Diseases of Oil Seed

Name of diseases	Causal organisms
A. Mustard	
i) Grey spot/Alternaria leaf spot or blight	*i) Alternria brassicae, A. brassicicola*
ii) Black spot	*ii) A. brassicicola*
iii) Downy mildew	*iii) Pseudoperonospora brassicae*
iv) Powdery mildew	*iv) Erysiphe brassicae*
v) Leptosphaerulina blight	*v) Leptosphaerulina brassicae*
vi) Black rot	*vi) Xanthomonas campestris*
vii) Broome rape	*vii) Orobanche aegiptiaca*
viii) Mosaic	*viii) Mustard mosaic virus*
ix) White rust	*ix) Albugo candida*
B. Groundnut	
i) Leaf spot /Tikka disease	*i) Cercospora arachidicola, Cercosporidium personatum*
ii) Leaf rust	*ii) Puccinia arachidis*
iii) Foot and root rot/Collar rot/stem rot	*iii) Sclerotium rolfsii*
iv) Charcoal rot/black rot	*iv) Macrophomina phaseolina*
v) Yellow mosaic	v) *Yellow mosaic virus*
vi) Seed rot germination failure	vi) *Aspergillus flavus*
C. Soybean	
i) Frog-eye leaf spot	*i) Cercospora sojina*
ii) Anthracnose	*ii) Colletotrichum dematium* f. sp. *truncata*
iii) Wilting	iii) *Fusarium oxysporum*
iv) Foot and root rot	*iv) Fusarium oxysporum, Sclerotium rolfsii*
v) Pod and stem blight	*v) Phomopsis sojae*
vi) Leaf rust	*vi) Phakopsora pachyrhizi*
vii) Bacterial pustule	*vii) Xanthomonas phaseoli* pv. *sojense*
viii) Leaf curl	*viii) Leaf curl virus*
ix) Soybean yellow mosaic	*ix) Soybean yellow mosaic virus*
x) Charcoal rot	x) *Macrophomina phaseolina*
D. Sesame (Til)	
Stem rot	*Macrophomina phaseolina*
E. Niger (Garzan Til)	
Leaf blight	*Alternaria* spp.
F. Linseed /flax (Moishna)	
i) Alternaria leaf blight	i) *Alternaria* spp.
ii) Wilt	*ii) Fusarium oxysporum*
iii) Rust	iii) *Melampsora lini*
G. Safflower	
Leaf blight	*Alternaria* spp.
H. Sunflower	
i) Alteranari blight	*i) Alternaria helianthi*
ii) Foot rot/wilt	*ii) Sclerotium rolfsii*

1. Disease name: Alternaria leaf spot or blight of mustard
Causal organism: *Alternria brassicae, A. brassicicola*

Symptom

- All the green parts of the plants are attacked.
- In early stage, disease appear as small dark brown to grey dot like spot on leaf, which expand rapidly to form circular lesions. Spots usually occur on older leaves.
- The mature spots are characterized by concentric ring with purple or black border
- Later on, several spots coalesce and ultimately the leaves become blighted.
- The spots on stem, pods and petioles are more or less round with dark brown to black dot like and the infected seeds are shriveled.

Favorable condition

- Cool temperature: <20º c
- High humidity i.e. moist weather RH >80%
- Foggy weather

