Fungicide Teldor 500 SC in the fight against fruit rot in the sweet cherry plantations of Moldova

Maria Mager[1*], *Mikhail* Mager[2], and *Yuri* Dumitrash[2]

[1]State Agrarian University, 42 str. Mircesti, Chisinau, Moldova
[2]Scientific and Practical Institute of Horticulture, Viticulture and Food Technologies, 59 str. Vierul, Chisinau, MD 2070, Moldova

Abstract. The results of testing the fungicide Teldor 500 SC in sweet cherry plantations are presented. A high level of biological effectiveness was obtained in the fight against the gray rot of sweet cherry fruits.

1 Introduction

Sweet cherry (Prunus avium L.) is one of the most widespread stone fruit crops. For many countries and regions, sweet cherry is the most important fruit crop. Climate is a factor that significantly affects the production of sweet cherry fruits. Demand for sweet cherries exceeds supply almost every year. Prices are rising, but consumers are willing to pay higher prices. This factor, to a large extent, makes the cultivation of cherries more attractive compared to other types of stone fruit. [1].

In the Republic of Moldova, sweet cherry is the most important stone fruit crop. The total area of sweet cherry plantations is more than 3 thousand hectares. The yield in super-intensive plantings of sweet cherry reaches 20-25 tons per hectare [2]. The zoned assortment is 37 varieties [3]. The wide distribution of this fruit breed is explained, first of all, by its good adaptability to the soil and climatic conditions of Moldova, as well as its early maturity, high, stable productivity and excellent taste of the fruit [4].

Subject to the rules of agrotechnical care of cherry plantations, it becomes an economically beneficial and profitable crop. Crop losses due to pests and diseases necessitate a systematic implementation of plant and crop protection measures. To organize the protection of cherries, it is necessary to have detailed information on the species composition of pathogens and pests under conditions of intensification of the crop, their life cycle, developmental features, the resistance of varieties to pests, and effective means of combating them.

In the case of increased humidity caused by heavy rainfall during the ripening period of sweet cherry, water in excess enters both through the vascular system of the tree and through the leaf and skin of the fruit, causing them to crack [4]. Damage to the skin of fruits by insects, hail, etc. contributes to the defeat of the gray rot. The affected fruits fall off or remain on trees throughout the winter. In the spring, they are the source of infection. [5-9].

As known, moniliosis of pome fruit and stone fruit trees can cause several species of marsupial fungi, in the development cycle of which their anamorph usually dominates, i.e.,

* Corresponding author: magher.maria@mail.ru

asexual, or conidial stage, and the sexual stage develops very rarely and usually does not appear under natural conditions (except for M. *linhartiana*). Of these, the following four types are best known: - the causative agent of quince moniliosis *Monilinia linhartiana* (Prill. & Delacr.) N. F. Buchw. (synonym for *Monilinia cydoniae* (Schellenb.) Whetzel), anamorph of *Monilia cydoniae* Schellenb. (synonym for *Monilia linhartiana* Sacc.) [10]; - three causative agents of flower, shoot and brown rot of fruits of fruit trees, including *Monilinia fructigena* (Aderhold & Ruhland) Honey ex Whetzel, anamorph *Monilia fructigena* (Pers.ex Pers.) Eaton; - *Monilinia laxa* (Aderhold & Ruhland) Honey, (synonym for *Monilinia cinerea* (Schröt.) Honey), anamorph *Monilia laxa* (Ehrenb.) Sacc. (synonym for *Monilia cinerea* Bonorden); - *Monilinia fructicola* (G. Winter) Honey, anamorph of *Monilia fructicola* L.R. Batra [11].

Ripe fruits under optimal conditions for the development of the pathogen can rot in two days. Control over the phytosanitary state of the garden is one of the most important factors in the plant protection strategy. For many years, the search for effective means of combating fruit rot of pome and stone fruit species has been carried out [12, 13].

Based on the foregoing, the purpose of the work was to determine the biological effectiveness of the fungicide Teldor, the active ingredient of which is fenhexamide, 500 g / l, in a preparative form – a suspension concentrate. The drug belongs to the class of fungicides - *Hydroxyanilides*, which have a systemic and protective effect. It is designed to combat sulfur and monilial rot. Teldor 500 SC is not phytotoxic, not hazardous to humans and the environment. Shows long-term contact action. In Western Europe, the waiting period after spraying is 1-3 days.

2 Materials and methods

The drug Teldor 500 SC (a.i. fenhexamid, 500 g/l) submitted for testing is the first representative of a new class of fungicides with a specific mechanism of action. It inhibits the styrene biosynthesis of the pathogen.

