وزارة التعليم العالي والبحث العلمي

جامعة الانبار / كلية الزراعة

قسم وقاية النبات

(امراض خضر - Vegetable diseases)

المرحلة الرابعة Fourth stage

قسم وقاية النبات Plant Protection Dept.

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3-Fusarium wilt of Potato and tomato -1

Importance:

It is considered a tomato disease, where the causative agent can live in the soil for a long time, especially in light soil, and kills many seedlings in the nursery.

Favorable conditions:

1- Relatively low ground moisture.

2- The appropriate temperature for the propagation of fungi is approximately 25-30° C.

3- light sandy soil.

4- Spread of nematodes in the soil.

Symptoms:

1- Yellowing of the lower leaves of the affected plants, then their wilt and dryness, then the infection extends upward until it reaches the top of the plant, and the whole plant withers and dies.

2- Symptoms appear on one branch of plants without the other branches, then the symptoms of the disease gradually move to the upper leaves and often these symptoms appear on one side of the plant.

Symptoms of tomato fusarium wilt disease

Pathogen:

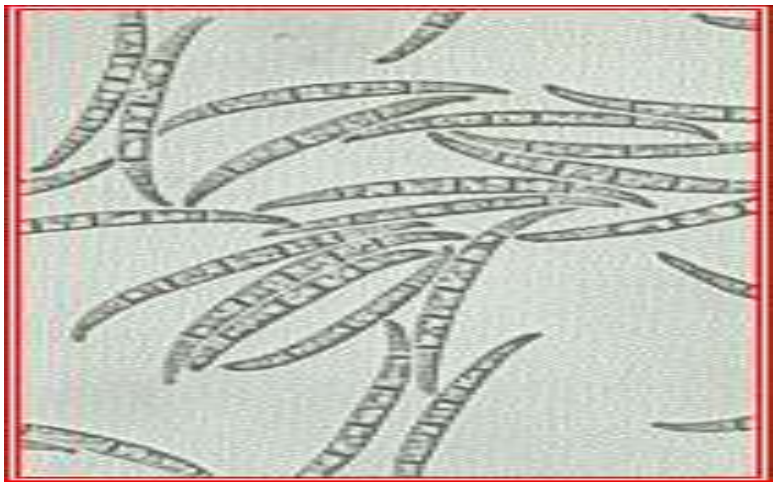
Fusarium oxysporum f.sp.*lycopersici*

It follows the imperfect fungi and forms three types of asexual spores:

First: Microconidia is a colorless, oval, single-celled or two-celled conidi

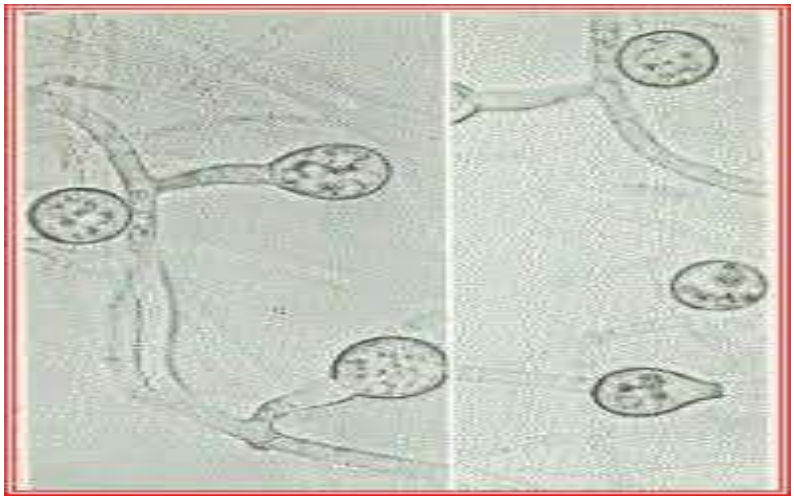
Fusarium oxysporum **Microconidia**

Second: Macroconidia, colorless, sickle-shaped, pointed with two ends, consisting of 2 to 6 cells.



