Diseases of Gram Crop

Gram Crop

Alternaria blight: *Alternaria alternata*

Symptom

- The disease occurs during the flowering stage of the crop.
- Leaves are infected most.
- Shedding of lower leaves generally occurs in the infected plant.
- The lesions are seen on leaflets as water soaked, small, circular and purple in colour.
- Infected pods turn blackish in colour.
- Infected seeds get shriveled.

Management

- The plants should be planted distantly.
- Avoid excessive vegetative growth.
- Intercrop with linseed.
- Avoid excessive irrigation.
- Use Mancozeb at the rate of 2.5g/lit or Use Carbendazim at 1g/lit

Ascochyta blight:*Ascochyta rabiei*

Symptom

- All plant parts are affected.
- Symptoms appear on leaves as water soaked lesions.
- Symptoms include smaller circular brown spots on leaves.
- Under favorable conditions, these spots enlarge rapidly and coalesce, blighting the leaves and buds.
- In case of severe infection, the entire plant dries up suddenly.
- The lesions are also developed on stems and petioles.
- Late infections result in shriveled and infected seed.
- The disease is seed borne in nature.
- Left over debris in the fields serve as a source.
- Wet and warm weather, and dense crop canopy are conducive to the spread of the disease

Ascochyta Blight- Ascochyta rabiei

Ascochyta blight on chickpea pods

Chickpea plants infected with Ascochyta blight

Ascochyta blight *Ascochyta rabiei*

Ascochyta blight symptoms on chickpea stem

Ascochyta blight lesion on chickpea flower

Ascochyta leaf Blight




Ascochyta lesions on the leaf of a chickpea leaves.

Management

- Sow disease-free seed.
- Follow rotation crop.
- Intercrop with wheat, barley, mustard
- Use compact varieties and Plant resistant varieties/tolerant varieties like G-543, Pusa-256, Gaurav, GNG-146, PBG-1 etc
- Seed treatment with Carbendazim @ 1g/kg of seed. or Hot water seed treatment (52 C for 10 min) to lower the infestation.
- Spray the crop with Mancozeb @ 2.5g/lit if noticed during the growth period or Spray Wettable sulphur at the rate of 2.3g/lit of water.

Botrytis gray mold- *Botrytis cineria*

Symptom

- Lack of pod setting is the first indication.
- Under favourable conditions, foliage shows symptoms and plants often die in patches.
- Shedding of flowers and leaves, covered with spore mass can be seen.
- Lesions on stem are 10-30 mm long and girdle the stem fully.
- Tender branches break off at the point where the gray mold has caused rotting.
- Affected flowers turn in to a rotting mass.
- Lesions on the pod are water-soaked and irregular.
- On infected plants, the pods contain either small, shriveled seeds or no seeds at all.

