



## Brown spotting *Cladosporiumfulvum* Cooke of tomato

J.T.Aghayev

Azerbaijan Scientific Research Plant Protection Institute

### Abstract

The article provides information about spread of Cladosporioz, features, degree of development, exposure routes, and the results of research on effectiveness of biological and chemical preparations tested against disease.

**Keywords:** Protected ground, tomato, disease, *Cladosporiumfulvum*, biological control.

### Introduction

From the observation held in large greenhouses protected ground vegetable-growing in Zikh of Apsheron Peninsula it was clear that some years of out of turn tomato growing caused to specialization of Kladosporiozon plant. From the kept records we can see that during 28-35 days all leaves have been infected with Cl. Licopersici and burnt (pic1, 2.).



Picture1.



Picture2.

### Materials and Methods

The infectious agent is *Cladosporiumfulvum* Cooke. Fulviafulva-the synonym of pathogen is recorded on the tomato in a greenhouse. *Cladosporium* infects open and closed leaves, butt, stem, calyx, calyx lobe and fruit. First signs are observed on the top of lower tier of leaves as light-green, then with yellowish spots. Later in the bottom of these spots are formed as brown dots the carriers of conidiums and conidiums offungi. And it plays the main role in the spread of disease. It is possible to spread by water drop or wind shortly. The relative humidity of air must be 80-95%. The foggy morning and evening weather is favourable for spread of disease. Because of high humidity in the greenhouses the disease is widespread in the polyethylene covered greenhouses. *Cladosporiose* is widespread in Azerbaijan regions. It was found that during its development the pathogen creates different races and subspecies. It occurs when pathogen lives in the soil as a saprophyte. Pathogen falls onto the soil in the plant remains and conforms to saprophyte circumstances. It widens its breeding area under favourable conditions. Because of this feature the development of sustainable varieties and their use are not successfully. The main role in the spread of *Cladosporiose* play conidiums which create brown cover on the yellowish spot appeared in the bottom of the leaf. Conidiums are viewed on the branched carriers of conidiums, they are round or egg shaped and they have 1-5 cells. The membrane colour of conidiums is light brown, intracellular colour is whitish-grey.

## Results

Sizes: unicellulars are 4-7x6-9 mkm, bicellulars are 5-8x10-14 mkm, with 3-5 cells are 6-10x13-29 mkm. The disease develops on the tomato. So the producers cannot fight against the disease. Although they use the fungicides with different contact source the profit is too low and it does not satisfy the producers, the economic damage increases. Against the brown spotting *Cladosporium* are used the systems, or fungicides with system or contact effect. With this end of view they use the fungicides with substances Metalaxyl, Iproion, Triadimefon, Mefenoksam, Azoksistrobin and get a high productivity.

In 2012-2013 to improve the chemical fight measures Poliram (350 gram/kg Metiram), Ridomil Qold (Mankozeb 640 gram/kg + Mefenoksam 40gram/kg), Kbadris CK (Azoksistrobin 250 gram/kg), Kaptan-H, Enerkol (70% Propineb), Tivoksin AL (50% Polioksin), Hektaneb M-22 (80% Maneb) have been tested, the biological efficiency of these fungicides have been studied. Among the tested fungicides' normally use as Kvadris CK a litre/ha was 85,7%, Tivoksin AL's normally use 83,9% was 0,5 liter/ha and showed higher results than others.

The biological productivity of other preparations used against the disease was as following:

-Ridomil gold 3 kg/ha with the standard norm of 80%, Kaptan H 3kg/ha with the standard norm of 71%, Enerkol 4,5kg/ha with the standard norm of 78,5%, Hektaneb M -223kg/ha with the standard norm of 73,2%, Poliram 3kg/ha with the standard norm of 75% (table 1).

**Table 1: The productivity of fungicides against Brown spotting *Cladosporium fulvum* Cooke of tomato (*Cladosporium fulvum* Cooke). Station: Zira private greenhouse, Durinta F1.**

Name of preparations	Expense norm kg/ha, litre/ha	Spread,%	Intensity,%	Biological productivity, %
Ridomil-Qold	3	35	11	80
Kvadrisk CK	1	32	8	85,7
Kaptan H	3	40	16	71,4
Enerkol	4,5	38	12	78,6
Tivoksin AL	0,5	28	9	83,9
Hektaneb M 22	3	46	15	73,2
Poliram	3	30	14	75
Etalon: Antrakol WP70	3,5	34	15,5	76,8
Control: measure was not taken.	--	92	56	-

## Conclusion

Because of long term of yield ripening and collecting period (50-65 days) during this period have been used the chemical preparations against *Cladosporiose*, because of increasing pesticide remains in the composition and decreasing of marketable quality of yield must be used biological fight measures. With this end of view in some scientific sources Pseudobakterin-2 (*Pseudomonas aureofaciens* Stamm: BCB 93, titer:  $5 \cdot 10^{11}$ ) was efficiently and so was studied its productivity against *Cladosporiose* (2). The carried out tests show that twice use of Pseudobakterin-2 with 7 days interval with the standard norm of 0,03 kg/ha was productive of 75%. The result is considered as satisfactory and its use is advisable.

So, by using of the phytosanitary measures, use of chemical and biological fungicides with system effect could be used the following measures against *Cladosporiose* of tomato:

### 1. Phytosanitary and agrotechnical measures:

- keeping of optimal climate condition (the relative humidity of weather of 65-75%, temperature 18-22°C)
- take measures on water drops in polyethylene covered greenhouses.
- refusal of artificial rain.
- use of drip irrigation and growing of rows and intervals between plants.
- clearing of plant remains and weeds, their private for decreasing of pathogen resources.
- apply of regular sowing system.

2. Chemical fight measures must be stopped 15 days before ripening of fruit in the first tier. So the composition of Azoksistrobin and polioksin are more productive. It means that Kvadrisk CK with the norm of 1 litre/ha, Tivoksin AL with the norm of 0,5 litre/ha can be used both seed-plot and productive area. The expense of working solution must be 400 litre/ha in productive area and 1 litre in 10m<sup>2</sup> seed-plot. During the application the preparations must be replaced, so it helps to prevent the creation of sustainability of pathogen to fungicides and increases the efficiency of fight.

3. Biological fightmeasures.To keep in control the plant during its ripening use of the preparations of Psevdobakterin-2 with the norm of 0,03 kg/ha, EWS must be 400litre/ha. From ecological view during the safety yield regulary use of Psvdobakterin-2 with 250 gram of Qamair İT (*Bacillus subtilis*, ştam M-22 VİZR, titre  $10^{10}$ kyo/gram), 250-300 gram Alrin-B (*Bacillus subtilis*, ştam B-10 VİZR, titre 10 kyo/gram) gives an opportunity to get a yield with no pesticide and gives high productivity.

## **References**

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