Macroconidia

Third: Chlamydospores are thick-walled blackboards that form terminally or intertwined on the mycelium or large conidia and are single or in the form of chains.



Chlamydospores

Disease cycle:

1- Small conidia form inside wood vessels in infected plants, and when the plant dies and leaves its remains in the soil, the mycelium of the fungus grows on the surface of the dead tissues, where small and large conidia are formed.

2- It gives germination tubes and a mycelium that can penetrate the root directly through the growing tops or tubes that expose secondary roots or through wounds. Then the mycelium spreads transversely until it reaches the woody vessels during pecking.

3- It spreads in it and moves upwards until it reaches the stem and leaves. It is believed that the wilting of tomato plants is due to the loss of more water than it is absorbed, in order to increase the resistance that the water finds to climb inside the stem wood vessels or the petioles of the leaves.

Control:

1- Use certified seeds of tomato, pepper, eggplant or potato tubers.

2- Cultivation of varieties resistant to the pathogen.

3- Leaving the soil of the field uncultivated and plowing it during the months of July and August to take advantage of the heat intensity in killing the causative fungi as well as snake worms that increase the severity of the infection.

1- Regular irrigation and not thirsting the plants so as to give the affected plants an opportunity to complete their growth and fruition.

4-Black scurf of potato Rhizoctoniose

Economic importance:

1- It is one of the diseases that cause problems in potato crops, as it results in a delay in germination, affects the growth of plants, and reduces the quality and weight of tubers.

2- The fungus infects tomato fruits and potato tubers, and causes many diseases on plants of the Solanaceae family.

Symptoms:

1- The infected symptoms appear on coarse brown or black scales that are stone bodies of the pathogen. These scales resemble clay granules attached to the tuber and are superficial, but they cannot be removed by washing.

2- Infection of the stems, so they appear in the form of reddish-brown ulcers at the soil level or above, causing the death of the cortex tissues.

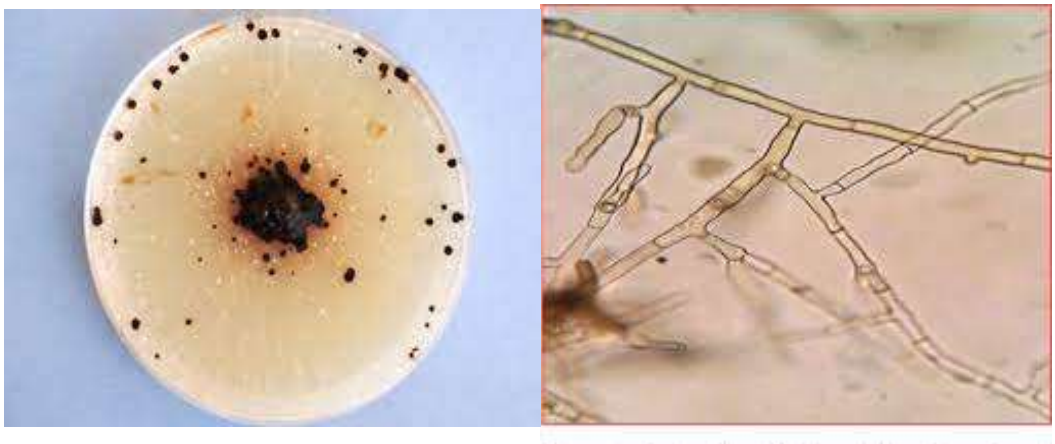
Symptoms of Rhizoctoniose rot disease in potatoes

Pathogen:

1- The disease is caused by the fungus ***Rhizoctonia solani***, a sterile Mycelia sterilia.

2- Follow the imperfect fungi The fungus is characterized by the formation of thick-walled divided brown hyphae branching at almost right angles and there is always suffocation at the points of branching.

