B.Sc. Third Year, Semester - V

Botany Paper No. XVI (C)

Plant Pathology Unit-2

3) Plant Diseases of Vegetables

c) Black rot of onion

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c) Black rot of onion

Causal Organism: ***Aspergillus niger***

Host: ***Allium cepa*** **(onion)**

- **Classification**
- **Division-** **Mycota**
- **Sub Division-** **Eumycotina**
- **Class-** **Ascomycetes**
- **Sub class-** **Euascomycetidae**
- **Order-** **Aspergillales**
- **Family-** **Aspergillaceae**
- **Genus-** ***Aspergillus***
- **Species-** ***niger***

Distribution

This disease can be of great economic importance in warm conditions. Seedlings and young plants are more susceptible to the pathogen. Diseased areas of the effected plant are covered in dark fungal growth. Infection of seedlings commonly occurs soon after germination.

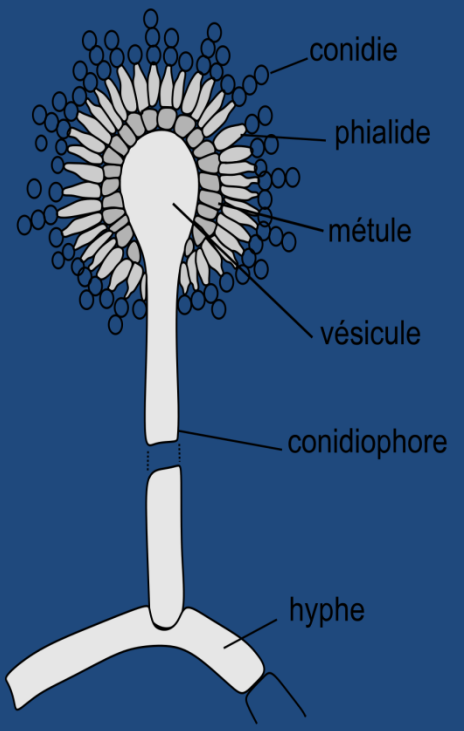
Symptoms:

1- Infection through neck tissues as foliage dies down at maturity.

2- Infected bulbs are discolored black around the neck and affected scales shrivel.

A) Healthy Onion

B) Infected Onion



Symptoms:

The disease progresses rapidly, and most affected plants will die within 30 days of planting. Infected onion bulbs have a black discolouration at the neck, shallow lesions on the outer scales, streaks of black mycelium and conidia beneath the outer scales and a black discolouration in bruised areas. The entire surface of the bulb may turn black, in which case, the onion will shrivel and secondary bacteria may cause a soft rot of the bulb.

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Causal organism and disease cycle:

The disease is caused by ***Aspergillus niger***. It is a filamentous fungus is responsible for black rot of onion. This fungus is very common in the atmosphere and in the soil and is often found as a saprophyte. Infection will usually occur though damaged tissue. The disease is usually more severe on those crops grown in a continuous rotation of susceptible hosts. Warm, moist conditions favour the growth of this fungus. Adverse weather conditions, extreme fluctuations in soil moisture, poor seed quality, seedling damage by pesticides and other factors that delay seedling emergence have been shown to increase susceptibility of plants to the pathogen. Older plants are more prone to infection, especially in dry soil. Seeds may be infected causing damping-off, and the fungus is also spread on seed. Postharvest decay is favoured by humid conditions which encourage conidial development on the cut tissue.

Control measures:

Fungicide seed treatments may be effective when used under conditions that promote rapid germination and emergence to prevent damping off. Post-harvest black rot can be controlled if produce is stored and transported below 15°C or under very low humidity. The disease is minimised by reducing the amount of physical damage to the storage organs.

It was observed that all the fungicides caused significant reduction in the mycelial growth, lesion diameter, spore germination and rot severity. Amongst systemic fungicides, carbendazim brought about highest reduction followed by hexaconozole, bitertanol and myclobutanil, respectively. Amongst non-systemic fungicides, the mancozeb was found the most effective followed by captan and zineb, respectively. The higher concentrations (1000 ppm and 2000 ppm) of all the fungicides proved more effective.

Thank you