

Diseases of Groundnut

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Diseases of Groundnut

Tikka disease

- ▣ Early Leaf spot : *Cercospora arachidicola*
- ▣ Late leaf spot : *Cercospora personata*

Rust disease : *Puccinia arachidis*

Collar rot disease : *Aspergillus niger*

Root rot disease : *Macrophomina phaseolina*

Stem rot disease : *Sclerotium rolfsii*

Ring mosaic / Bud necrosis / Bud blight – TSWV

Groundnut rosette disease

Tikka leaf spots

Early leaf spot - *Cercospora arachidicola* = *Mycosphaerella arachidis*

Late leaf spot - *Cercospora personata* = *Mycosphaerella berkeleyi*



Early leaf spot

Cercospora arachidicola



Cercospora arachidicola



Symptoms

- Infection starts about 1 month after sowing
- Small dark spots appear on the leaf then enlarge to 3 to 8 diameter
- Circular to irregular surrounded by yellow halo
- Lesions enlarge and coalesce to form irregular blighted patches
- Infected leaves may drop off prematurely



Photo by Barbara Shew, North Carolina State University, Bugwood.org

Late leaf spot - *Phaeoisariopsis personata*



Symptoms

- Infection starts around 46 -55 days after sowing
- Black & nearly circular spots appear on the lower surface of the leaflets.
- Many lesions coalesce resulting in premature senescence and shedding of the leaflets.

Early leaf spot

Late leaf spot

Infection starts about a month after sowing.

Infection starts around 5 – 7 week after sowing

Circular or irregular reddish brown lesion with yellow halo

Small circular dark brown lesion without yellow halo

On lower surface lesion light brown colour.

Lower surface lesion carbon black colour

Conidia whip like pale yellow 3-12 septum

Conidia obclavate 4-12 septa

Both produces lesions also appear on petioles, stems, pegs. The lesion coalesce and premature dropping of leaves . The quality and yield reduced

Mode of spread

- Survives in the infected plant debris and seed
- PI : Ascospore
- SI : Air borne conidia

Favourable Conditions

- High relative humidity, low temperature with dew on leaf surface
- Heavy doses of nitrogen and phosphorus fertilizers and deficiency of magnesium in soil

Management

- Seed treatment with Carbendazim or Thiram at 2g/kg
- Spray Carbendazim 250g or Mancozeb 1 kg or Chlorothalonil 1 kg/ha
- Moderately resistant varieties -ALR1

Rust- *Puccinia arachidis*

Symptoms : brown rust pustules appear on the lower surface of the leaves . Severe infection leads premature defoliation. Only uredial and telial stages have been reported

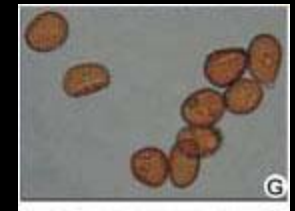


Favourable condition

- High RH, heavy rainfall & low temp (20-25°C)
- Mode of spread : mainly through uredospore

Management

- Spray application of Tridemorph or Chlorothalonil 2gm/lit



Uredopores



Teliospore



Collar rot /seedling blight / crown rot- *Aspergillus niger* & *A. pulverulentus*

Symptoms

Pre-emergence rot : Seeds are infected by soil borne conidia and prevents germination . Seeds are covered by black mass of conidia.

Post emergence rot : Young seedling circular brown spot appear on the cotyledon, spreads to hyphocotyl and stem. The affected portion become soft and resulting in collapse of the seedlings. Collar region covered with profuse growth of the fungus.

Crown rot:

Lesion develops on the stem below the soil level and spreads upward along the branches causing drooping of leaves and wilting of plants

Pathogen

- Hyaline mycelium, Vesicle, sterigmata, conidia black colour











Mode of spread :

PI : Through seeds

Survives in infected plant debris, Soil borne conidia infects the seed

Favourable condition

- Prolonged rainy season
- Deep sowing of seeds.
- High soil temperature (30-35° C).