Grey Mold- Botrytis Stem and Pod Rot

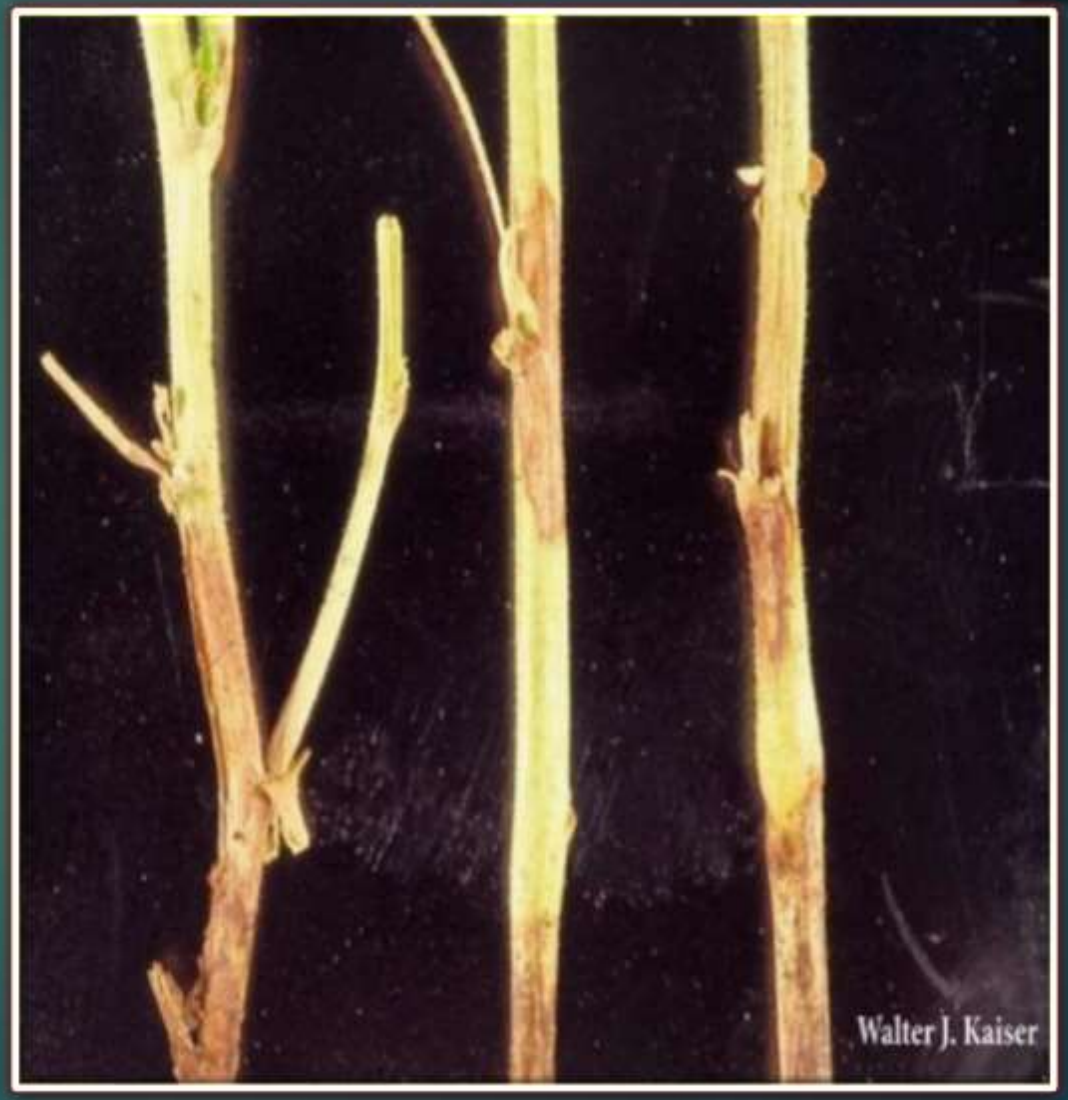
Causal Organism- *Botrytis cinerea*

Symptoms

- Water soaked lesions on any aerial parts of the plant are indicative of infection, with the growing tips and flowers being the most susceptible.
- After some time, the lesions change to gray or dark brown and take on a fuzzy appearance as a result of the hairy sporophores and masses of conidia.

- The stem may be girdled by the lesions and the leaves often turn into a rotting mass.
- The dead tissues could have tiny, black sclerotia that form on them.
- If the disease moves to pods, the seed may not form or they may shrivel or become discolored. Frequently flowers and pod drop leads to low grain yields.


