool, wet weather in early spring, the disease is more severe [23; 25]. Apple scab is primarily a combination of sanitary and agrotechnical measures, as well as the correct choice of fungicides and the correct timing of application, which are necessary for effective disease control. [10; 12].

Most commercial apple varieties are susceptible to parsha [17; 18]. Therefore, to reduce the damage of the disease in gardens, a very high level of expensive control is required [10; 25]. Spring and summer fungicide spray programs are required in most traditional, integrated apple growing regions [19]. *V. inaequalis* consistently develops resistance to classes of fungicides such as dodin, benzimidazole, and quinone extrinsic inhibitor [21]. A strategy to delay the development of resistance to these fungicides in field populations of the pathogen is based on limiting the number of applications per season of each fungicide class and replacing them with fungicides that do not pose a risk of developing resistance [12; 13].

In countries such as the USA, Canada and Australia, the systems of control against parcha are aimed at protecting trees from primary infections by repeated applications of fungicides [10; 20; 24]. Depending on the development of the disease, fungicides can be applied more than 12 times per season to protect apple from rust [22]. However, due to high levels of public concern about the potential adverse effects of pesticides on human health and the environment, this practice is becoming less acceptable [11; 16].
The use of fungicides remains the best and main tool against apple scab. Fungicide spray programs may include protective fungicides with multizone activity that primarily affect pathogen spore development, such as dithianone (quinone class), captan (phthalimide class), and Bordeaux liquid (copper-based) or plant Among the systemic and absorbed fungicides, dodine (guanidine class), difenoconazole (demethylation inhibitor group; DMI), pyraclostrobin (exogenous quinone inhibitor and cyprodinil [15] including substances [16].
Chemical control measures should be started in early spring and repeated every 7-10 days in warm weather and 10-14 days in less humid weather, depending on the weather forecast. In total, it is necessary to spray fungicide 5-8 times in one season. It is always advisable to carry out the works after the rain [6].

THE METHODS OF THE RESEARCH AND EXPERIMENTAL SITE. In 2023, field experiments on the testing of new preparations against scab disease in apples were carried out at the "Extension Center" of the Tashkent State Agrarian University on the "Semerenko" apple variety.
Treatment with fungicides was carried out using a hand sprayer at the rate of 1000 kg/ha working solution, the first treatment was carried out on 21.07.2023, the second treatment was carried out on 5.08.2023.
Test experiments were carried out between 800 and 1000 in the morning, with an air temperature of 26 ºC and a wind speed of 1 m/sec.
Assessment of scab disease in apples was carried out by checking 10 trees along the diagonal of the field. In this, leaves, branches and fruits of 10 trees were observed.
Prevalence of the disease was found according to the following formula:

$$P = \frac{n \cdot 100}{N}, \text{ here}$$

P - prevalence of disease,% ;
n - number of infected plants, piece;
N - total number of sampled plants, piece [11; 13; 15; 16; 17; 22; 24].
Disease progression was calculated by the following formula:

$$R = \frac{\Sigma(a \times b) \bullet 100}{N \bullet K}$$

here, R – disease progression %; Σ(a • b) – the sum of the number of plant parts affected by the disease multiplied by the number of their points; N – total number of observed plant parts; K – the highest point in the scale [3; 4; 5; 7; 8; 26].
Biological efficiency of fungicides was determined by the following formula:

$$C = \frac{(Ab - Ba)}{Ab} * 100$$

here,
C – biological efficiency of fungicides, %;
Ab – disease progression in control option, %;
Ba – disease progression in experimental option, % [2].

THE RESULTS OF THE RESEARCH. According to the results of our experiments, the spread of the disease in the control variant was 46.0% in the leaf, 45.0% in the stem, and 35.0% in the fruit. The development of the disease was 17.0% in the leaf, 15.4% in the branch and 16.4% in the fruit (Table 1).
The highest biological efficiency in the experiment Fix Gold 70% w.d.g. 0.8 kg/ha consumption with fungicide was observed in the variant treated with the norm. In particular, it was 89.77% in the leaf, 87.01% in the branch and 89.02% in the fruit. The development of the disease was 1.8% in the leaf, 2.0% in the branch and 1.8% in the fruit.
Fix Gold 70% w.d.g. In the variant treated with fungicide at the rate of 0.6 kg/ha, the development of the disease was the same in all parts of the plant, i.e. 2.2% in the leaf, 2.2% in the stem and 2.2% in the fruit. formed The biological efficiency was 87.5% in the leaf, 85.7% in the stem and 86.59% in the fruit.

Table-1

Biological effectiveness of Fix Gold 70% w.d.g. fungicide against apple scab. (Field experience, TDAU "Information-consultation center" (extension center), apple variety "Semerenko". 07.21-08.5.2023)

№	Options	Consumption rate, l/ ha	Infected part	Disease prevalence, %	Disease development , %	Biological efficacy , %
1	Fix Gold 70% w.d.g.	0,6	leaf	9,0	2,2	87,50
			stem	10,0	2,2	85,71
			fruit	8,0	2,2	86,59
2	Fix Gold 70% w.d.g.	0,8	leaf	8,0	1,8	89,77
			stem	9,0	2,0	87,01
			fruit	7,0	1,8	89,02
3	Delan 700 g/kg w.g. (standard)	0,8	leaf	9,0	2,0	88,64
			stem	9,0	2,0	87,01
			fruit	8,0	2,0	87,80
4	Control	-	leaf	46,0	17,6	-
			stem	45,0	15,4	-
			fruit	35,0	16,4	-

In the variant treated with Delan 700 g/kg w.g. fungicide at a rate of 0.8 kg/ha, the spread of the disease up to 9.0% in the leaf, 9.0% in the stem, 8.0% in the fruit and in all parts of the plant development was observed at the same level, i.e. 2.0% in leaf, 2.0% in stem and 2.0% in fruit. The biological efficiency was 88.64% in the leaf, 87.01% in the stem and 87.8% in the fruit.
Thus Fix Gold 70% w.d.g. against apple scab. showed high biological efficiency when treated with fungicide at a rate of 0.6-0.8 kg/ha

CONCLUSION. When treated with Fix Gold 70% w.d.g. fungicide at the rate of 0.6 kg/ha, the biological efficiency was 87.5% in the leaf, 85.7% in the branch and 86.59% in the fruit. When treated with Fix Gold 70% w.d.g. fungicide at a rate of 0.8 kg/ha, the highest biological efficiency was 89.77% in leaf, 87.01% in stem and 89.02% in fruit.
The preparation form of Fix Gold 70% w.d.g. fungicide is convenient, it is easy to prepare a working solution when mixed with water and has no phytotoxic properties. It is recommended to use Fix Gold 70% w.d.g. drug against apple scab at the rate of 0.6-0.8 kg/ha 2 times.

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