DISEASES OF CASTOR

List of diseases:

- ✓ **Seedling blight - *Phytophthora parasitica***
- ✓ **Rust – *Melampsora ricini***
- ✓ **Leaf blight- *Alternaria ricini***
- ✓ **Brown leaf spot - *Cercospora ricinella***
- ✓ **Powdery mildew - *Leveillula taurica***
- ✓ **Stem rot - *Macrophomina phaseolina***
- ✓ **Wilt - *Fusarium oxysporum***
- ✓ **Grey mould - *Botrytis ricini***
- ✓ **Bacterial leaf spot - *Xanthomonas campestris* pv. *ricinicola***
- ✓ **Bacterial wilt - *Pseudomonas solanacearum***

Seedling blight - *Phytophthora parasitica*

Symptoms:

- The disease appears circular, dull green patch on both the surface of the cotyledon leaves.
- It later spreads and causes rotting.
- The infection moves to stem and causes withering and death of seedling.
- In mature plants, the infection initially appears on the young leaves and spreads to petiole and stem causing black discoloration and severe defoliation.

Spots on older leaves

Leaf blighting

Dead seedling

Pathogen:

- Non-septate and hyaline mycelium.
- Sporangiophores emerge through the stomata they are unbranched and bear single celled, hyaline, round or oval sporangia at the tip singly.
- The fungus also produces oospores and chlamydospores in adverse seasons.
- Asexual spore: zoospore
- Sexual spores: oospore

Favourable Conditions

- Continuous rainy weather.
- Low temperature (20-25˚C).
- Low lying and ill drained soils.

Disease cycle

- ✓ The pathogen remains in the soil as chlamydospores and oospores which act as primary source of infection.
- ✓ The secondary spread takes place through wind borne sporangia.

Management:

- ✓ Remove and destroy infected plant residues.
- ✓ Avoid low-lying and ill drained fields for sowing.
- ✓ Treat the seeds with thiram or captan at 4g/kg.
- ✓ Seed treatment with *Trichoderma viride* @4g/Kg of seed or Metalaxyl 3g per kg seed
- ✓ Soil drenching with COC 3g/lit or Metalaxyl 2g/lit.

Rust – *Melampsora ricini*

Symptoms:

- ✓ Minute, orange-yellow coloured, raised pustules appear on the lower surface of the leaves
- ✓ Corresponding upper surface of the leaves becomes yellow.
- ✓ Pustules are grouped in concentric rings and coalesce .
- ✓ Drying and defoliation takes place.

Pathogen:

- The pathogen produces uredosori in castor plants and other stages of the life cycle are unknown.
- Uredospores are two kinds, one is thick walled and other is thin walled. They are elliptical to round, orange-yellow coloured

Disease cycle:

- The fungus survives in the self sown castor crops in the off season.
- It can also survive on other species of *Ricinus*.
- The infection spreads through airborne uredospores

Management:

- Rogue out the self-sown castor crops and other weed hosts.
- Spray Mancozeb at 2kg/ha or Propioconazole 1lit/ha.

Leaf blight- *Alternaria ricini*

Symptoms:

- ✓ Irregular brown spots with concentric rings form initially on the leaves and covered with fungal growth.
- ✓ The spots coaleasce to form big patches, premature defoliation occurs.
- ✓ The stems, inflorescences and capsules are also show dark brown lesions with concentric rings.
- ✓ On the capsules, initially brown sunken spots appear, enlarge rapidly and cover the whole pod.
- ✓ The capsules crack and seeds are also get infected.

Pathogen

- Conidia are muriform, light olive in colour with 5-16 cells transverse and longitudinal septa with a beak at the tip.

Favourable Conditions

- High atmospheric humidity (85-90 %).
- Low temperature (16-20˚C)

Disease cycle:

- The pathogen survives on hosts like *Jatropha pandurifolia* .
- The pathogen is externally and internally seed-borne and causes primary infection.
- The secondary infection is through air-borne conidia.