Disease cycle

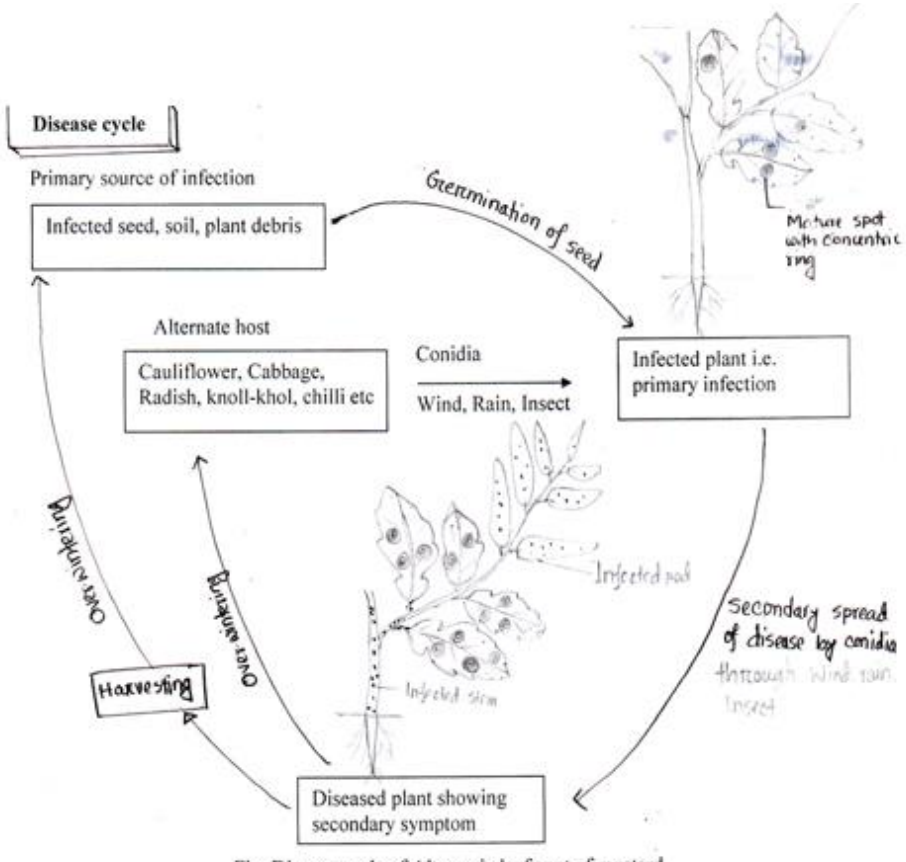


Fig. Disease cycle of Alternaria leaf spot of mustard

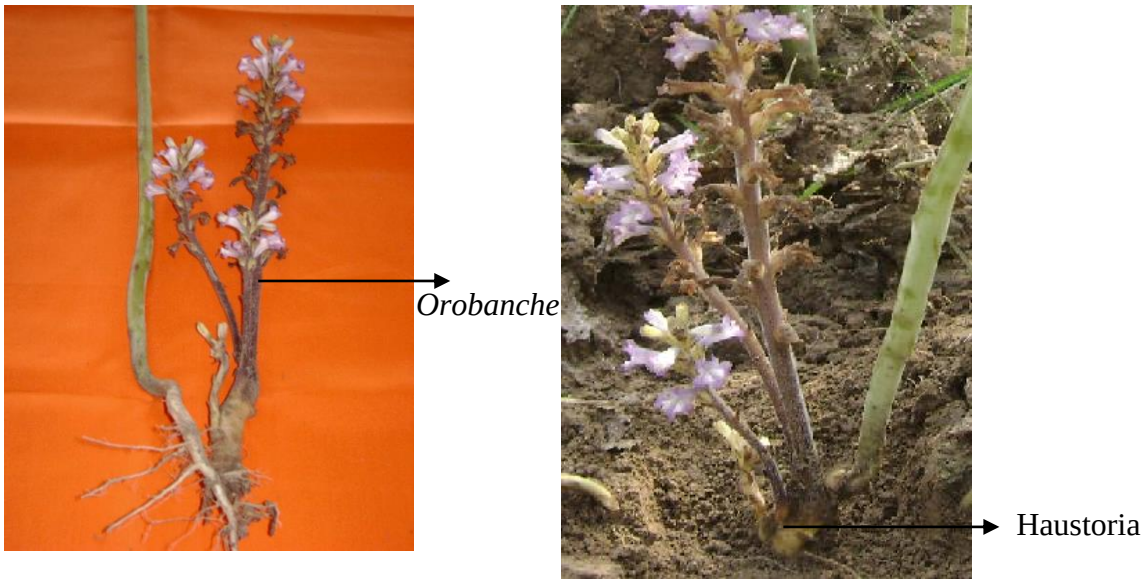
Control measures

i) Destruction of crop residues by burning
ii) Crop rotation followed by non host crops
iii) Collection of seeds from healthy plants growing in disease free area
iv) Use of resistant variety like BINA-1, BINA-3, sampad, BARI sharisha 11
v) Combination of sowing date (early sowing) and variety
vi) Seed treatment with captan or provax-200 @ 0.2% of seed wt. i.e. 2g/kg of seed
vii) Spraying with Rovral/ Ridomil MZ@ 0.2% at 2 installments.
-One spray when the plants are 35-40 days and other 50-55 days after sowing

2. Disease name: Broom rape
Causal agent: *Orobanche aegyptiaca*

Symptoms

- Violet color parasitic plants are appear along with the stem at ground level.
- *Orobanche* attached mustard root with haustoria, as a result growth of the plant is reduced.
- The infected plant produces less number of flowers & fruits.
- In severe infection, the host become dead.



Control

1. Deep ploughing and opening the land to the sun
2. Before flowering of *Orobanche*, it should be removed
3. Crop rotation with cereals crops
4. Use resistant or tolerant variety like BARI sarisha-11
5. Spraying the soil with 25% CuSO4 solution for effective treatment.

3. Disease name: Leaf spot /Tikka disease of Groundnut
Causal organis: *Cercospora arachidicola, Cercosporidium personatum*

This is the most destructive disease of groundnut and very common in all parts of Bangladesh and other countries.

Symptoms
The Tikka disease appear as two distinct types of leaf spots: **a)** Early leaf spot **b)** Late leaf spot

a. Early leaf spot
Early spot is caused by *C. arachidicola.* The early spots first appear when the plants are 1-2 months old. Spots first appear on the upper surface and are characterized by a brown-red, irregularly circular spot with yellow halo. Spores are formed mostly on the upper surface of leaf. Haloes are indistinct on the lower leaf surface.

Early leaf spot

Late leaf spot

b. Late leaf spot