Walter J. Kaiser


Walter J. Kaiser

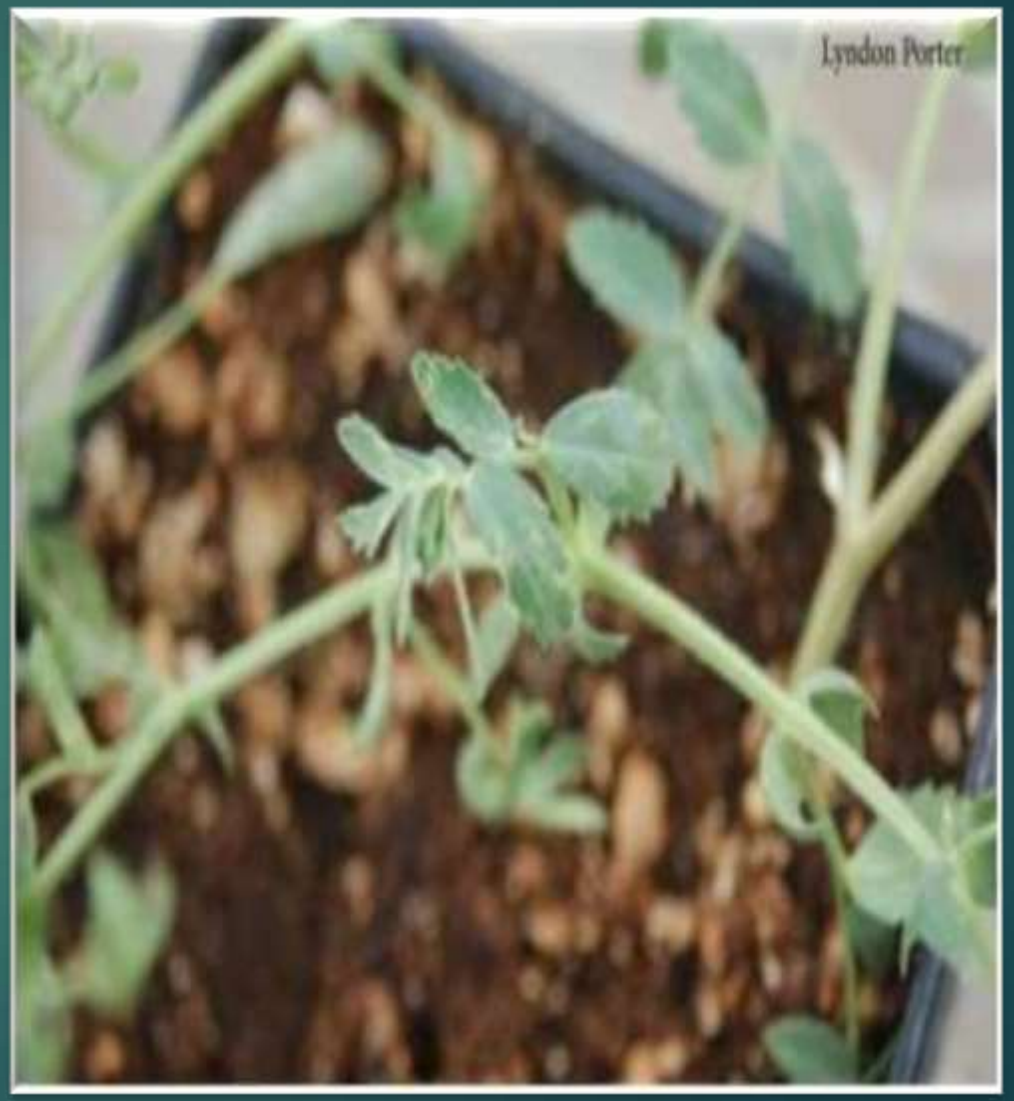
Management

- Avoid excessive vegetative growth.
- Intercrop with linseed.
- Avoid excessive irrigation. Use compact varieties.
- Deep summer ploughing Reduce plant density and increase in air passage between the plants.
- Seed treatment with Carbendazim + Thiram (1:1) @ 3g/kg of seed is recommended or Spray the crop with Captan 5 - 6 kg/ha at 15 days interval./Spray of Carbendazim @ 1.5g/lit of water is recommended./Spray Mancozeb @3 g/lit of water.

PEMV-Pea enation Mosaic Virus

- Leaves tend to be twisted, malformed, mottled, and may roll. Vein clearing, translucent flecks, and yellowing can also be observed.
- Enations(hyperplastic outgrowths), could form on leaf and pod surfaces and pods may fill poorly. If they are infected at an early age, the plants may die or not produce seed of any quality, especially if co- infected with another virus.


Lyndon Porter


Lyndon Porter

Collar rot-*Sclerotium rolfsii*

Symptom

- It comes in the early stages i.e up to six weeks from sowing.
- Drying plants whose foliage turns slightly yellow before death, scattered in the field is an indication of the disease.
- Seedling become chlorotic.
- The joint of stem & root turns soft slightly contracts and begins to decay.
- Infected parts turn brown white.
- Black dots, like mustard in shape known as sclerotia are seen appearing on the white infected plant parts

Management

- Deep ploughing in summer.
- Avoid high moisture at the sowing time.
- Seedlings should be protected from excessive moisture.
- Grow disease resistant varieties like G-543, Gaurav, Pusa-261 etc.
- Destroy the residues of last crop and weed before sowing and after harvest.
- All un decomposed matter should be removed from the field before land preparation.
- Treat the seeds with a mixture of Carbendazim 1g per kg of seed.
- Treat the soil with a mixture of fungicides like Brassicol and Captan at the rate of 10 kg per hectare.

Dry root rot: *Rhizoctonia bataticola /Macrophomina phaseolina*

Symptom

- The disease appears from flowering to podding stage as scattered dried plants.
- The leaves and stem are become straw colored.
- Affected plants wither and spread across the entire field.
- The roots of infected plants become brittle and dry.