Management:

- Treat the seeds with captan or thiram at 2g/kg.
- Remove the reservoir hosts periodically.
- Spray mancozeb at 2.5g/lit

Brown leaf spot - *Cercospora ricinella*

Symptoms:

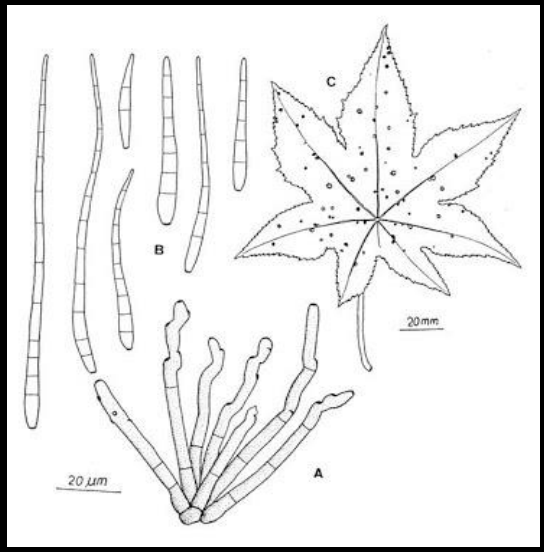
- The disease appears as minute brown specks surrounded by a pale green halo.
- The spots enlarge to greyish white centre portion with deep brown margin.
- several spots coalesce, large brown patches appear but restricted by veins.
- Infected tissues often drop off leaving shot-hole symptoms.
- In severe infections, the older leaves may be blighted and withered.

Pathogen:

- The fungal hyphae collect beneath the epidermis and form a hymenial layer.
- Clusters of conidiophores emerge through stomata or epidermis.
- They are septate and unbranched with deep brown base and light brown tip.
- The conidia are elongated, colourless, straight or slightly curved, truncate at the base and narrow at the tip

Favourable Conditions:

- High atmospheric humidity 85-90 %
- low temperature 16-20ºC



Disease cycle:

- ✓ The pathogen remains as dormant mycelium in the plant debris.
- ✓ The disease mainly spreads through wind borne conidia.

Management:

- ✓ Use of resistant varieties would be the most effective method for combating the disease.
- ✓ Spraying twice with Mancozeb 2g/lit or Carbendazim 500g/ha at 10-15 day interval reduces the disease incidence.
- ✓ Treat the seed with thiram or Captan 2gm/kg seed.

Grey Mold - *Botrytis ricini*

- The entire group of flowers is attacked and converted to a prominent wooly mass of fungal growth.
- It also affects leaves and stems by infection from racemes.
- First symptoms are small, blackish spots from which drops of yellow may exude.
- Fungal threads which grow from these spots spread the infection and produce the characteristic wooly appearance of the inflorescence.

Capsule Molds (Many fungi - *Alternaria* sp., *Penicillium* sp., and *Fusarium* sp.)

- Capsules are attacked at an early stage of development.
- Capsules have distinctive bluish color in early stages. Color may become darker or black in later stages of development.

Bacterial Leaf Spot - *Xanthomonas campestris pv. ricini*

- Numerous, irregular, small, brown water-soaked spots occur on leaves, followed by premature defoliation.

- Spots gradually turn black with dried sections of leaf tissue disintegrating and falling from leaves.

- Racemes are attacked under humid conditions. Serious losses may occur under humid conditions.

Bacterial wilt - *Pseudomonas solanacearum*

- Leaves dry up, turn black and fall.

- Branches also turn black, and stems may be affected, in which case the plants usually die.

Minor diseases

Powdery mildew	*Leveillula taurica*	White cottony growth on the lower surface of leaves with yellow discolouration on upper surface.

Stem rot	*Macrophomina phaseolina*	Black discolouration appears near base of stem leading to withering and drying.
Bacterial leaf spot	*Xanthomonas campestris* pv. *ricinicola*	Water soaked lesions appear, which later become brown and angular with shining beads of bacterial oozing.