

DISEASES OF LINSEED
(Linum usitatissimum)



Dr. S. Parthasarathy, M.Sc. (Ag)., Ph.D., FBSS.
Assistant Professor (Plant Pathology),
Dept. of Plant Pathology,
College of Agricultural Technology, Theni

Diseases of Linseed

- **Rust** - *Melampsora lini*
- **Wilt** - *Fusarium oxysporum f.sp. lini*
- **Powdery mildew** – *Oidium lini*
- **Brown stem blight**- *Alternaria linicola*
- **Damping-off, root rot, and seedling blight**- *Fusarium, Rhizoctonia, Pythium*
- **Pasmo or septoria leaf spot**- *Septoria linicola*
(*Mycosphaerella linicola*)

Minor diseases

- **Aster yellows** - **Phytoplasma**
- **Crinkle** - **Oat blue dwarf virus**

Rust - *Melampsora lini*

Symptoms:

- Bright orange and powdery pustules develop on leaves, stems and bolls but mostly on the underside of the leaves .
- As the season progresses, the orange pustules turn black and produce overwintering teliospores .
- Early infections may completely defoliate flax plants and reduce the seed yield



Uredospore



Teliospore



Favourable conditions:

- **High humidity during cool nights and warmer day temperatures**

Management

- **Destruction of plant debris from the diseased field.**
- **Seed treatment with Oxycarboxin.**
- **Spray of fungicides like oxathin derivatives, Dithane M-45, Cuman L.**

Fusarium Wilt - *Fusarium oxysporum* f. sp. *lini*

Symptoms :

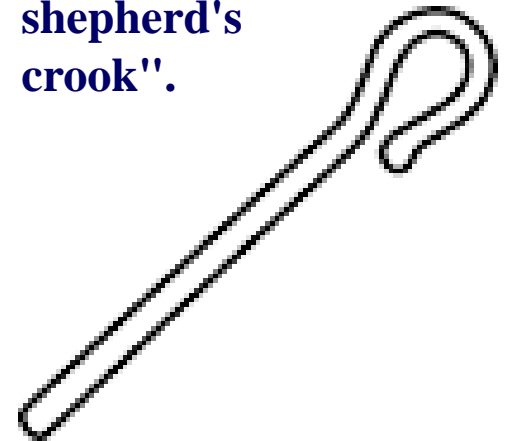
- Yellowing and wilting of leaves, followed by browning and death of the plant.
- The roots of dead plants appear ash-grey.
- The tops of wilted plants often turn downward, forming a "shepherd's crook".
- Warm weather favours the disease

Mode of spread :

- Seed-borne and soil-borne fungus
- The fungus persists in the soil, while the mycelia and spores survive for many years in debris of flax and other organic tissue.
- Wind-blown and run-off soil may spread the fungus from one field to another.



shepherd's
crook".





Macroconidia



Microconidia

Management :

Crop rotation of at least 3 years.

Seed treatment with Thiram or carbendazim @ 2.5g/kg seed.

Soil drenching with Carbendazim @ 0.1 % or COC @ 0.25%

Septoria leaf spot – *Septoria linicola* (*Mycosphaerella linorum*)

Symptoms:

- Circular and brown lesions on the leaves.
- **Brown to black infected bands that alternate with green and healthy bands on the stem.**
- All the aerial parts of the plants are affected especially leaves causing necrosis.

Pathogen

- Asexual fruiting body – pycnidia.
- Conidia – needle shaped
- Sexual fruiting body - perithecia



FC:

High moisture and warm temperatures

Mode of spread:

Spores are dispersed by rain and wind.

Management

- **Seed treatment with Thiram 4g/kg**
- **Four sprays with Dithane M-45(0.3%), Benomyl (0.1%).**

Powdery mildew – *Oidium lini*

Symptoms :

- White powdery mass of mycelia that starts as small spots and rapidly spreads to cover the entire leaf surface .
- Heavily infected leaves dry up, wither and die.
- Early infections may defoliate the flax plant and reduce the yield and quality of seed

Pathogen

- Oidium type
- Short conidiophore on which barrel shaped conidia bear
- Sexual fruiting body –Chasmothecium

Management

- Wettable sulphur @3%
- Karathane 0.2%



Seedling Blight and Root Rot - *Fusarium*, *Pythium* and *Rhizoctonia*

Symptoms:

- Blighted seedlings turn yellow, wilt and die.
- Root rot symptoms appear in plants after the flowering stage.
- Roots of affected plants show red to brown lesions, and may later turn dark and shrivel.
- Plants may wilt on warm days, and turn brown prematurely; plants with root rot usually set little or no seed.

Management

- Crop rotation
- Soil drenching with Carbendazim @ 0.1 per cent



Aster yellow - Phytoplasma

Symptoms:

- **Yellowing, malformation of the flowers, and stunted growth.**
- **All flower parts including the petals are converted into small, yellowish green leaves .**
- **Diseased flowers are sterile and produce no seed.**
- **Overwinters in perennial broadleaved weeds and crops, but most infections are carried by leafhoppers**



Crinkle - *Oat blue dwarf virus*

Also causes disease in oats, wheat, and barley.

Symptoms:

- Puckering of leaves
- Stunted growth and reduced tillering.
- Flowering may appear normal but seed production is reduced.
- **Transmission by the six spotted leafhopper.**

Control: Early sowing to avoid the migrating leafhoppers in mid and late season.