Management

- Use of good quality seeds
- Removal and destruction of crop debris
- Seed treatment with Captan @ 3g/kg seed or Thiram @ 3-5 g/kg seed or Carbendazim 2 g/kg seed

Management

- Avoiding Deep sowing of seed as etiolated hypocotyls are prone to infection.
- Avoiding mechanical damage, destroying plant debris, deep ploughing and rotation of groundnut with gram and wheat is useful in reducing the collar rot disease incidence.
- Seed treatment with *Trichoderma viride*/ *T. harizanum* @ 4g/kg seed and soil application of *Trichoderma* @2.5kg/ha preferably in combination with organic amendments such as castor cake or neem cake or mustard cake @ 500kg/ha.
- Treat the seeds before sowing with Thiram 75% WP @5g/kg seed or Captan 80% WP 3g/kg seed or Mancozeb 75% @ 3g/kg or Carbendazim 50% WP @ 2g/kg of kernels control the seed borne infections.
- Spray Mancozeb 3gm/lit or Carbendazim 1 g/litof water immediately when disease is noticed.

Root rot- *Macrophomina phaseolina*

Symptoms

- Reddish brown lesion above soil level
- Leaves and branches droop – death of plants
- Shredding of bark
- Black sclerotia in infected tissues
- Blackening of shells sclerotia found inside

Favourable condition

- Prolonged dry season
- Mode of spread
- PI : Soil and seed borne sclerotia
- SI : Spreads through irrigation water, implements

Management

- Use of *Trichoderma* and *Pseudomonas*
- Seed treatment- Carbendazim at 3 g/kg
- Spot drench- carbendazim@0.5g/lit



Sclerotium Stem Rot- *Sclerotium rolfsii*

Symptoms

- **Browning and wilting of leaves and branches which are still attached with the plant. The fungus preferentially infects stem by forming a whitish mycelia mat around the stem**
- **It also infect any part of the plant including root, leaf and pod. In heavy soils, fungus damages groundnut plants near the soil surface but in light soils it can reach upto pod level, causing severe damage to pegs and pods**
- **.Infected pods are covered by mycelia usually rot. When bark is peeled off, the inner tissue shows a brown to yellow discoloration**
- **. Drying or shrivelling of the affected branches ultimately lead to death of the complete plants after wilting.**

Mode of spread:

- The pathogen survives as a saprophyte on plant debris, even debris from non-host crops.
- Sclerotia survive well (3-4 years) at or near the soil surface but survive poorly when buried deep because the fungus has a high oxygen demand (Mehan *et al.* 1994).
- Infection starts from sclerotia that germinate in the presence of volatile compounds from decaying organic matter under warm and moist conditions.

Favourable condition

Warm and moist climatic conditions favour disease development





Management

- **Deep ploughing to bury surface litter,**
- **Rotation of groundnut with non susceptible crops such as corn, cotton, and wheat can greatly reduce stem rot incidence and severity**
- **Seed treatment with *Trichoderma viride* @ 4 g/kg seed and soil application of *Trichoderma viride* @2.5 kg/ha, mixed with 50 kg FYM or in conjunction with organic amendments such as castor cake or neem cake or mustard cake @ 500 kg/ ha.**
- **Seed treatment with 3 g Thiram + Carbendazim is recommended.**
- ***Trichoderma harzianum, T. viride, T. longibrachiatum*) bacteria *Pseudomonas fluorescens, Bacillus subtilis*(Highly antagonistic**

Rhizoctonia Damping-Off

Symptoms

Seedlings show sunken, elongate, dark brown areas just below the soil surface (Fig.). The lesions enlarge, become black, and girdle the hypocotyls (Fig.). Similar lesions develop on tap roots, and extend to the entire root system leading to dry root rot. Subsequently the plants are killed.



Web Blotch

Symptoms

Scattered tan colored specks or streaks appear on the upper surfaces of the lower leaves.

The discolored areas expand, forming large, nearly circular, purplish brown to dark brown blotches with inconspicuous margins (Fig.).

Blotches often coalesce and cover the entire leaflet.



