



FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

DISEASES OF FIELD CROPS PPA - 301

LECTURE 10

1. Dry root rot - *Macrophomina phaseolina*

Symptoms

The disease symptom starts initially with yellowing and drooping of the leaves. The leaves later fall off and the plant dies within a week. Dark brown lesions are seen on the stem at ground level and bark shows shredding symptom. The affected plants can be easily pulled out leaving dried, rotten root portions in the ground. The rotten tissues of stem and root contain a large number of black minute sclerotia.



Pathogen

The fungus produces dark brown, septate mycelium with constrictions at hyphal branches. Minute, dark, round sclerotia are in abundance. The fungus also produces dark brown, globose ostiolated pycnidia on the host tissues. The pycnidiospores are thin walled, hyaline, single celled and elliptical.

Favourable conditions

- Day temperature of 30°C
- Prolonged dry season followed by irrigation.

Disease cycle

The fungus survives in the infected debris and also as a facultative parasite in soil. The primary spread is through seed-borne and soil-borne sclerotia. The secondary spread

Symptoms

is through seed-borne and soil-borne sclerotia. The secondary spread is through pycnidiospores which are air-borne.

Management

- Treat the seeds with Carbendazim or Thiram at 2 g/kg or pellet the seeds with *Trichoderma viride* at 4 g/kg or *Pseudomonas fluorescens* @ 10g/kg of seed.
- Apply farm yard manure or green leaf manure (*Gliricidia maculata*) at 10 t/ha or neem cake at 150 kg/ha.

2. Leaf spot - *Cercospora sojiana*

Symptoms

Light to dark gray or brown areas varying from specks to large blotches appear on seeds. The disease primarily affects foliage, but, stems, pods and seeds may also be infected. Leaf lesions are circular or angular, at first brown then light brown to ash grey with dark margins. The leaf spot may coalesce to form larger spots. When lesions are numerous the leaves wither and drop prematurely. Lesions on pods are circular to elongate, light sunken and reddish brown.

Symptoms

Favourable conditions

- Fungus survives in infected seeds and in debris.
- Warm, humid weather favor disease incidence

Management

- Use resistant varieties.
- Use healthy or certified seeds.
- Rotate soybean with cereals.
- Completely remove plant residue by clean ploughing the field soon after harvest.
- Destroy last years infected stubble.
- Seed treatment with Thiram + Carbendazium (1:1) @ 2g/kg seed.
- Spray Mancozeb @ 2g/L or Carbenzadium (500 mg/L).

3. Mosai - *Soybean mosaic virus* (SMV)

Symptoms

Diseased plants are usually stunted with distorted (puckered, crinkled, ruffled, narrow) leaves. Pods become fewer and smaller seeds. Infected seeds get mottled and deformed. Infected seeds fail to germinate or they produce diseased seedlings.

Pathogen

It is caused by *Soybean mosaic virus* - a **potyvirus**. **Flexuous** particles 750 - 900nm long, **ss RNA genome**

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Symptoms

Disease cycle

Soybean mosaic virus is seed borne. The SMV can be transmitted through sap, 32 aphid species are involved in transmission.

Favorable conditions

- Temperature around 18°C
- Humid weather.

Management

- Deep summer ploughing.
- Use resistant or tolerant varieties.
- Use healthy/certified seeds.
- Keep the field free from weeds.
- Rogue out infected plants and burn them
- Pre-sowing soil application of **Phorate** @ 10 kg/ha.
- Two foliar sprays of **Thiamethoxam** 25 WG @ 100 g/ha or **Methyl demeton** 800 ml/ha at 30 and 45 days after sowing.