Management

- Deep ploughing in summer
- Grow cultivars resistant to dry root rot.
- Drought should be avoided.
- Sowing should always be done on the recommended time.
- Germinating and young seedlings should be saved from high temperatures.
- Seed treatment with *T. viride* @4g/kg or *P. fluorescens* @ 10g/ kg of seed or Carbendazim or Thiram 2g/kg of seed.
- Spot drenching with Carbendazim 1g/lit or *P. fluorescens* / *T. viride* 2.5 kg/ha with 50 kg FYM.

Wet Root Rot- Rhizoctonia solani

Reddish to dark brown root lesions can develop on epicotyls and hypocotyls.

Brown discoloration occurring near the soil line on the epicotyls could girdle the stem.

Seeds may rot, or when growing, develop rot or pre and post-emergent damping-off.

- Lesions developing on roots that eventually progress enough to pinch them off can be observed. Stems lesions can develop at or below the soil line.

- The lesions may expand above the soil line to the lower branches in older plants. Leaves can turn yellow upwards from the base of the plants.

- Circular patches of stunted plants may be observed in the field.

- A plant that can be easily pulled out from the soil is indicative of rot.

Fusarium wilt:*Fusarium oxysporum f.sp.ciceri*

Symptom

- The disease can affect the crop at any stage.
- The field symptoms of wilt are dead seedlings or adult plants, usually in patches.
- At seedling stage, 3-5 weeks after sowing, whole seedlings collapse and lie flat on the ground with dull green leaves and shrunken stem.
- Dark drown or dark discoloration of the internal stem tissues is visible.
- At adult stage, drooping of petioles, rachis and leaflets and finally entire plant occurs.

- Root tissue may die and becomediscolored, leading to less branching and fewer feeder roots. Low emergence and seed rot could occur.
- Discoloration of the crown and hypocotyl's tissue may be observed as rotting progresses.
- Stunting of plants is common and some plants can die before flowering, leading to reduced yield.
- Factors favoringSome factors that favor infection include low soil temperatures, wet soil, and poorly drained or heavy clay soils.
- Thinner seed coat variety are more susceptible.(Ex. Kabuli)

Downy Mildew- *Peronospora sp*.

Downy Mildew *Causal Organism: Peronospora sp.*

- The disease is often exhibited in a few branches, leading to curled or twisted leaves and dwarfed tips.
- The symptoms may appear on any aerial part of the plant with white mycelial patches appearing first on the lower leaf surfaces, then chlorotic to yellow spots on the upper surface.

- Fine, dirty, pinkish tufts of fungal growth are often formed on leaf surfaces under cool and humid conditions, which may disappear when dry conditions take over, resulting in yellowing symptoms. The chlorotic spots then become dark and brittle.
- Stunting and bushy apical growth with small leaflets is typical. The affected plants can also lose all their leaves, resulting in reduced yield and seed size.

Rust- *Cicer arietini*

- At first, small, round, brown spots (pustules) appear. The pustules are sometimes surrounded by chlorotic halos. They often appear in a ring pattern. These may combine later and turn dark. If the infection is severe, the leaves may drop off.+

Rust

Fusarium Wilt *Fusarium oxysporum* f.sp. *ciceri*

Fusarium wilt on seedlings and

Fusarium wilt on mature plant. Note : Vascular discoloration.

Management

- In fields having heavy incidence of gram wilt, the cultivation of chick pea should be avoided for three to four years.
- As far as possible sowing of chick pea should not be done before third week of October.
- Deep planting of chick pea about 8-10 centimeters deep in the light soils reduces the gram wilt incidence.
- Avoid sowing when temperatures are high.
- Follow 6-year crop rotations with sorghum
- Grow the resistant varieties like C-214, Avrodhi, Uday, BG-244; Pusa-362, JG-315, Phule G-5 etc.
- Apply FYM 10-15 cart load/ha.
- Seed treatment with *T. viride* @4g/kg or *P. fluorescens* @ 10g/ kg of seed or Carbendazim or Thiram 2g/kg of seed.
- Spot drenching with Carbendazim 1g/lit or *P. fluorescens* / *T. viride* 2.5 kg/ha with 50 kg FYM.
- Seed treatment with Carbendazim at the rate of 1g/kg of seed /