Late leaf spot caused by *C. personata*. Late leaf spots appear generally on both sides of the leaf during the later part of the growing season. The spots are more circular and darker brown to black than early leaf spot and commonly show no yellow halo (halo may appear only as the spot matures). They may also be found on leaves, stipules, petioles and stems. Spores are formed mostly on the lower surface of leaf.

Disease cycle
The pathogens overwinter primarily in the plant debris and seed. The spores are disseminated by wind fall on leaves, germinate and infect the host tissue. Spots develop within a week's time and the spores produced on the spots help in secondary spread of the disease through insect, rainflash, wind.

Factors influencing disease development
- Prolonged high relative humidity (> 95%),
- Close planting and fairly high temperature (> 25ºC),
- Deficiency of magnesium in soil
- Excess nitrogen and phosphoric fertilizer favour sporulation, infection and disease development.

Control

i) The crop residues should be collected and burnt after harvesting the pods
ii) The disease can be effectively controlled by spraying Tilt (0.2%) or Bavistin 50 WP (0.2%) 2-3 times at 10 days intervals, beginning 4-6 weeks after sowing.
iii) Cultural practices such as proper fertilization and weed control reduce the disease severity
iv) Use disease resistant variety. eg. Basanti badam (DG-2), BARI Chinabadam 7, 8

4. Disease name: Stem rot/Foot and root rot of groundnut
Causal organism: *Sclerotium rolfsii*

Symptoms

The first symptom is the sudden drying of a branch which is completely or partially in contact with the soil. The leaves turn brown and dry but remain attached to the plant. Near soil line/collar region on stems white growth of fungus mycelium is appeared. As the disease advances white mycelium web spreads over the soil and the basal canopy of the plant. The sclerotia size and colour of mustard seeds, appear on the infected areas as the disease develops and spreads. The entire plant may be killed or only two or three branches may be affected. Lesions on the developing pegs can retard pod development. Infected pods are usually rotted.

