Measures to combat diseases of melons and watermelon in Uzbekistan

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Abstract. Today, the world's population is increasing every year. Therefore, the demand for food is also growing. Among agricultural crops, legumes are of particular importance, and each person needs to consume a certain amount of them for health. Therefore, in scientific studies conducted by scientists in countries such as China, Turkey, Iran, India, Pakistan, Russia, who are involved in police activities, various diseases caused by pathogenic microorganisms have been noted in police crops, including melons and watermelons. From these microorganisms, effective measures are being developed against root rot, fusarium wilt, verticillium, powdery mildew, downy mildew and other diseases caused by these microorganisms. As a result, the quantity and quality of multicultural crop yields increases.

1 Introduction

Watermelon is a thermophilic species among plants belonging to the gourd family, but it has low heat resistance. For the active development of the watermelon plant, the temperature should be above +15°C and this temperature should be maintained for a long time, the sum of total temperatures should be at least 2000-2500°C [1-8].

Watermelon seeds begin to germinate at +14...+16°C. When the temperature changes from +7°C to +25°C, seedlings appear in 10-22 days, at an average temperature of +20°C, in the temperature range of +15...+32°C, seedlings appear in 5-6 days will be. Also, the soil temperature at a depth of 10 cm should be at least +12...+15°C [10-14].

Diseases of melons and watermelons planted in the conditions of Uzbekistan have been studied to a certain extent, but for some reasons there are areas that have not been studied. Among them is the Republic of Karakalpakstan [9, 15-20].

According to the research of many scientists, one of the main measures to fight against diseases of agricultural crops is aimed at creating new disease-resistant varieties. That's why breeding scientists paid a lot of attention to this problem. In Israel, the resistance of the wild line of watermelon to powdery mildew and false powdery mildew was determined.

Most of the diseases detected in melon and watermelon crops infect some parts of the plants as well as their seeds. As a result, diseased seeds are an additional source of infection for next year's crops. Therefore, researchers have paid special attention to the development of measures to combat seed-borne diseases [1, 3, 21-24].

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2 Materials and Methods.

M.K.Khokhryakov methods for collecting herbarium samples from melons and watermelons infected with diseases caused by fungi, M.A. Litvinov, A.I. Dudka, S.P. Wasser, A.A. From the methods of Ellanskaya, Z.Z. Koval; by the method of N.G. Kholodnoi in the isolation of fungal species from the rhizosphere of crops growing in the fields planted with rice crops;

From the methods of N.N. Naumova, N.A. Naumov, A.Ya. Semenov, A.P. Abramova, M.K. Khokhryakov in the separation and identification of fungal species from the seeds of melon crops; in the study of internal infection sources in plant tissues, the method of "moisture" chambers was used to determine the types of fungi.

In this case, we placed them in Petri dishes in order to create favorable moisture conditions for the fungi to grow from inside the plant tissues to the outside environment and form their spores. Petri dishes are prepared in advance [4, 5, 6].

For this, filter papers are placed on the bottom of the Petri dishes, cover the upper part, cover the dish with paper and sterilize in thermostats at 120℃.

Before placing the samples, they are moistened by opening the cover of the plate in front of the alcohol burner, and then the samples are chopped in front of the alcohol burner, passed through the alcohol burner and collected under the moistened filter papers in the plates. Wrap them again in paper and put them in a thermostat (25-27℃). After 3-4 days, it is observed by opening the lid of the plate [6, 3, 7].

If fungi have grown on top of the plant cuttings, they are transferred to test tubes filled with artificial nutrient medium (of course in front of alcohols). Fungal species are identified from well-grown colonies.

In addition to studying the order of species of fungi, the purpose of our research was to determine the prevalence of diseases. Therefore, the prevalence of diseases was determined based on the following formula.

$$R = \frac{P_к \cdot 100}{N}$$

In this R-disease prevalence, in %

The number of plants in the N-experiment, pc

The total number of infected plants in the P_k-experiment, units Determining the degree of damage caused by the identified fungi was carried out by the method of artificial infection of melon and watermelon crops with phytopathogenic micromycetes.

3 Results and Discussion

One of the main goals of our scientific research work was to collect samples from melon and watermelon crops grown in field conditions of the Republic of Karakalpakstan and to identify the types of fungi.

