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PROTECTION OF TOMATOES FROM PHYTOPHTHORA

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ABSTRACT:

Fundasol 50% WP against phytophthora disease of tomatoes. (3.0 kg / ha), Gurzat WP (3.0 kg / ha), Ridomyl Gold MC 68% WDG. (2.5 kg / ha), Fungotseb Plus68% WDG . (2.5 kg / ha), Previkur SL, 722 WDK (1.5 l / ha), Shavit F 72% WDG (2.5 kg / ha) and Bravo 50% SC. . (3.0 l / ha) The biological efficiency in the variants using fungicides ranged from 85.7% to 95.1%. One of these fungicides during the growing season 3 times; when symptoms appear in plants, it is recommended to apply at the rate of 500 l / ha working solution after 14 days of chemical treatment 1 and 2.

KEYWORDS: tomato, disease, phytophthora, Phytopthora infestans, disease progression, pest control, fungicide, efficiency, yield.

INTRODUCTION:

World population growth and year-on-year increase in demand for food products, further expansion of agricultural lands and requires a continuous supply of high quality products.

The United States, Russia, Turkey and France are the world's leading producers and exporters of tomatoes, while China, India and Uzbekistan are leading the way in Asia. Currently, one of the main and most dangerous diseases of tomatoes - phytophthora - in the common years leads to the loss of more than 80%, sometimes up to 100% of the crop when no control measures are applied to it. This disease affects all the vegetative and generative organs of tomatoes.

Phytophthora is the most common fungal disease in all tomato-growing countries of the world, including all regions of the republic.

Plant diseases caused by species of the genus Phytophthora are a constant and growing threat to cultivated plants and natural ecosystems. The literal translation of the term phytophthora is “plant destroyer” (Greek. Phyton plant, phthoros extinction, destruction, decay). The causative agent of phytophthora - the great German scientist Anton de Bari, who discovered the fungus P. infestans, gave the series this name. P. infestans were the first and only species of the genus at the time, and now it includes more than 100 species recognized by scientists. Almost every month for the next 10 years, one new species of the genus was discovered, resulting in the number of recognized species of the genus doubling during this period. At present, information on the species discovered in 10 clades belonging to the genus Phytophthora, especially after the publication of the famous monograph by Erwin and Ribeiro [9] in 1996, has been discussed [16].

The quantity and quality of tomato crop is negatively affected by many diseases, the

most important of which are alternariosis, fusarium wilt, verticillium wilt and phytophthora. Among them, the phytophthora disease of potatoes and tomatoes caused by Phytopthora infestans (Mont.) De Bary is the most dangerous, and it caused famine in Ireland in the middle of the 19th century, killing 1 million people and displacing 1.5 million people from the country. Phytophthora is the most dangerous disease of potatoes and tomatoes in both temperate and tropical countries and regions of the world [21].

The onset and intensive development of phytophthora disease is associated with air temperature and high humidity (above 75%), especially rain, fog and dew. In air temperature 26-28ºC and rainy weather, a strong development of the disease, a decrease in humidity was observed at 35-55%. Soil containing oospores can be a source of pathogenic infection in the plant [1].

The fungus P. infestans belongs to the Oomycota phylum of the Stramenopila world. The first phytophthora disease caused by this oomycete in potato crops was recorded in 1843 in Philadelphia, USA, and New York City. Its sporangia are spread by wind to neighboring states. In 1845, the pathogen reached fields in the area from Illinois to the Canadian island of Nova Scotia and from Virginia to the surroundings of Lake Ontario.

In 1845, P. infestans were introduced to Europe, mainly Belgium, with seed potatoes shipped to farmers from the United States. In the same year, phytophthora reached Ireland, where it became widespread and almost completely destroyed potato crops. As a result, 1 million people died of starvation, and more than 1 million people were forced to flee to other countries, mostly New York State. The pathogen continued to spread in later years, reaching all parts of the world in the early 20th century and beginning to destroy potato and tomato crops [13, 22].

