

## 12. Diseases of Sesamum

**Root rot or stem rot or charcoal rot - [\*Macrophomina phaseolina\*](#) (Sclerotial stage: [\*Rhizoctonia bataticola\*](#))**

### Symptoms

The disease symptom starts as yellowing of lower leaves, followed by drooping and defoliation. The stem portion near the ground level shows dark brown lesions and bark at the collar region shows shredding. The sudden death of plants is seen in patches. In the grown-up plants, the stem portion near the soil level shows large number of black [pycnidia](#).



Symptoms

The stem portion can be easily pulled out leaving the rotten root portion in the soil. The infection when spreads to pods, they open prematurely and immature seeds shriveled and become black in colour. Minute pycnidia are also seen on the infected capsules and seeds. The rotten root as well as stem tissues contains a large number of minute black [sclerotia](#). The sclerotia may also be present on the infected pods and seeds.

### Pathogen

The pathogen produces dark brown, septate mycelium showing constrictions at the hyphal junctions. The [sclerotia](#) are minute, dark black and 110-130µm in diameter. The [pycnidia](#) are dark brown with a prominent [ostiole](#). The [conidia](#) are hyaline, elliptical and single celled.

### Favourable Conditions

- Day temperature of 30°C and above
- Prolonged drought followed by copious irrigation.

### Disease cycle

The fungus remains dormant as sclerotia in soil as well as in infected plant debris

in soil. The infected plant debris also carries pycnidia. The fungus primarily spreads through infected seeds which carry sclerotia and pycnidia. The fungus also spreads through soil-borne sclerotia. The secondary spread is through the conidia transmitted by wind and rain water.

### Management

- Seed treatment with carbendazim + thiram (1:1) at 2g/kg seed.
- Treat the seeds with [Trichoderma viride](#) at 4g/kg.
- Apply farm yard manure or green leaf manure at 10t/ha or neem cake 150 kg/ha. Spot drench with Carbendazim at 1.0 g/litre.

### Leaf blight - [Alternaria sesami](#)

#### Symptoms

Initially small, circular, reddish brown spots (1-8mm) appear on leaves which enlarge later and cover large area with concentric rings. The lower surface of the spots are greyish brown in colour. In severe blighting defoliation occurs. Dark brown lesions can also be seen on petioles, stem and capsules. Infection of capsules results in premature splitting with shriveled seeds.

#### Pathogen

The mycelium of the fungus is dull brown and septate and produce large number of pale grey-yellow [conidiophores](#) which are straight or curved. The conidia are light olive coloured with transverse and longitudinal septa. These are around 3-5 septate and conidia are borne in chain over short conidiophore.

#### Favourable Conditions

- Low temperature (20-25°C),
- High relative humidity
- Cloudy weather.

#### Disease Cycle

The fungus is seed-borne and also soil-borne as it remains dormant in the infected plant debris.

#### Management

- Treat the seeds with thiram or Carbendazim at 2g/kg.
- Spray Mancozeb at 2kg/ha or [Iprodion](#) 1L/ha.

## **Leaf spot - *Cercospora sesami***

### **Symptoms**

The disease first appears on the leaves as minute water-soaked lesions, which enlarge to form round to irregular spots of 5-15 mm diameter on both the leaf surface. The spots coalesce to form irregular patches of varying size leading to premature defoliation. The infection is also seen on stem and petiole forming spots of varying lengths. Dark linear spots also occur on pods causing drying shedding.



**Symptoms**

### **Pathogen**

The hypha of the fungus is irregularly septate, light brown and thick walled. Conidiophores are produced in cluster and are 1-3 septate, hyaline at the tip and light brown coloured at base. Conidia are elongated, 7-10 septate, hyaline to light yellow, broad at the base and tapering towards the apex.

### **Disease Cycle**

The fungus is externally and internally seed-borne. The fungus also survives in plant debris. Primary infection may be from the seeds and infected debris. The secondary spread is through wind-borne conidia.

### **Management**

- Treat the seeds with Carbendazin or Thiram at 2g/kg.
- Spray with Mancozeb at 2kg/ha.

## **Wilt - *Fusarium oxysporum* f.sp. *sesami***

## Symptoms

The disease appears as yellowing, drooping and withering of leaves. The plants gradually wither, show wilting symptoms leading to drying. The infected portions of root and stem show long, dark black streaks of vascular necrosis.



Symptoms

## Pathogen

The fungus produces [macroconidia](#), [microconidia](#) and [chlamydospores](#). Macroconidia are falcate shape, hyaline and 5-9 celled. Microconidia are hyaline, thin walled, unicellular and ovoid. The dark walled chlamydospores are also produced.

## Disease Cycle

The fungus survives in the soil in the infected plant debris. It is also seed-borne and primary infection occurs through infected seeds or through chlamydospores in soil. The secondary infection may be caused by conidia disseminated by rain splash and irrigation water.

## Management

- Treat the seeds with Thiram or Carbendazim at 2g/kg
- Seed treatment with [Trichoderma viride](#) at 4g/kg.
- Apply heavy doses of green leaf manure or farm yard manure.

**Stem blight - *Phytophthora parasitica* var. *sesami***

## Symptoms

Black coloured lesions appear on the stem near the soil level. The disease spreads further and affects branches and may girdle the stem, resulting in the death of the plant. Leaves may also show water-soaked patches and spread till the leaves wither. Infection may be seen on flowers and capsules. Infected capsules are poorly developed with shriveled seeds.