Favourable Conditions

- Warm (about 32º C) wet weather
- Prolonged rainy season at seedling stage and low lying areas
- High organic matter

Disease cycle

The fungus remains dormant as sclerotia for a long period in the soil and in infected plant debris. The primary infection is through soil-borne and seed-borne sclerotia. Sclerotia germinate grow rapidly through a limited area of soil and infect plant. The secondary spread of sclerotia is aided by irrigation water, human agency, infected seeds, implements and cattle etc.

Control

The causal organism is soil-borne and there is no effective control for this disease

- Plow crop debris deeply into soil after harvesting
- Good drainage in the field should be maintained.
- Crop rotation with wheat, corn and soybean may minimize the incidence of stem rot.
- Applications of appropriate fungicides can help suppress stem rot but care should be taken with selection as some pesticides (e.g. benomyl) are known to increase the severity of the disease
- Pre sowing seed treatment with Provax 200 @ 0.2% (2 g/kg of seed) or Agarsan or *Trichoderma* spp (4 g/kg of seed) can reduce the disease infestation
- Spot drench with Carbendazim at 0.5 g/lit or Bavistin (0.1%).

5. Disease name: Rust of groundnut

Causal organism: *Puccinia arachidis*

Symptoms

Characteristic orange pustules (uredosori) appear on the lower surface of leaves which become covered in masses of red-brown spores. Corresponding to the sori, small, necrotic, brown spots appear on the upper surface of leaves. The rust pustules may form on pods. In severe infection lower leaves dry and drop prematurely. The severe infection leads to production of small and shriveled seeds.

Favourable Conditions

- High relative humidity (> 85%).
- Heavy rainfall.
- Low temperature (20-25˚C).

Disease cycle

The pathogen survives as uredospores on volunteer groundnut plants. The fungus also survives in infected plant debris in soil. The spread is mainly through wind borne inoculum of uredospores. The uredospores also spread as contamination of seeds and pods. Rain splash and implements also help in dissemination. The fungus also survives on the collateral hosts like *Arachis marginata, A. nambyquarae* and *A. prostrate.*

Management

- Avoid mono culturing of groundnut.
- Remove volunteer groundnut plants and reservoir hosts.
- Spray mancozeb 2 kg or Wettable Sulphur 3 kg or or Chlorothalonil 2 kg/ha.
- Grow moderately resistant varieties

6. Disease name: Frog-eye leaf spot of soybean

Causal organism: *Cercospora sojina*

Symptoms

Lesions on leaves are circular to angular spots which vary in size from less than 1 mm to 5 mm in diameter. The lesions are distinctive in that the brown spots are surrounded by a narrow red or dark reddish-brown margin. Older lesions are light to dark brown and frequently are translucent, having a grey to white center which may contain minute dark spots. Smaller lesions may coalesce to form larger, irregular spots on leaves. When plants are heavily infected, leaves may die and fall prematurely. If high rainfall and humidity persist, stems and seeds also may become infected. Older lesions on pods become brown to gray, usually with a narrow, dark-brown border.

Favourable conditions

- Fungus survives in infected seeds and in debris.
- Warm, humid conditions with heavy dews (77-86ºF; >90% RH) favor disease incidence

Management

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

7. Disease name: Anthracnose of soybean

Causal organism: *Colletotrichum dematium* f.sp. *truncata*

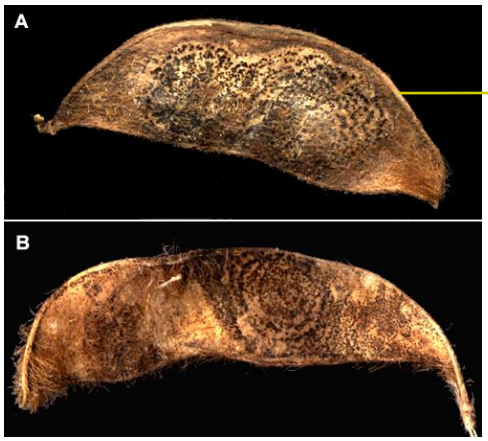
Symtpoms

i) Elongated (2´´ or more) reddish brown lesions develop on leaf petioles.