If the P. infestans fungus appears in potato and tomato fields or in tomato crops in greenhouses and tunnels and no control measures are taken against it, it can completely destroy the crop within 7-10 days. The economic damage of the disease is characterized by a decrease in yield and quality, as well as a decrease in shelf life and the cost of fungicide spraying [10, 11].

Depending on the stage of development of the disease, crop variety and applied agro-technical measures, it is currently estimated that the loss of potato crop due to phytophthora will reach $ 6.7 billion annually [7, 12].

Use of pure phytophthora seeds against phytophthora resistant varieties with real and potential (potential) sources of infection, removal of damaged plant residues and wild-growing alternative host plants and application of fungicide spraying, intercropping and intercropping of tomatoes for 3-4 years planting is the most important [15, 17].

Many countries use mainly fungicides in the fight against phytophthora. However, the negative impact of the chemical method on the environment and the high cost of the fungicide application method require finding more economically and environmentally friendly control methods. Modern strategies to combat phytophthora are aimed at delaying the onset of epiphytosis and reducing disease progression by reducing the size of the population and the rate of pathogen reproduction [18].

MATERIALS AND METHODS:

In order to identify the fungal phytophthora disease in tomatoes, in 2017-2019, field surveys were conducted on farms in Asaka, Andijan and Balikchi districts of Andijan region. Fungicides against diseases were tested on the land of the farm "Mirza urugchilik" Andijan district.

Each fungicide tested was applied in 3 replicates, in 100 plants. Chemical treatment 3 times during the growing season; when symptoms of disease appeared in plants, 1 and 2 chemical treatments were carried out at the rate of 500 l / ha working solution after 14 days.

In determining the species composition of fungi that cause phytophthora disease of tomatoes, N.M. Pidoplichko (1977a, 1977 b), S.S. Sokhi et al. (1993), the biological effectiveness of drugs used against diseases Sh.T.

RESULTS AND DISCUSSION:

Fungi that cause phytophthora disease from diseased organs of tomatoes (leaves, stems and fruits) were isolated in the laboratory under potato-dextrose agar (KDA) in a nutrient medium, and research was conducted to determine their species composition.

The most dangerous phytophthora disease of tomatoes has been proven to be caused by the fungus P. infestans belonging to the genus Oomycota, class Oomycetes, family Pythiaceae, family Phytophthora.

The onset and intensive development of phytophthora disease is associated with air temperature and high humidity (above 75%), especially rain, fog and dew. Strong development of the disease was observed in air temperature 26-28ºC and rainy weather, a decrease in humidity when it was 35-55% [2].

According to the study, the spores of the P. infestans fungus that causes phytophthora began to grow in the KDA nutrient medium at a temperature of 5 ° C, the pathogen developed well at a temperature of 15 ° C to 25 ° C, the fungus did not develop at a temperature of 35 ° C.

P. infestans is a heterothallic organism and has two types of sexual attachment. When mycelium belonging to different sexes is added, a sexual process called oogamy occurs, resulting in the formation of an oospore. Oospores are large, thick-shelled spores that, unlike zoospores, allow the organism to survive for a long time in plant debris or directly in the soil.
[8, 14].

When the diseased members of the tomato were stored for 100 days at a depth of 20 cm under the soil, no signs of viability of the P. infestans fungus were observed on the leaves, and pathogenic fungi developed on the fruit and stem.

In order to study the effect of new fungicides against the fungus P. infestans, which causes phytophthora in tomatoes, studies were carried out in Petri dishes with potato-dextrose agar medium under laboratory conditions. Among the fungicides tested against the growth of the P. infestans pathogen, Ridomil Gold MTs in 68% WDG (mancotseb + metalaxyl), 0.3% Fundasol 50% WP (benomyl) and 0.3% Gurzat WP (tsimoxanil + copper chloroxide) showed the highest result. In this case, fungal oospores did not develop at all.

In the conditions of Andijan region in 2018 - 2019, phytophthora disease was widespread in tomato fields, the incidence of phytophthora in the first year ranged from 21.0% to 53.6%, in the second year from 21.9% to 58.0%.