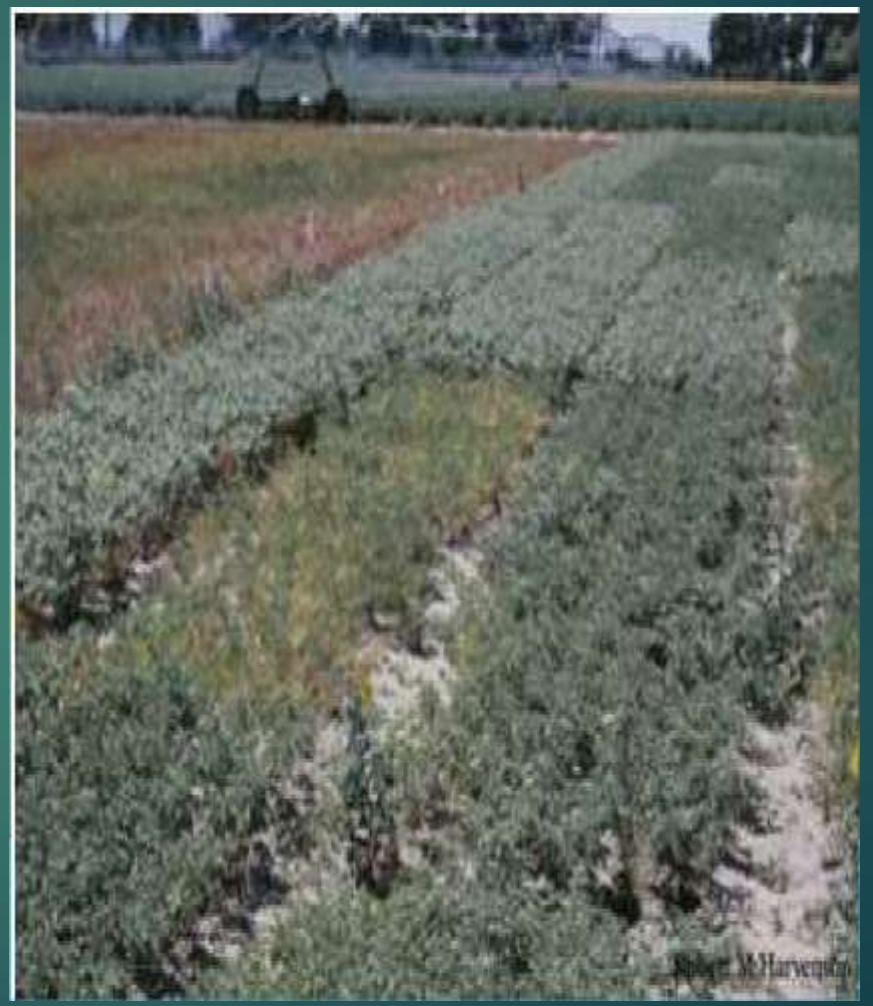
Black Root Rot *Causal Organism: Fusarium solani*

- General symptoms include yellowing and wilting of scattered plants, rotten root system, shedding of finer roots, and remaining roots turning black. Factors favoringHigh moisture and high temperature favor this pathogen.

Symptoms

Black Root Rot *Causal Organism: Fusarium solani*

Black Root Rot



Black Root Rot *Causal Organism: Fusarium solani*

Powdery mildew:*Oidiopsis taurica*

Symptom

- Crop plants of all the age group are affected.
- With the onset of the disease white powdery mass appear on the leaves.
- Small patches of white powder coating initially develop on both surfaces of older leaves.
- Affected leaves turn purple and then die.
- When infection is severe, stems, young leaves, and pods are also covered with the powdery coating

Management

- Field and crop sanitation.
- Dithane M-45 or Carbendazim at 2.5 g/lit should be sprayed.

Sclerotinia stem rot (White mold)
Sclerotinia sclerotiorum

- Plants rapidly wilting and dying, often without turning yellow; as plants dry out they may turn straw yellow in color; small black fungal bodies (sclerotia) may be present on the surface of the root just below the soil line together with white fluffy mycelium; water soaked lesions may be present on the stem in Spring; infected tissues dry out and may become covered in white mycelium
- **Cause**
- Fungus
- **Comments**
- Disease emergence favors very wet weather conditions; disease is usually introduced to non-infected areas by infected seed
- **Management**
- Plant only certified seed; if disease is known to present rotate crops with non-hosts such as cereals; if problem is severe then a 4 year rotation away from susceptible plants may be required; there are no seed treatments or fungicides available to treat the disease

Symptoms

THANKS