Symptoms

## Pathogen

The fungus produces non-septate, hyaline mycelium. The [sporangiophores](#) are hyaline and branched sympodially and bear [sporangia](#). The sporangia are hyaline and spherical with a prominent apical papilla. The oospores are smooth, spherical and thick walled.

## Favourable Conditions

- Prolonged rainfall,
- Low temperature (25°C)
- High relative humidity (above 90 per cent)

## Disease Cycle

The fungus can survive in the soil through dormant mycelium and [oospores](#). The seeds also carry the fungus as dormant mycelium, which causes the primary infection. Secondary spread of the disease is through wind-borne [sporangia](#).

## Management

- Treat the seeds with captan or thiram at 2g/kg or metalaxyl @ 4g/kg.
- Avoid continuous cropping of sesamum in the same field.
- Remove and destroy infected plant debris.

- Spray metalaxyl 1kg/ha.

### **Powdery mildew - [Erysiphe cichoracearum](#) (Syn: *Oidium acanthospermi*)**

#### **Symptoms**

Initially greyish-white powdery growth appears on the upper surface of leaves. When several spots coalesce, the entire leaf surface may be covered with powdery coating. In severe cases, the infection may be seen on the flowers and young capsules, leading to premature shedding. The severely affected leaves may be twisted and malformed. In the advanced stages of infection, the mycelial growth changes to dark or black because of development of [cleistothecia](#).



**Symptoms**

#### **Pathogen**

The Pathogen produces hyaline, septate mycelium which is extrophytic and sends [haustoria](#) into the host epidermis. [Conidiophores](#) arise from the primary mycelium and are short and non septate bearing conidia in long chains. The conidia are ellipsoid or barrel-shaped, single celled and hyaline. The [cleistothecia](#) are dark, globose with the hyaline or pale brown myceloid appendages. The [asci](#) are ovate and each ascus produces 2-3 ascospores, which are thin walled, elliptical and pale brown in colour.

#### **Favourable Conditions**

- Dry humid weather.
- Low relative humidity.

#### **Disease Cycle**

The Pathogen is an [obligate parasite](#) and disease perennates through cleistothecia in the infected plant debris in soil. The [ascospores](#) from the cleistothecia cause primary infection. The secondary spread is through wind-borne conidia.

### Management

- Remove the infected plant debris and destroy.
- Spray wettable sulphur at 2.5 kg/ha or karathane 1L/ha repeat after 15 days.

### Bacterial leaf spot - [Xanthomonas campestris pv. sesami](#)

#### Symptoms

Initially water-soaked spots appear on the undersurface of the leaf and then on the upper surface. They increase in size, become angular and restricted by veins and dark brown in color. Several spots coalesce together forming irregular brown patches and cause drying of leaves. The reddish brown lesions may also occur on petioles and stem.



Symptoms

#### Pathogen

The bacterium is a [Gram negative](#) rod with a [monotrichous](#) flagellum.

#### Disease cycle

The bacterium survives in the infected plant debris and in seeds. The secondary spread is by rain water.

#### Management

- Remove and burn infected plant debris.



- Spray [Streptomycin sulphate](#) or [oxytetracycline hydrochloride](#) or [streptocyclin](#) at 100g/ha.

### **Bacterial leaf spot - [Pseudomonas sesami](#)**

#### **Symptoms**

The disease appears as water-soaked yellow specks on the upper surface of the leaves. They enlarge and become angular as restricted by veins and veinlets. The colour of spot may be dark brown with shiny oozes of bacterial masses.



**Symptoms**

#### **Pathogen**

The bacterium is gram negative aerobic rod with one or more polar flagella.

#### **Disease cycle**

The bacterium remains viable in the infected plant tissues. It is internally seedborne and secondary spread through rain splash and storms.

#### **Management**

- Keep the field free of infected plant debris.
- Spray with Streptomycin sulphate or oxytetracycline hydrochloride or streptocyclin at 100g/ha.

### **Phyllody - [Phytoplasma](#)**

#### **Symptoms**

The symptoms starts with vein clearing of leaves .The disease manifests itself mostly during flowering stage, when the floral parts are transformed into green leafy structures, which



grow profusely. The flower is rendered sterile. The veins of [phyllloid](#) structure are thick and prominent. The plant is stunted with reduced internodes and abnormal branching.



**Symptoms**

### **Pathogen**

It is caused by [pleomorphic mycoplasma](#) like bodies present in sieve tube of affected plants, now designated as a phytoplasma disease.

### **Disease cycle**

The pathogen has a wide host range and survives on alternate hosts like [Brassica campestris var. toria](#), [B. rapa](#), [Cicer arietinum](#), [Crotalaria sp.](#), [Trifolium sp.](#), [Arachis hypogaea](#) which serve as source of inoculum. The disease is transmitted by jassid, [Orosius albicinctus](#). Optimum acquisition period of vector is 3-4 days and inoculation feeding period is 30 minutes. The [incubation period](#) of the pathogen in leaf hoppers may be 15-63 days and 13-61 days in sesame. Nymphs are incapable of transmitting the phytoplasma. Vector population is more during summer and less during winter months.

### **Management**

- Remove all the reservoir and weed hosts.
- Avoid growing sesamum near cotton, groundnut and grain legumes.
- Rogue out the infected plants periodically.
- Spray Monocrotophos or Dimethoate at 500ml/ha to control the jassids

- Soil treatment with Thirnet 10G @ 10 kg/ha or [Phorate](#) 10 G @ 11 kg/ha at the time of sowing.

### **Minor disease**

#### **Anthracnose - [Colletotrichum sp.](#)**

Dark brown lesions on leaf stem and capsules with black [acervuli](#) in the central portion.