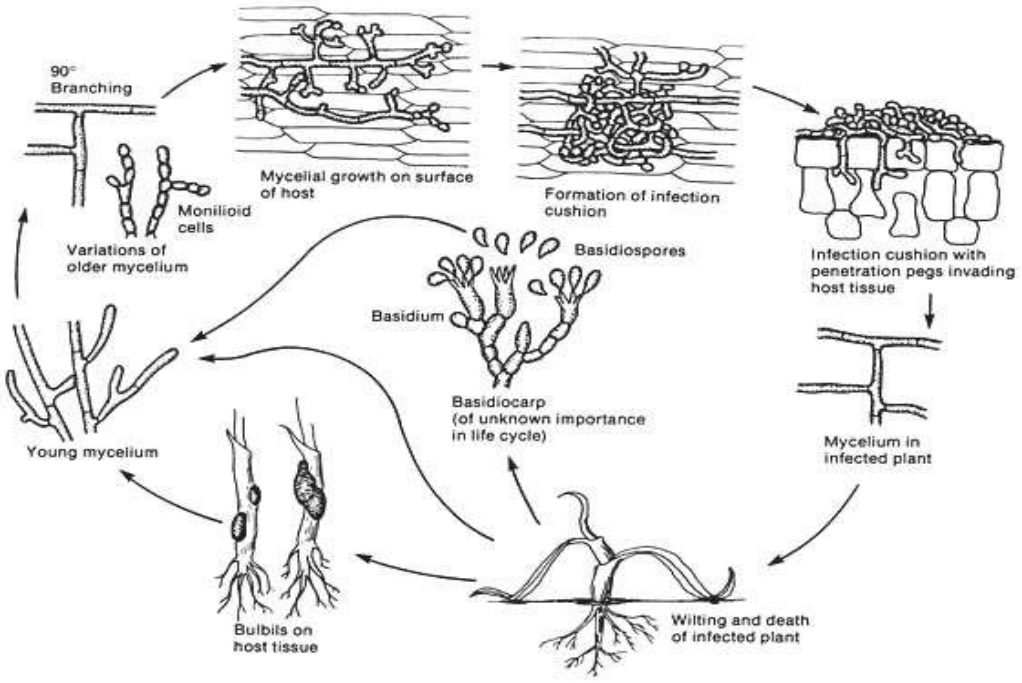
3- The fungus forms sclerotia which are assemblies in the form of scales. This fungus has a complete sexual phase known as ***Thanatephorus cucumeris*** that follows the Basidiomycetes, but it has not appeared so far in Iraq.



Rhizoctonia solani

Disease cycle:

1- The fungus spends the winter in the form of mycelium and stone bodies on potato tubers or in the soil.
2- Fungi can also grow by throwing up and extending large distances in the soil without the presence of the host.
3- The best growth of the pathogen, the available humidity and moderate temperatures that tend to drop 18 ° C ,
4- When the right conditions are available, the stone bodies germinate and give a filamentous mycelium resembling a spider's thread that penetrates the developing tops of the new branches directly and grows between the cells, causing them to be killed.
5- Secretions, toxins and enzymes. When plant stems are infected, fungus toxins spread through cells even before the hyphae reach them.



Disease cycle *Rhizoctonia solani*

Control:

1- Selecting healthy tubers that do not show symptoms of infection.
2- Disinfecting the seeds before planting them by dipping them in a 0.05% formalin solution for one and a half to three hours.
3- Follow the agricultural cycles, which include small grain crops.
4- Sowing potato tubers in the light for a week first before planting them, as these new green growths are more resistant to infection by the causative fungus.

References

1. Agriose, G. 2004. Plant Pathology. Fifth Edition .Academic Press.

2.https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/fusarium

3.https://www.britannica.com/science/plant-disease

4.https://extension.umaine.edu/ipm/plant-disease/

5.https://bsppjournals.onlinelibrary.wiley.com/journal/13653059