

DISEASE OF COTTON

MAJOR DISEASES

S. No.	Name of Disease	Scientific Name
1.	Wilt	Fusarium oxysporum
2.	Verticillium wilt	Verticillium dahliae
3.	Root rot	Rhizoctonia solani
4.	Anthraxnose	Colletotrichum capsici
5.	Grey or Areolate mildew	Ramularia areola
6.	Leaf blight	Alternaria macrospora
7.	Bacterial blight	Xanthomo asaxonopodis pv. Malvacearum
8.	Leaf curl Disease	Cotton Leaf curl virus
9.	Stenosis or Small leaf -	Phytoplasma

1. Wilt - *Fusarium oxysporum*



Symptoms

- The earliest symptoms appear on the seedlings in the cotyledons which turn yellow and then brown. The base of petiole shows brown ring, followed by wilting and drying of the seedlings.
- In young and grown up plants, the first symptom is yellowing of edges of leaves and area around the veins i.e. discoloration starts from the margin and spreads towards the midrib.

- The leaves lose their turgidity, gradually turn brown, droop and finally drop off.

Favorable Conditions

- Soil temperature of 20-30°C
- Hot and dry periods followed by rains
- Heavy black soils with an alkaline reaction
- Increased doses of nitrogen and phosphatic fertilizers

Management

- Treat the acid delinted seeds with Carboxin or Carbendazim at 2 g/kg.
- Remove and burn the infected plant debris in the soil after deep summer ploughing during June-July.
- Apply increased doses of potash with a balanced dose of nitrogenous and phosphatic fertilizers.

2. Verticillium wilt - *Verticillium dahliae***Symptoms**

- Plants infected at early stages are severely stunted.
- The first symptoms can be seen as bronzing of veins. It is followed by interveinal chlorosis and yellowing of leaves.
- Finally the leaves begin to dry, giving a scorched appearance. At this stage, the characteristic diagnostic feature is the drying of the leaf margins and areas between veins, which gives a "Tiger stripe" or "Tiger claw" appearance.

**Favorable Conditions**

- Low temperature of 15-20°C,
- Low lying and ill-drained soils,
- Heavy soils with alkaline reaction
- Heavy doses of nitrogenous fertilizers.

Management

- Treat the delinted seeds with Carboxin or Carbendazim at 2 g/kg.
- Grow disease resistant varieties like Sujatha, Suvin and CBS 156 and tolerant variety like MCU 5 WT.

3. Root rot - *Rhizoctonia solani*



Symptoms

- The pathogen causes three types of symptoms viz., seedling disease, sore-shin and root rot.
- Germinating seedlings and seedlings of one to two weeks old are attacked by the fungus at the hypocotyl and cause black lesions, girdling of stem and death of the seedling, causing large gaps in the field.
- In sore-shin stage (4 to 6 weeks old plants), dark reddish-brown cankers are formed on the stems near the soil surface, later turning dark black and plant breaks at the collar region leading to drying of the leaves and subsequently the entire plant.
- Typical root rot symptom appears normally at the time of maturity of the plants.

Favorable conditions

- Dry weather following heavy rains,
- High soil temperature (35-39°C).

Management

- Treat the seeds with *Trichoderma viride* @ 4g/kg of seed.
- Apply farm yard manure at 10t/ha or neem cake at 150 Kg/ha.

4. Anthracnose - *Colletotrichum capsici*



Symptoms

- The pathogen infects the seedlings and produces small reddish circular spots on the cotyledons and primary leaves.
- The lesions develop on the collar region, stem may be girdled, causing seedling to wilt and die.
- In mature plants, the fungus attacks the stem, leading to stem splitting and shredding of bark.
- The lint is stained to yellow or brown, becomes a solid brittle mass of fibre.

Favourable Conditions

- Prolonged rainfall at the time of boll formation
- Close planting.

Management

- Treat the delinted seeds with Carbendazim or Carboxin or Thiram or Captan at 2g/kg.
- Remove and burn the infected plant debris and bolls in the soil.
- Spray the crop at boll formation stage with Mancozeb 2kg or Copper oxychloride 2.5 kg or or Carbendazim 500g/ha.

5. Grey or Areolate mildew - *Ramularia areola***Symptoms**

- The disease usually appears on the under surface of the bottom leaves when the crop is nearing maturity.
- Irregular to angular pale translucent lesions which measure 1-10 mm (usually 3-4 mm) develop on the lower surface, usually bound by vein lets.
- A frosty or whitish grey powdery growth, consisting of conidiophores of the fungus, appears on the lower surface of leaves.
- The infection spreads to upper leaves and entire plant may be affected.

Favorable Conditions

- Wet humid conditions during winter cotton season,
- Intermittent rains during North-East monsoon season,

- Low temperature (20-30°C) during October-January,

Management

- Avoid excessive application of nitrogenous fertilizers/manures.
- Spray the crop with Carbendazim at 500g/ha, repeat after a week.
- Grow the resistant varieties like Sujatha and Varalakshmi.

6. Leaf blight - *Alternaria macrospora***Symptoms**

- The disease may occur in all stages but more severe when plants are 45-60 days old.
- Small, plate to brown, irregular or round spots, measuring 0.5 to 6mm diameter, may appear on the leaves.
- The affected leaves become brittle and fall off.

Favorable Conditions

- High humidity.
- Intermittent rains.
- Moderate temperature of 25-28° C.

