

# MEASURES TO COMBAT DISEASES AND PESTS OF VEGETABLES AND POTATOES (IN THE EXAMPLE OF TASHKENT REGION)

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**Abstract.** This article describes harmful organisms of vegetable crops and potatoes, as well as measures to combat them in the conditions of the Tashkent region.

**Keywords:** eggs, larva, mushroom, nymph, adults, tomato moth, aphid, Alternaria, late blight, fusarium, brown leaf spot - cladosporiosis, etc.

## Introduction

Vegetables and potatoes, like other agricultural crops, are important in ensuring food safety.

In the following years, olericulture and growing potato, like all branches of agriculture, are developing, and the area of crops is expanding in all regions of our country.

Vegetables and potato crops are one of the types of crops that the population eats a lot, and they are products rich in vitamins necessary for the human body.

They are one of the food products that are constantly used by people in their daily diet.

Vegetable and potato crops are grown in all regions of the republic in peasant farms, agroclusters and private farms.

Cultivated vegetables are among agricultural products are sold not only in the internal market, but also exported to the foreign market.

According to statistics, the export of tomatoes in our country amounted to 54.2 thousand tons in January-November 2023, and a total of 409 million US dollars worth of products were sold.

However, in recent years, various diseases and pests have been observed during the growth, development, ripening and storage of vegetable and potato crops.

These include tomato moth, potato moth, aphid, spider mites, diseases such as alternaria, fusarium, phytophthora, brown leaf spot - cladosporiosis, viral and other diseases.

One of the main reasons for this is their seed production, secondly, it indicates that the agrotechnical measures carried out during the vegetation period of the plant and thirdly, the control measures against harmful organisms are not carried out promptly.

In order to prevent this, farmers, agroclusters, and private landowners must first of all identify harmful organisms in their fields in time and use the combined protection system to fight against harmful organisms in a correct way.

## Research materials and methods.

As can be seen from the table, tomato, sweet pepper and potato crops were monitored in "Nurli Dayor", "Botirjon Sahavati", Tashkent district, "Grandvillium agro" cluster, Kibrai district, "Sunnat Rakhimjon oglu", Zangiota district, "Rahim Sarvar oglu", Parkent district, "Turop" Kholtoev, "Avazjon" farms of Tashkent region.

M.K. Khokhryakov et al. (1969) determinants were used to identify diseases, collecting diseased plants and the determinants of H.L. Barnett (1968) and N.M. Pidopalichko (1977) were used to identify causative fungi. In laboratory conditions, disease-causing fungi were transferred from infected plants to potato agar and it was separated to Chapek's artificial medium based on the methodology of S.F. Sidorova (1983). Harmful insects were determined according to V.V. Yakhontov (1962) and Sh.T. Khodjaev (2019).

**Analysis and results**

As can be seen from the table data, tomato "TMK-22", pepper "Dar Tashkenta", potato varieties of "Gala" and "Arizona" were infected with fusarium wilt fungi from fungal diseases in the farms "Sunnat Rakhimjon oglu", "Botirjon Sahovati" of Tashkent region, Qibray district. These fungi greatly weaken the plant and have a great negative effect on productivity. Heavily infected plants die and have a negative effect on the quality of the existing crop (Table 1).

**Table 1**

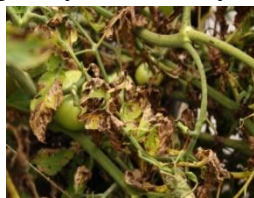
**Analysis of vegetable crops in Tashkent region**

No	Location of sampling	Plant name, cultivar	Area, hectares	Disease symptoms	Disease, causative pathogens
1.	Tashkent region, Tashkent district, "Nurli Dayor" farm	tomato, TMK-22	0.3	The lower leaves of the tomato turn yellow on one side and the plant is sluggish. The leaves become withered. The leaves hang on the branches without falling.	Fusarium wilt , <i>Fusarium oxysporum f. sp. lycopersici</i>
2.	Tashkent region, Zangiota district, "Rahim Sarvar oglu" farm	sweet pepper, Dar Tashkent variety	0.5	The leaves turned yellow, upper layer leaves started to fall, the conducting tubes of the main roots were stained, the plant began to wither.	Fusarium wilt, <i>Fusarium oxysporum f. sp. Capsicum</i>
3.	Tashkent region, Kibrai district , "Grandvillium agro" cluster	tomato, Lojan F1 variety	0.2	Leaf bands are bent downwards and leaves are drooping, spots appear on the leaves that look like scalding. It has brown and dark-brown shriveled leaves, the leaf tissue	Phytophthora , <i>Phytophthora infestans ( Mont. ) de Bari</i>

				is slightly pale and papery.	
4.	Tashkent region, Kibrai district, "Grandvillium agro" cluster	tomato, Yusupov variety	0.3	Leaf bands are bent downwards and leaves are drooping, spots appear on the leaves that look like scalding. It has brown and dark-brown shriveled leaves, the leaf tissue is slightly pale and papery.	Phytophthora , <i>Phytophthora infestans</i> ( <i>Mont.</i> ) <i>de Bari</i>
5.	Tashkent region, Parkent district, "Turop Kholtoev" farm	tomato, Madeira F1 variety	0.7	Yellow and light-green spots appeared on the lower leaves, and colorless, yellowish or light-brown spots appeared on the underside of the leaves (at the base of those spots). Severely affected leaves turn yellow-brown spots and begin to dry.	Brown spotting of the leaf - cladosporiosis, <i>Cladosporium fulvum</i> <i>Cooke.</i>
6.	Tashkent region, Parkent district, "Avazjon" farm	sweet pepper, Bolgarsky-79 variety	0.4	On the top of the fruit (where there is a flower) first appeared like a scald with boiling water, then light-brown, dry, papery spots appeared, and the	<i>Alternaria</i> , <i>Alternaria solan</i> <i>Ask</i>