Along with high agro-technical measures, the application of effective control measures against diseases and pests is one of the important factors in obtaining the planned yield from tomato plants and their quality preservation. It is also important to develop effective measures to combat diseases of the tomato plant.

Fungicides that gave high biological effectiveness against phytophthora disease of tomatoes in 2017 - 2018 were introduced in 2019 in large field experiments (table).

In experiments, Fundasol 50% WP during plant growth against tomato phytophthora disease. (3.0 kg / ha), Gurzat WP (3.0 kg / ha), Ridomyl Gold MC 68% WDG. (2.5 kg / ha), Fungotseb Plus68% WDG . (2.5 kg / ha), Previkur SL, 722 WDK (1.5 l / ha), Shavit F 72% WDG (2.5 kg / ha) and Bravo 50% SC. . (3.0 l / ha) fungicides were applied. By default, Quadris is 25% EC (0.6 l / ha) fungicide was selected.

According to the results, in the control variant with phytophthora disease tomato TMK-22 variety was affected by 45.7%, the development of the disease was up to 24.7%.

As a standard against this disease, Quadris is 25% EC (0.6 l / ha) in the variants using the fungicide, the biological efficiency reached 88.0%. The incidence was up to 5.0% and the progression of the disease was up to 2.9%.

Fundasol 50% WP against phytophthora. (3.0 kg / ha) and Gurzat WP (3.0 kg / ha) showed the highest results in the variants used fungicides. The incidence ranged from 2.0% to 3.0%, while disease progression ranged from 1.2% to 1.8%. Biological efficiency ranged from 92.6% to 95.1%.

Of the remaining fungicides, Ridomil Gold MC accounted for 68% WDG. (2.5 kg / ha), Fungotseb Plus68% WDG . (2.5 kg / ha), Previkur SL, 722 WDK (1.5 l / ha), Shavit F72% WDG (2.5 kg / ha) and Bravo 50% SC. . (3.0 l / ha) In the variants using fungicides, the biological efficiency ranged from 85.0% to 89.0%. The lesion ranged from 4.7% to 7.0%, and the progression of the disease ranged from 2.7% to 3.7%.

CONCLUSION:

In summary, Ridomyl Gold MC 68% WDG., Fungotseb Plus68% WDG ., Previkur SL, 722 s.e.c., with the onset of disease symptoms during plant growth against phytophthora disease of tomato plant. , Shavit F72% s.e.g. and Bravo 50% SC. . When one of the fungicides is chemically treated 3-4 times in a row at a rate of 500 l / ha of working solution, the yield of tomato plants is protected from disease and the quality and quantity of products increases.

Table Biological efficacy of fungicides used against phytophthora. “Mirza urugchilik” farm of Andijan region, Andijan district (variety TMK-22). 2019

T/p	Name of the drug and the active substance	Consumption rate, l / ha or kg / ha	Damage, %	Disease progression,%	Biological efficiency, %	Yield obtained, ts / ha
1.	Control – (not chemically treated)	-	45,7	24,5	-	342
2.	Gurzat WP (tsimoxanil + copper chloroxide)	3,0	3,0	1,8	92,6	581
3.	Ridomyl Gold MC 68% WDG. (mancotseb + metalaxyl)	2,5	4,7	2,7	89,0	541
4.	Fungotseb Plus68% WDG . (mancotseb + metalaxyl)	2,5	6,3	3,2	87,0	538
5.	Previkur SL, 722 WDK (propamocarb hydrochloride)	1,5	7,0	3,5	85,7	498
6.	Shavit F 72% WDG (folpet + triadimenol)	2,5	7,0	3,7	85,0	496
7.	Bravo 50% SC. (chlorothalonil)	3,0	6,7	3,4	86,1	504
8.	Fundasol 50% WP (benomil)	3,0	2,0	1,2	95,1	592
9.	Quadris 25% EC (azoxistrobin) (template)	1,0	5,0	2,9	88,0	522

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