



FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

**DISEASES OF FIELD&HORTICULTURAL CROPS&
Management 1 PPA - 312**

LECTURE 08

4. Diseases of Pearlmillet

Downy mildew - *Sclerospora graminicola*

Symptoms

Infection is mainly **systemic** and symptoms appear on leaves and inflorescence. The initial symptoms appear in seedlings at three to four leaf stages. The affected leaves show patches of light green to light yellow colour on the upper surface and the corresponding lower surface bears white downy growth of the fungus consisting of **sporangiophores** and **sporangia**. The yellow discolouration often turns to streaks along veins. As a result of infection young plants dry and die ultimately. Symptoms may appear first on the upper leaves of the main shoot or the main shoot may be symptom free and symptoms appear on tillers or on the lateral shoots. The inflorescence of infected plants gets completely or partially malformed with florets converted into leafy structures, giving the typical symptom of **green ear**. Infected leaves and inflorescences produce sporangia over a considerable period of time under humid conditions and **necrosis** begins.



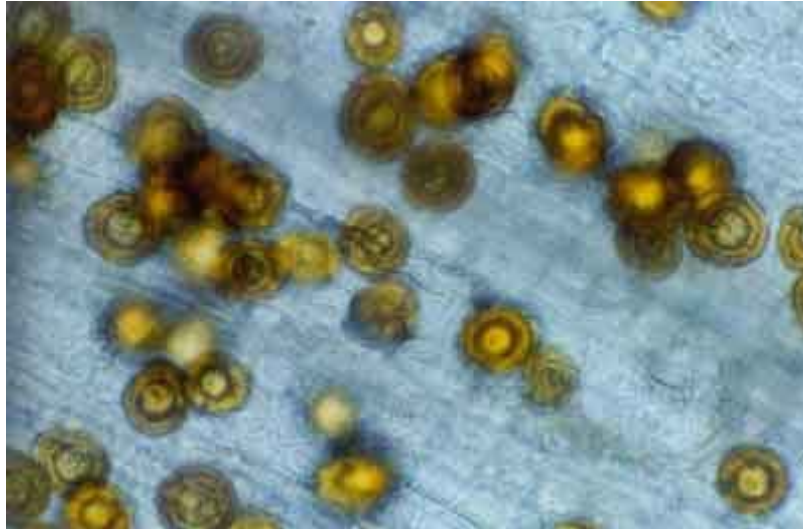
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Infected leaves and inflorescences produce sporangia over a considerable period of time under humid conditions and **necrosis** begins. The dry necrotic tissues contain masses of **oospores**.



Pathogen

The mycelium is systemic, non septate and **intercellular**. Short, stout, hyaline **sporangiophores** arise through **stomata** and branch irregularly, with stalks bearing **sporangia**. Sporangia are hyaline, thin walled, **elliptical** and bear prominent papilla. **Oospores** are round in shape, surrounded by a smooth, thick and yellowish brown wall.



Favourable Conditions

- ☐ Very high humidity (90%).
- ☐ Presence of water on the leaves
- ☐ Low temperature of 15-25°C favor the formation of sporangiophore and sporangia.

DISEASE CYCLE

The oospores remain viable in soil for 5 years or longer giving rise to the primary infection on seedlings. Secondary spread is through sporangia produced during rainy season. The dormant mycelium of the fungus is present in embryo of infected seeds.

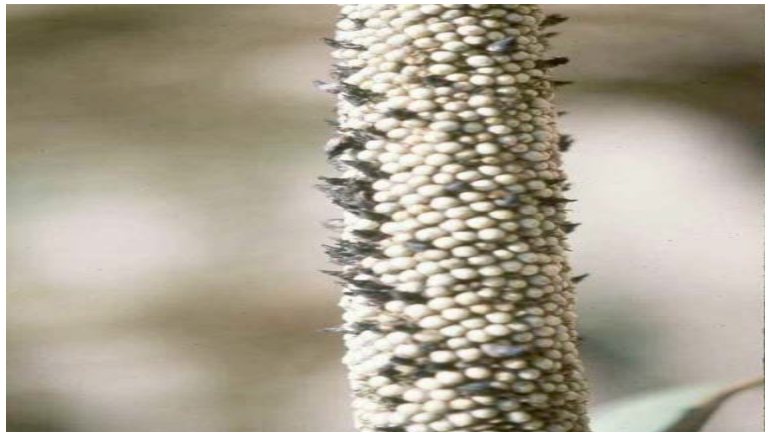
Management

- ☐ Deep ploughing to bury the oospores.
- ☐ Roguing out infected plants.
- ☐ Adopt crop rotation.
- ☐ Grow resistant varieties WCC-75, Co7 and Co (Cu)9.
- ☐ Treat the seeds with Metalaxyl at 6g/kg.
- ☐ Spray Mancozeb 2 kg or Metalaxyl + **Mancozeb** at 1 kg/ha on 20th day after sowing in the field.

Ergot or Sugary disease - *Claviceps fusiformis*

Symptoms

The symptom is seen by exudation of small droplets of light pinkish or brownish honey dew from the infected spikelets. Under severe infection many such spikelets exude plenty of honey dew which trickles along the earhead. This attracts several insects. In the later stages, the infected ovary turns into small **dark brown sclerotium** which projects out of the spikelet.



Pathogen

The pathogen produces septate mycelium which produces **conidiophores** and is closely arranged. **Conidia** are hyaline and one celled. The **sclerotia** are small (3-8mm x 0.3-15mm) and dark grey but white inside.

Disease cycle

Sclerotia are viable in soil for 6-8 months. The primary infection takes place by germinating sclerotia present in the soil. Secondary spread is by insects or airborne conidia. The role of collateral hosts like *Cenchrus ciliaris* and *C. setigerus* in perpetuation of fungus is significant. The fungus also infects other species of *Pennisetum*.

Management

- ☐ Adjust the sowing date so that the crop does not flower during September when high rainfall and high relative humidity favour the disease spread.
- ☐ Immerse the seeds in 10 per cent common salt solution and remove the floating sclerotia.
- ☐ Remove collateral hosts.