Therefore, every year from early spring to late autumn, we observed the diseases that appeared in melon crops, checked and collected herbarium specimens from diseased plant parts [2, 8, 9].

As a result, herbarium samples collected from diseased members of melon and watermelon crops grown in the conditions of the Republic of Karakalpakstan in the course of scientific research during 2022-2023. In laboratory conditions, we identified the types of fungi using MB-1, MB-3, MB-5, binocular microscopes [7, 8].

The identified species are mainly those that live on plant debris in soil conditions or overwinter in soil conditions on diseased plant debris.

In turn, most of the mentioned species infect the sprouts of newly grown crops in spring. In addition, they actively participate in the processes of rotting the fruits of melons and watermelons. As a result, they cause a lot of damage to the fruit crop.

Fungicides were selected based on laboratory experiments to limit the growth of fungi and a list of pesticides [8, 9, 10].

Table 1. Melon and watermelon crop damage rate by fungal disease, in % (2022-2023 year)

№	The name of the disease	Incidence rate of diseases caused by fungal species of host plants, %	
		melon	watermelon
1	Fusarium wilt disease	19,1	16,7
2	Verticillosis wilt disease	5,6	7,3
3	Flour-dew disease	10,8	8,5
4	False flour-dew	6,5	3,8
5	Alternaria disease	11,0	9,2
6	Cladosporosis spotting	4,9	2,2
7	Ascochytous spotting	-	4,1
8	Fusarium root rot	12,8	11,6
9	Root rot disease caused by other fungal species	7,7	9,0

Table 2. Fungal species identified from the rhizosphere of melon and watermelon crops

№	Types of fungi	The name of the host plant:	
		melon	watermelon
1	Alternaria alternata	+	+
2	Aspergillus clavatus	+	-
3	Botrytis cinerea	+	+
4	Cladosporium herbarum	-	+
5	Fusarium oxysporum	+	+
6	Mucor plumbeus	+	+
7	Penicillium notatum	+	+
8	Rhizoctonia solani	+	+
9	Trichoderma koningi	+	-
10	Trichothecium roseum	+	+
11	Verticillium lateritium	+	+
Total: 11		10	9

As indicated above, Bist sus.k. and Trichodermin n. cook. microbiological preparations were used. To prevent root rot disease Bist sus.k. and Trichodermin n. cook treated with biopreparations on the seeds of melon crops (see Table 3).

Table 3. Fusarium wilt disease of watermelon and melon (Republic of Karakalpakstan, Kegeili district, "Aynazar Baba" f/x (2022-2023 year.)

Preparation	Damage, % after how many days:					
	15		30		45	
	watermelon	melon	watermelon	melon	watermelon	melon
Bist sus.k. 2.5 l/t seed treatment	0	0,7	0,5	4,1	4,2	8,3
Trichodermin wet.pow. seed treatment 1 g/kg	0	0,5	0,9	3,2	2,8	6,8
Control	0	3,3	3,5	13,5	10,2	22,3
EKF $_{05}$=	1,4					6,9

The next table shows the results of experiments showing the biological effectiveness of microbiological seed treatments for the protection of melon plants from fusarium wilt disease (See Table 4).

Table 4. Bist sus.k. and Trichodermin wet.pow. biological effectiveness of drugs against Fusarium wilt disease (%) (Republic of Karakalpakstan, Kegeili district, "Aynazar Baba" f/x 2017-2018 year.)

Preparation	Biological effectiveness of drugs, % after several days:					
	15		30		45	
	watermelon	melon	watermelon	melon	watermelon	melon
Bist sus.k. 2,5 l/t seed treatment	0	78,8	85,7	69,6	58,8	62,8
Trichodermin wet.pow. seed treatment 1 g/kg	0	84,8	74,3	76,0	72,5	69,7
EKF $_{05}$	1,6					4,2

As can be seen from the table data, Bist and Trichodermin drugs showed a satisfactory high effect against fusarium wilt disease at the tested rates. That is why they can be recommended to fight fusarium wilt diseases of melon crops.

4 Conclusion

In conclusion, it can be said that measures to fight against the main diseases that damage watermelon and melon from melon crops should be carried out on time and in a timely manner. The effectiveness of Trichodermin biopreparation in countermeasures was high. The biological efficacy of this biopreparation has been established and the recommendation is reasonable.

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