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EARLY BLIGHT DISEASE OF TOMATOES IN THE CONDITIONS OF THE REPUBLIC OF KARAKALPAKSTAN AND MEASURES TO COMBAT THEM

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ABSTRACT
The article provides information on tomato alternaria disease, its spread and development, as well as the importance of disease prevention in the conditions of the Republic of Karakalpakstan. The information obtained during the research can be used to develop a system for protecting tomatoes from early blight disease.
KEY WORDS: *tomato, disease, causative agent, alternaria, fungicides, biological efficiency.*

INTRODUCTION

In order to obtain a high and high-quality harvest from tomatoes, it is important to protect them from harmful organisms, including diseases, along with paying attention to high agrotechnical rules and farming culture. A number of fungal diseases have been registered in tomatoes, among them is early blight.

Early blight disease of tomatoes has become widespread in recent years, causing serious damage to tomato plants. It is recorded mainly in the republics of Belarus, Ukraine, Moldavia and the Far East, East Siberia and Central regions of the Russian Federation and many other regions [1,4,7,8,9,12].

Early blight (EB) is one of the dreadful diseases of tomato caused by several species of *Alternaria*, which includes *A. solani* and *A. tomatophila*, as well as *A. alternata*.

Pathogen Alternaria solani. under its influence, the yield of the plant decreases to 20-78% [5,10,15].
The fungus grows and develops on the diseased tissues of the plant with multicellular gray-brown mycelia and forms conidia with conidial bands on top of them.

Conidial bundles emerge from short, sparsely branched plant tops or in the form of bunches. The conidia of A.solani are 15-19 x150-300μm in size, 9 to 11 times transverse and sometimes also longtidual septate.

Plants infected with early blight develop small black or brown spots, usually about 0,25 to 0,5 inch (6-12 mm) in diameter, on leaves, stems, and fruit. Leaf spots are leathery and often have a concentric ring pattern. They usually appear on older leaves first. Spots on fruit are sunken, dry and may also have a concentric pattern; frequently they occur near the calyx end of the fruit. The entire leaf may be killed and will drop off the plant. Early blight can result in extensive defoliation, exposing fruit to sunscald and reducing yields. This disease typically progresses from base of the plant, upward.

The early blight fungus survives in the soil on residue of infected tomatoes, potatoes, and nightshade weeds. The fungus is spread by spores (oval shaped with long beak) carried by wind or splashed in water. Spores thrive in moist , warm temperatures (80-90 ^{0} F) and can persist in partially decomposed garden waste for at least a year.

RESULTS OF RESEARCH AND THEIR DISCUSSION

Herbarium samples collected from diseased parts of tomatoes served as a source during the research conducted in the conditions of the Republic of Karakalpakstan in 2023-2024.

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Diagnosis, spread and development of diseases were carried out using methods accepted in phytopathology and mycology [2,3,6,11,13,14].
Ridomil super 69% n.kuk against tomato alternaria disease during the conducted research. (1.8-2.5 kg/ha), Petrak Mz Wp 69% n.kuk. (1.8-2.2 kg/ha), Bio strobi 50% s.d.g. (0.15-0.25 kg/ha), Fastrobi 60% s.d.g. (0.15-0.25 kg/ha) fungicides were used in the specified rate.

As a model- Access 50% sus.k. (3.0 l/ha) fungicide was used. In the control option, water was used.
Experiments against early blight disease were carried out in the tomato fields of the Jaqsibai-Genjebay farm of Nukus district (table).

Table

Biological effectiveness of fungicides used against tomato early blight disease (Volgogradsky 5\95 variety, 2023-2024, Jaqsibai-Genjebai farm, Nukus district, Republic of Karakalpakstan, 2023-2024).

Experience Options	Expenditure amount kg/l to ga\l	Spread of the disease %	Development of the disease %	Biological efficiency of fungicides, %
Control (not processed)		22,4	7,2	-
Access 50% sus.k. (benchmark)	3,0	5,9	1,4	80,5
Ridomil Super % n.kuk.	1,8	7,5	2,0	72,2
	2,2	2,0	1,0	86,1
	2,5	1,7	0,7	92,8
Petrak Mz Wp 69% n.kuk.	1,8	6,5	2,2	69,4
	2,0	2,4	0,9	87,5
	2,2	1,5	0,6	91,7
Bio Strobi 50% s.d.g.	0,15	7,0	2,3	68,0
	0,2	3,0	1,8	75,0
	0,25	1,8	1,4	80,5
Fastrobi 60% s.d.g.	0,15	4,5	1,0	86,1
	0,2	2,6	0,8	88,9
	0,25	1,4	0,4	94,4

According to the obtained results, the spread of the disease in the control variant was 22.4%, the development of the disease was 7.2%.

As a model against this disease Access 50% sus.k. in the variant where fungicide was used, the spread of the disease was 5.9%, the development of the disease was 1.4%, and the biological efficiency was 80.5%.

Ridomil Super 69% n.cuk is one of the tested fungicides against tomato alternaria disease. (2.2-2.5 kg/ha), Petrak Mz Wp 69% n.kuk. (2.0-2.2 kg/ha), Fastrobi 60% s.d.g. (0.15-0.25 kg/ha) the highest results were obtained. Biological efficiency increased from 86.1% to 93.0%. Disease prevalence ranged from 1.4% to 6.7%, and disease progression ranged from 0.4% to 2.2%.

In conclusion, Ridomil Super 69% n.cuk., Petrak Mz Wp 69% n.cuk., Fastrobi 60% s.d.g. it is considered appropriate to use fungicides in the specified consumption norms.

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