Management

- Spray Mancozeb 2 kg or Copper oxychloride at 2kg/ha at the intimation of the disease. Four to five sprays may be given at 15 days interval.

7. Bacterial blight- *Xanthomo asaxonopodis* pv. *malvacearum*



Symptoms

The bacterium attacks all stages from seed to harvest. Usually five common phases of symptoms are noticed.

(i) Seedling Blight

- Small, water-soaked, circular or irregular lesions develop on the cotyledons, later, the infection spreads to stem through petiole and cause withering and death of seedlings.

(ii) Angular leaf spot

- Small, dark green, water soaked areas develop on lower surface of leaves, enlarge gradually and become angular when restricted by veins and veinlets and spots are visible on both the surface of leaves.

(iii) Vein Blight or Vein necrosis or black vein:

- The infection of veins cause blackening of the veins and veinlets, gives a typical 'blighting' appearance.
- The affected leaves become crinkled and twisted inward and show withering.

(iv) Black Gram

- On the stem and fruiting branches, dark brown to black lesions are formed, which may girdle the stem and branches to cause premature drooping off of the leaves, cracking of stem and gummosis, resulting in breaking of the stem and hang typically as dry black twig to give a characteristic "black arm" symptom.

(v) Square rot/Boll rot

- On the bolls, water soaked lesions appear and turn into dark black and sunken irregular spots.
- The infection slowly spreads to entire boll and shedding occurs.
- The infection on mature bolls lead to premature bursting.

Favorable Conditions

- Optimum soil temperature of 28°C,
- High atmospheric temperature of 30-40°C,
- Relative humidity of 85 per cent, early sowing,
- Delayed thinning,

Management

- Grow resistant varieties like Sujatha, 1412 and CRH 71.
- Spray with Streptomycin sulphate +Tetracycline mixture 100g along with Copper oxychloride at 1.25 Kg/ha.

8. Leaf curl Disease- Cotton Leaf curl virus



Symptoms

- Downward and upward curling of leaves and thickening of veins and enation on underside of leaves are the characteristic symptoms of the disease.
- In severe infection all the leaves are curled and growth retarded.

Management

- Elimination of volunteer perennial cotton and alternate hosts including malvaceous hosts like wild okra
- Use of fungus *Paecilomyces farinosus* which parasitizes *B.tabaci*. It brings down vector population.
- Foliar application of neem leaf extract and 1% neem oil resulted in 80% reduction of virus transmission.

9. Stenosis or Small leaf - Phytoplasma

Symptoms

- The disease appears when the plants are two to three months old and affected plants are stunted.
- The leaves are disfigured and variously lobed. Flowers remain small with abortive ovary.
Root system is poorly developed and can be easily pulled out.
- Sometimes, the disease affects only the base of the plant, resulting in the formation of clump of short branches which bear small and deformed leaves

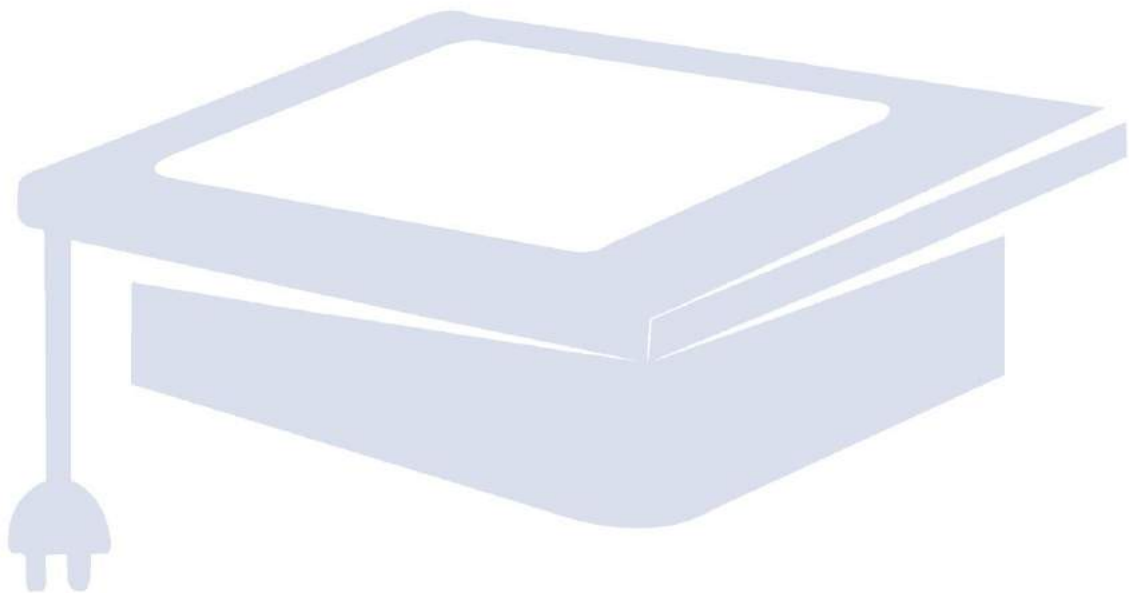
Management

- Rogue out the infected plants periodically.
- Cotton varieties developed from *Gossypium hirsutum* and *G. barbadense* are found to be resistant to the disease.



MINOR DISEASES

1. Leaf Spot
2. Myrothecium Leaf Spot
3. Rust
4. Sooty Mould



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