

## 10. Diseases of Castor

### 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.



Dead seedling



Spot on older leaf



Leaf blight symptom

#### Pathogen

The pathogen produces non-septate and hyaline mycelium. [Sporangiophores](#) emerge through the stomata on the lower surface singly or in groups. They are unbranched and bear single celled, hyaline, round or oval sporangia at the tip singly. The [sporangia](#) germinate to produce abundant [zoospores](#). The fungus also produces [oospores](#) and [chlamydospores](#) in adverse seasons.

#### 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 fungus also survives on other hosts like potato, tomato, brinjal, sesamum etc. 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.

### Rust – *Melampsora ricini*

#### Symptoms

Minute, orange-yellow coloured, raised pustules appear with powdery masses on the lower surface of the leaves and the corresponding areas on the upper surface of the leaves are yellow. Often the pustules are grouped in concentric rings and coalesce together to for drying of leaves.



Powdery mass covering entire leaf

#### Pathogen

The pathogen produces only 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 and finely warty.

#### 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 fungus also attacks *Euphorbia obtusifolia*, *E.geniculata* and *E.marginata*. 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](#) 1l/ha.

## Leaf blight- [Alternaria ricini](#)

### Symptoms

All the aerial parts of plants viz., leaves, stem, inflorescences and capsules are liable to be attacked by the pathogen. Irregular brown spots with concentric rings form initially on the leaves and covered with fungal growth. When the spots coalesce 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.



*Alternaria* leaf spot with concentric rings

### Pathogen

The pathogen produces erect or slightly curved, light grey to brown conidiophores, which are occasionally in groups. Conidia are produced in long chains. Conidia are obclavate, light olive in colour with 5-16 cells having 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](#) and *Bridelia hamiltoniana*. 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 2kg/ha.

## 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. The spots may be 2-4 mm in diameter and when 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.



Spots on leaf

### Pathogen

The pathogen 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 with 2-7 septa.

### Disease cycle

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

## Management

- Spraying with 1% [Bordeaux mixture](#) or [Copper oxy chloride](#) @ 0.2% may help to bring the disease under check; but where the cultures of Eri-silk worm are maintained on castor plants, spraying would not be desirable.
- 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.

### **Powdery mildew - [Leveillula taurica](#)**

#### **Symptoms**

It is characterized by typical mildew growth which is generally confined to the under-surface of the leaf. When the infection is severe the upper-surface is also covered by the whitish growth of the fungus. Light green patches, corresponding to the diseased areas on the under surface, are visible on the upper side especially when the leaves are held against light.



Powdery mass covering entire leaf

#### **Management**

- When weather is comparatively dry spray twice with wettable Sulphur 2g/lit at 15 days interval, starting from 3 months after sowing.
- Spray 1ml hexaconazole or 2ml dinocap / litre of water at fortnight intervals. The variety Jwala is resistant to this disease.

### **Stem rot - [Macrophomina phaseolina](#)**

#### **Symptoms**

Small brown depressed lesions on and around nodes. Increase in size on both directions causing 2 to 20 cm necrotic area. Lesions often coalesce and girdle the stem causing leaf drop.

Drying and death starts from apex and progress. Infected capsules discoloured and drop easily. Sudden wilting of plants in patches under high moisture stress coupled with high soil temperature. Plant exhibit symptoms of drought and drooping of leaves. At ground level black lesions are formed on the stem. Young leaves curl inwards with black margins and drop off later, such branches Die-back. Entire branch and top of the plant withers.



Affected plant showing drooping of leaves

### Management

- Grow tolerant and resistant varieties like Jyothi, Jwala, GCH-4, DCH-30 and SHB-145.
- Avoid water logging.
- Destruction of crop debris.
- Selection of healthy seed.
- Providing irrigation at critical stages of the crop.
- Treat the seed with thiram @ 2g/kg or carbendazim at 2g/ kg seed.
- Seed treatment with [\*Trichoderma viride\*](#) formulation at 4g/kg of seed.
- Soil drenching with Carbendazim (1g/1 litre of water) 2-3 times at 15 days interval.

### Bacterial leaf spot - *Xanthomonas campestris* pv. *ricinicola*

#### Symptoms

The pathogen attacks cotyledons, leaves and veins and produces few to numerous small round, water-soaked spots which later become angular and dark brown to jet black in color. The spots are generally aggregated towards the tip. At a later stage the spots become irregular in shape particularly when they coalesce and areas around such spots turn pale-brown and brittle. Bacterial ooze is observed on both the sides of the leaf which is in the form of small shining beads or fine scales.



Pustules on lower leaf surface

### Management

- Field sanitation help in minimizing the yield loss as pathogen survives on seed and plant debris.
- Hot water treatment of seed at 58°C to 60°C for ten minutes.
- Grow tolerant varieties.
- Spray Copper oxychloride 2kg/ha or [Streptocycline](#) 100g/ha or Paushamycin 250g/ha.

### Wilt - [Fusarium oxysporum](#)

#### Symptoms

When seedlings are attacked cotyledonary leaves turn to dull green colour, wither and die subsequently. Leaves are droop and drop off leaving behind only top leaves. Diseased plants are sickly in appearance. Wilting of plants, root degeneration, collar rot, drooping of leaves and necrosis of affected tissue and finally leading to death of plants. Necrosis of leaves starts from margins spreading to interveinal areas and finally to the whole leaf. Spilt open stem shows brownish discolouration and white cottony growth of mycelia much prominently in the pith of the stem.



### Symptoms

### Management

- Selection of disease free seeds.
- Grow tolerant and resistant varieties like Jyothi, Jwala, GCH-4 DCH-30 and SHB 145.
- Avoid water logging
- Burning of crop debris
- Green manuring and intercropping with red gram
- Treat the seeds with thiram @ 2g/ kg or carbendiazim @ 2g/ kg seed.
- Seed treatment with 4g of *Trichoderma viride* talc formulation.
- Multiplication of 2kg of *T.viride* formulation by mixing in 50kg farm yard manure
- Sprinkling water and covering with polythene sheet for 15days and then applying between rows of the crops is helpful in reducing the incidence.

