Onion black mould (187)

Common Name
Black mould, collar rot, neck rot

Scientific Name
Aspergillus niger

Distribution
Worldwide. Asia, Africa, North and South America, the Caribbean, Europe, Oceania. In soils, and on decaying vegetable matter. On onions, it is recorded from Australia, Fiji and New Zealand; Aspergillus niger is also recorded from New Caledonia (garlic), Papua New Guinea (cassava, citrus, peanut, rice soil), Solomon Islands, (Piper leaves, rice), and Vanuatu (peanut).

Hosts
Coconut, garlic, maize, onion, peanuts, rice, and sorghum, and many other hosts. Globally, seeds, bulbs, tubers, fruits and flowers are hosts.

Symptoms & Life Cycle
The fungus is common in soil as a saprophyte, meaning it lives on dead or decaying organic matter, but it is also an "opportunistic pathogen", that is, it will begin by living on dead or dying tissues and then extend to tissues that are still alive. This is particularly so in the case of stored fruits, seeds, roots and tubers.

On onions, the fungus occurs on or between the outer scale leaves of the bulbs, especially along the veins (Photos 1&2). It can be severe with the surface covered in black spores masses, and rots developing at the neck and sides. On garlic, a dry rot develops, associated with dark brown to black spores masses (Photo 3).

The fungus survives in the soil living on crop remains and any other decayed plant material. Spread occurs as spores blown in the wind. These may land on the dying leaves of plants in the field, especially during periods of rain, and infect them. Infections from the leaves spread to the bulbs. Bulb infection in the field is usually associated with injury. For infection of the onion surface, water and high humidity is required for 6-12 hours. Spread may also occur on seed, and on seedlings. Spores of Aspergillus niger are common on seed grown in hot dry climates.

Impact
The damage caused by Aspergillus niger is mostly cosmetic affecting the quality of onion or garlic bulbs. However,
it is also a wound pathogen. When bulbs are "topped" to seal the necks before storage, *Aspergillus niger* gains entry to wounded tissue, and rots develop, especially during warm to hot humid weather.

Black mould has been reported causing major rots of stored onions in the USA and in Japan when kept at high temperatures (27°C) and more than 70% relative humidity. Heavy losses have also been reported from the Sudan.

**Detection & Inspection**

Look for the dark powdery masses of spores on garlic, or on the outer scale leaves of onion, especially along the veins or on the neck.

**Management**

**CULTURAL CONTROL**

**Before planting:**

- Use a 2-3-year rotation between successive crops of onion and its relatives on the same land. Rotate with crops that do not belong to the onion family.
- Choose land with good drainage.
- Ensure that seed is "clean", i.e., free from spores, and that transplants are healthy. If you are not sure about the quality of the seed, treat it with hot water at 60°C for 15 minutes.

**During growth:**

- Do not harvest crops during wet weather.

**After harvest:**

- Collect and burn all the debris from the harvest.
- Carefully dry bulbs after harvest and before storage and marketing. In hot climates, make sure that the humidity is below 80%.

**RESISTANT VARIETIES**

Varieties of onions with red scale leaves tend to be more resistant to *Aspergillus niger* due to the presence of phenolic compounds that have antifungal properties.

**CHEMICAL CONTROL**

First priority should be to control the disease using cultural methods. If fungicides are needed for seed treatment, use mancozeb or thiram.