Phyllosticta Leaf Spot

Symptoms

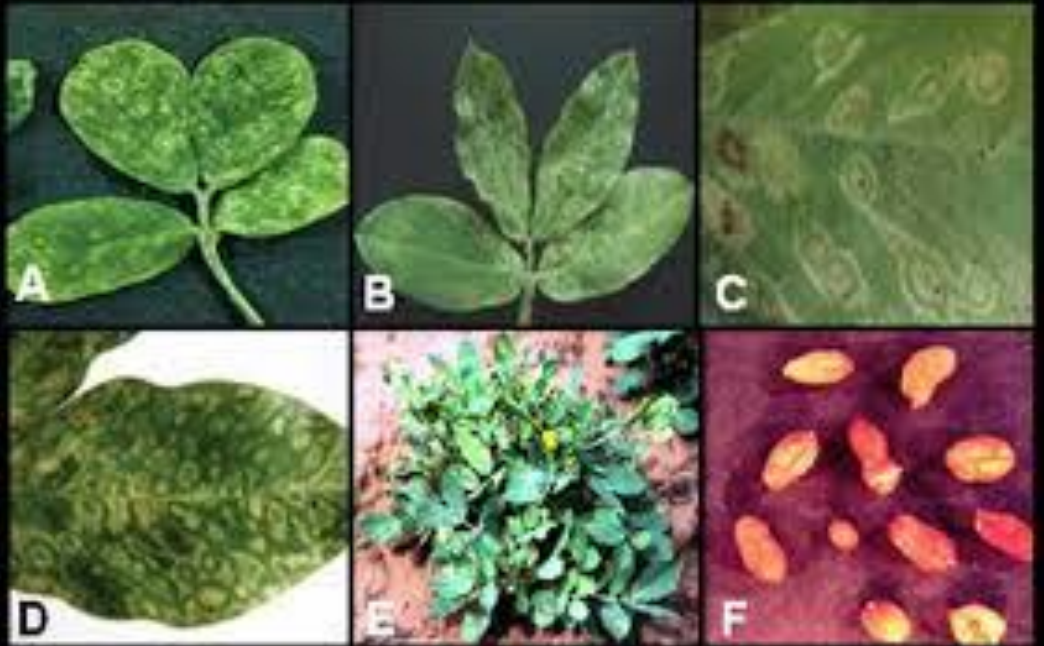
Infection starts in damaged and dead tissue and subsequently spreads into the living green areas of the leaflets. Lesions are circular to irregular and are light tan in color surrounded by a reddish-brown border



**Bud necrosis/Bud rot/Bud blight : *Peanut bud necrosis virus*
*Thrips tabaci, Frankiliniella sp***

Symptoms

- **Chlorotic spots appear on young leaflets and necrotic rings and streaks are developed.**
- **Terminal bud necrosis occurs when temperature is relatively high.**
- **As the plant matures it becomes stunted with short internodes and proliferation of auxiliary shoots.**
- **Drastic reduction in flowering is noticed and seeds are produced are abnormally small and wrinkled with the dark black lesions**



Management

- Tolerant variety ICGS 11, ICGS 44 and R 8808
- Adopt a close spacing of 15 × 15 cm
- Remove infected plants up to 6 weeks after sowing
- Dimethoate 2 ml/ lit or alone or in combination with antiviral principles. Antiviral principles from sorghum or coconut leaves.
- Imidachloprid 0.33 ml/ lit or neem oil 3ml/lit
- Intercrop- groundnut : pearl millet in 7:1 ratio

Groundnut rosette - *Groundnut rosette virus*

- Younger leaflets first show faint mottling and all subsequent leaflets are pale yellow with green veins.
- Plants infected when young, produce progressively smaller, chlorotic, twisted and distorted leaflets, but when infected at a later stage, they show symptoms in only a few branches or the apical portion of the plant.
- Internodes are shortened and stems thickened, especially in plants infected when young. Affected plants, especially those infected young, are severely stunted

Management

Removal of and volunteer plants,
Spraying of Methyl demeton 500 ml/ ha



Vector : Aphis craccivora





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Peanut mottle (*Peanut mottle virus*) of groundnut



Peanut mottle (*Peanut mottle virus*) of groundnut



Minor diseases

Stem rot

Corticium rolfsii

Wilt

Fusarium oxysporum

Anthracnose

*Colletotrichum
dematium*

Grey mould

Botrytis cinerea

Yellow mould

Aspergillus flavus

Bacterial wilt

P.solanacearum

Thank you !