A new formulation of fenhexamide fungicide (Teldor 500 SC) was tested against gray rot of sweet cherry fruits (Monilia cinerea Bonord) at the "Codrul" Technological Experimental Station. Cherry plantations, planted in 2015, feeding area 4x1.5 m, variety Cordia. Area – 2.3 hectares. The experience was based on 4 variants. Three replicates constitute a variant. Each replication contains 15 trees with the same crown parameters. Spraying was carried out with a sprayer of the SLV-1500 brand. Consumption of working solution 750 l per hectare. The fungicide Teldor WG 50 at a dose of 1.5 kg/ a served as a standard for comparing the development of the gray rot of sweet cherry fruits between the variants. To determine the biological effectiveness of fungicides in the fight against the gray rot of sweet cherry fruits, records were carried out on the eve of the harvest. According to the testing methodology, the biological effectiveness of the drug was determined by the ratio of the number of affected fetuses by the disease in the variant of the experiment to the control [14, 15].

3 Results and discussion

In the period from the third decade of May to the end of June, 151.1 mm of precipitation fell, which caused high soil moisture and relative air humidity, and therefore caused the skin cracking of ripening fruits and the onset of primary infection. A bountiful harvest was observed on various varieties of cherries in 2021. The high density of fruits on tree branches and poor ventilation contributed to the massive development and spread of the gray rot infection.

The first manifestation of symptoms of the fruit rot was detected on June 4 during the ripening period of a block of medium varieties of sweet cherry, which created a high infectious background in the plantings of this culture.

The experiment to study the action of the fungicide Teldor 500 SC in the fight against the gray rot of sweet cherry fruits was laid on the Cordia variety, which is relatively resistant to fruit cracking. The first, preventive, spraying of cherry trees (variety Cordia) was carried out during the period of fruit softening - June 14. However, in the control variant (without treatment), the first symptoms of damage to the fruits of this variety were found on June 21. The second spraying of the garden was carried out before the ripening of the fruits – on June 22, after a 4-day rainfall (43.5 mm).

The high relative humidity of the air, caused by precipitation from mid-June, significantly accelerated the development of the disease and rotting of fruits. Fruits, affected by the disease to varying degrees, were not subject to collection, because they were unfit for consumption (fig. 1).

1 2

Fig. 1. Cherry fruits in the control (1) and in the experimental version (2)

It should be noted that the decay of sweet cherry fruits from the moment the first signs of the disease were detected and until the complete destruction of the fetal tissues was 1-3 days. Therefore, we did not take the intensity of the development of the disease into account.

The results of the accounting carried out the day before the harvest (June 25) and the calculation of the biological effectiveness of the fungicide Teldor 500 SC in the fight against the gray rot of sweet cherry fruits are shown in Table 1.

The table shows that the spread of the disease after the application of the fungicide Teldor 500 SC significantly decreased in comparison with the control. It ranged from 6.57 % to 4.23 %, depending on the dose of the drug. In the standard, this indicator was equal to 1.57 %, while in the control, the spread of the disease reached – 54.70 %.

The biological effectiveness of Teldor 500 SC in the fight against gray rot of sweet cherry fruits ranged from 87.9% to 92.3%, depending on the dose of the drug. In the benchmark, this figure was higher and amounted to 97.1%.

Table 1. Accounting for the effectiveness of the fungicide Teldor 500 SC in the fight against the gray rot of sweet cherry fruits (Moldova, 06/25/2021)

Variants of the experience	Dose of the drug, kg, l/ha	The number of fruits in the account		The spread of the disease, %	Biological effectiveness, %
		total, pcs.	of them affected, pcs.		
Control (without treatment)	-	300 300 300	156 192 144	52.00 64.00 48.00	-
		average	164.0	54.70	-
Standart (Teldor WG 50)	1.5	300 300 300	5 6 3	1.67 2.00 1.00	96.8 96.8 97.9
		average	4.7	1.57	97.1
Teldor 500 SC	0.6	300 300 300	19 23 17	6.33 7.67 5.67	87.8 88.0 88.2
		average	19.7	6.57	87.9
Teldor 500 SC	0.8	300 300 300	13 14 11	4.33 5.67 3.67	91.7 91.1 92.3
		average	12.7	4.23	92.3

$LSD_{0,5} = 0,60$

4 Conclusion

The fungicide Teldor 500 SC was tested at doses of 0.6 and 0.8 l/ha in the fight against gray rot of sweet cherry fruits. The minimum consumption rate of the drug (0.6 l/ha) showed relatively low results in the fight against the gray rot of sweet cherry fruits. Its biological effectiveness was only 87.9%. At a dose of 0.8 l/ha, the tested drug was also inferior to the standard version and achieved biological effectiveness – 92.3 %, while in the standard, the level of crop protection was 97.1 %. The obtained test materials indicate that Teldor 500 SC can be applied 1-2 times before cherry ripening in the fight against the gray fruit rot at a consumption rate of 0.8 l/ha.

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