ii) Symptoms on stem and pod include blotchy areas of discoloration which are usually grey but may be reddish brown.

iii) Often on stem small black cushion-like structures of acervuli are formed instead of blotchy discoloration.

iv) Dark brown cankerous lesions appear on the cotyledons.



acervuli

Management

i) Destruction of crop residues by burning
ii) Collection of healthy seeds from disease free area
iii) Practicing crop rotation with grass crops
iv) Cultivation of resistant variety
v) Seed treatment with provax-200 @ 0.2-0.3% of seed weight
vi) Spraying Bavistin@ 0.2%.

8. Disease name: Yellow mosaic of soybean

Causal agent: *Soybean mosaic virus* (SMV)

Symptoms

i) Bright or golden yellow areas along with dark or light green patches scattered all over the leaf surface
ii) The yellow mooted leaves become dwarf and smaller in size.
iii) Pods become fewer and smaller seeds.
iv) Infected seeds get mottled and deformed.

Favorable conditions

- Temperature around 18° C
- Humid weather.

Management

- Use tolerant variety. e.g. Bangladesh soybean-4 (G-2) and PB-1 (shohag)
- Rouge out and buried the diseased plants from the field immediately after appearance of the diseases
- Use of healthy and disease free seeds.
- Keep the field free from weeds.
- Control of aphids by two foliar spraying Malathion 57EC / Diazinon 60 EC @ 2ml/L at 30 and 45 days after sowing.

9. Disease name: Stem rot of sesame

Causal organism: *Macrophomina phaseolina*

Symptoms:

- Symptoms of the infected plant shows brown elongated lesions of irregular shape on the stem and bark at the collar region shows shredding.
- The lesion elongated and cover the whole length of the stem and produce numerous black pycnidia on the stem
- Severely infected plants become defoliated.

Favourable Conditions

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

Management

- Destruction or burning the plant debris from the field just after harvesting
- Seed should be treated with fungicides like Homai @ 0.25 % of dry weight or with carbendazim + thiram (1:1) at 2g/kg seed and 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
- Spraying the foliage with Copper oxychloride @ 3 kg/ha

10. Disease name: Alternaria leaf blight of sunflower

Causal organism: *Alternaria helianthi*

Symptoms

i) Brown spots appear mostly on the leaves but may also appear on the stem, sepals and petals
ii) The spots are circular or roundish with concentric ring
iii) Lesions on the leaves are dark brown with pale margin and yellow halo.
iv) Several spots coalesce together and form a bigger irregular lesion leading to drying and defoliation.


Management

- Deep summer ploughing.
- Maintaining wide spacing during sowing
- Early sowing of seeds (mid-September)
- Clean cultivation and field sanitation.
- Use of resistant or tolerant variety
- Practicing crop rotation with other crops except cruciferous plant
- Remove and destroy the diseased plants
- Treat the seeds with Thiram or Carbendazim at 2 g/kg.
- Spraying Rovral @ 0.1% after 30, 40 and 50 days of sowing

11. Disease name: Rust of linseed

Causal organism: *Melampsora lini*

Symptoms

i) Bright to orange colored uredosroi on the leaves, stems and capsules are presence
ii) Uredia occur in large numbers on both surfaces of the leaves and other aerial parts of the plant
iii) As the disease advances the sori turn black with the formation of telial stage
iv) The telia appear as crust and remain covered by epidermis.
v) Both the pycnidia and aeicial stages are found on the same host, mostly on the leaves.
vi) Aecia are orange coloured and formed on the under surface of the leaf.

Management

- Avoid mono culturing of groundnut.
- Remove volunteer groundnut plants and reservoir hosts.
- Spray mancozeb 2 kg or Wettable Sulphur 3 kg or or Chlorothalonil 2 kg/ha.
- Grow moderately resistant varieties.