				upper part of the fruit was damaged.	
7.	Tashkent region, Kibrai district, "Grandvillium agro" cluster	sweet pepper, Dar-Tashkent variety	0.3	A mosaic appears on the leaves, in which slightly raised dark-green and light-green parts are placed one after another on the leaf, the leaves are twisted and lose their shape, sometimes they become threadlike.	Tobacco mosaic, <i>Nicotiana virus I</i>
8.	Tashkent region, Qibray district, "Sunnat Rahimjon oglu" farm	potatoes, Gala variety	2.0	The lower leaves turn yellow, chlorotic spots appear on the upper ones, the top of the plant turns reddish, the roots and rhizomes are rotted.	Fusarium wilt, <i>Fusarium oxysporum f. tuberosity</i>
9.	Tashkent region, Tashkent district, "Batirjon Sahavati" f/x	potatoes, Arizona variety	1.2	The lower leaves turned yellow, chlorotic spots appeared on the upper ones, the top of the plant turned reddish, and the roots and rhizomes are rotted.	Fusarium wilt, <i>Fusarium oxysporum f. tuberosity</i>

In the process of monitoring, tomato "Yusupov" variety has phytophthora, in "Madera F1" variety brown spotting of the leaf - cladosporiosis disease, alternariosis in sweet pepper "Bolgarsky-79" variety, tobacco mosaic virus in "Dar-Tashkenta" variety were observed.



*A tomato plant affected by fusarium wilt*



*Potato plant affected by fusarium wilt*



*A tomato plant affected by brown leaf spot disease*



*Sweet pepper fruits affected by Alternaria disease*

Moreover, the presence of tobacco mosaic (TMV) (Nicotiana virus 1) from the viral disease "Dar Tashkenta" of the sweet pepper variety planted in the "Grandvillium agro" cluster of Kibrai district, Tashkent region was found.

It was also observed that potatoes were damaged by the Colorado potato beetle, tomatoes were partially damaged by the tomato moth, and aphids.



*A potato plant  
damaged by the  
Colorado potato  
beetle*



*A potato plant  
damaged by the  
Colorado potato  
beetle*



*Tomato fruit  
infested by tomato  
moth*



*Tomato plant  
infested with aphids*

Adequate recommendations were given to farmers on agrotechnical measures and coordinated fight against harmful organisms identified as a result of monitoring.

In particular, in order to keep each type of crop within the criteria of economic damage caused by harmful organisms, it is necessary to carry out agrotechnical measures in time and with high quality ( *selection of land, crop rotation, fertilization, cultivation of seedlings* , preparation of the land for planting , planting time, thickness and scheme, care, watering, etc. ) and it is necessary to carry out the coordinated control measures against harmful organisms promptly.

It can be seen that agrotechnical measures and integrated pest control measures are linked to each other.

In the absence of organic links in such agrotechnical and countermeasures, the fertility of vegetable and potato crops decreases, the nutritional and nutritional quality of the product decreases, the resistance of the plant to harmful organisms decreases, and the vegetable and potato crops remain vulnerable to subsequent reproduction.

### **Recommendations**

1. During the growing season of vegetables and potatoes, it is necessary to carry out agrotechnical activities in time and qualitative manner.

2. In the field, it is not recommended to plant vegetables and potatoes belonging to the same family (tomatoes, eggplants, sweet peppers, potatoes, etc.) and one type of vegetable and potato crops for several years consequently (tomatoes next year after tomatoes or potatoes after potatoes).

3. In a Fusarium disease during the growth period of the plant spraying with a base drug " Pseudomonas putida Pp-1" is recommended.

4. It is recommended to spray azoxystrobin + difenoconazole , mancoceb + tricyclazole, propamocarb hydrochloride, propamocarb hydrochloride + cymoxanil, x lorothalonil base in a alternariosis disease, benomyl to cladosporiosis basic, metalaxyl to phytophthora, mancoceb + mfenoxam, mancoceb + metalaxyl M, propamocarb hydrochloride + cymoxanil, chlorothalonil, with preparations based on azoxystrobin, dimethomorph + folpet in a brown leaf spot disease during the growth period of the plant.

5. In the event that a plant infected with a viral disease is observed during the cultivation of fields, tools and equipment must be disinfected, the heavily infected plant must be pulled out and burned outside the field.

6. It is recommended to use pheromone traps to monitor the spread of tomato and potato moths. This method is of great importance in determining the distribution and development of pests in nature, and as a result, biological or chemical control measures against it are recommended.

7. For pests it is recommended to use acetamiprid, alphacypermethrin, imidacloprid, imidacloprid + alpha-cypermethrin, imidacloprid + lambda-cyhalothrin, dinotefuran, lambda-cyhalothrin + acetamiprid, fipronil + imidacloprid based, tomato moth abamectin, acetamiprid, imidacloprid, thiamethoxam + imidacloprid + lambda - cyhalothrin, emamectin benzoate, cyantraniliprole , and diafenthiuron based substances.

The use of any chemical means should be stopped 30 days before harvest.

#### Summary

Timely and qualitative implementation of agrotechnical measures and integrated control measures against harmful organisms in the cultivation of agricultural products is of great importance.

As a result of this, the quality of the harvested crop will improve, the gross yield will increase and the economic efficiency will increase.

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