

**Course- B.Sc. (Honours), Part -1**  
**Subject- Botany, Paper-II (Group-B)**  
**Topic- Rust of linseed.**

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## Rust of linseed

Rust of linseed is a common disease of flax growing areas of the world. In India flax is a major oilseed crop cultivated in almost all the states. The crop is generally cultivated during October-April.

The disease generally appears in February or later but Butler (1918) has observed the disease in central India in early November. At the time of crop harvesting the affected plants get a fired appearance due to the presence of telial sori.



*Linseed Rust (Linum usitatissimum)*

### Effects of the Rust of Linseed:

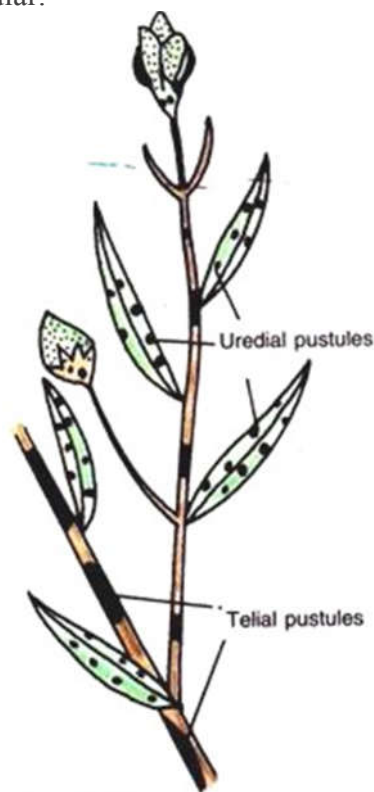
The disease causes disastrous effects on the plants. Once the disease sets in a field, most of the linseed fields in the locality get affected within no time. The disease generally appears in epidemic form.

Severely infected plants get mostly defoliated due to which starch formation is also reduced. Most of the food reserves of the host is consumed by the pathogen resulting in decrease in the yield of seeds and quality of fibres. Oil content of the seeds is also reduced.

### Symptoms of the Rust of Linseed:

The leaves are the first to show the symptoms and gradually all the aerial parts of the plant get infected. Large, orange coloured pustules generally appear on the leaves. Small pustules are initially surrounded by chlorotic areas. Little necrosis of the leaves is at first observed but it grows, becomes more general and the leaves prematurely die.

The pustules on the leaves are uredopustules containing uredospores. Uredopustules may also appear on stems. While the uredopustules on leaves are round and small, those on stems are elongated and irregular.



**Fig. 22.18.** Symptoms of Rust of Linseed.

Teleutopustules are generally produced on stems and rarely on leaves, if they have not been shed prematurely. Orange yellow uredopustules are often surrounded by reddish-brown teleutopustules. The contents of telial pustules do not break the epidermis of the host and remain buried subepidermally appearing glossy.

### **Causal Organism:**

The causal organism is *Melampsora lini* (Pers.) Lev.-an autoecious rust.

### **Disease Cycle:**

In temperate countries, primary infection takes place through basidiospores which are produced as a result of germination of teleutospores perennating in the soil. But in tropical countries, the teleutospores, produced at the end of growing season i.e. April-May, lose their viability due to excessive heat of summers.

Uredospores too are killed due to excessive temperatures. It is presumed that the uredospores produced on linseed at hills come down to plains to cause infection. Thus the primary inoculum, windblown, fall on the host, germinate and cause infection.

Because the transportation of uredospores from hills takes some time, the outbreak of the disease in plains takes place only after 2-3 months of the sowing of the crop.

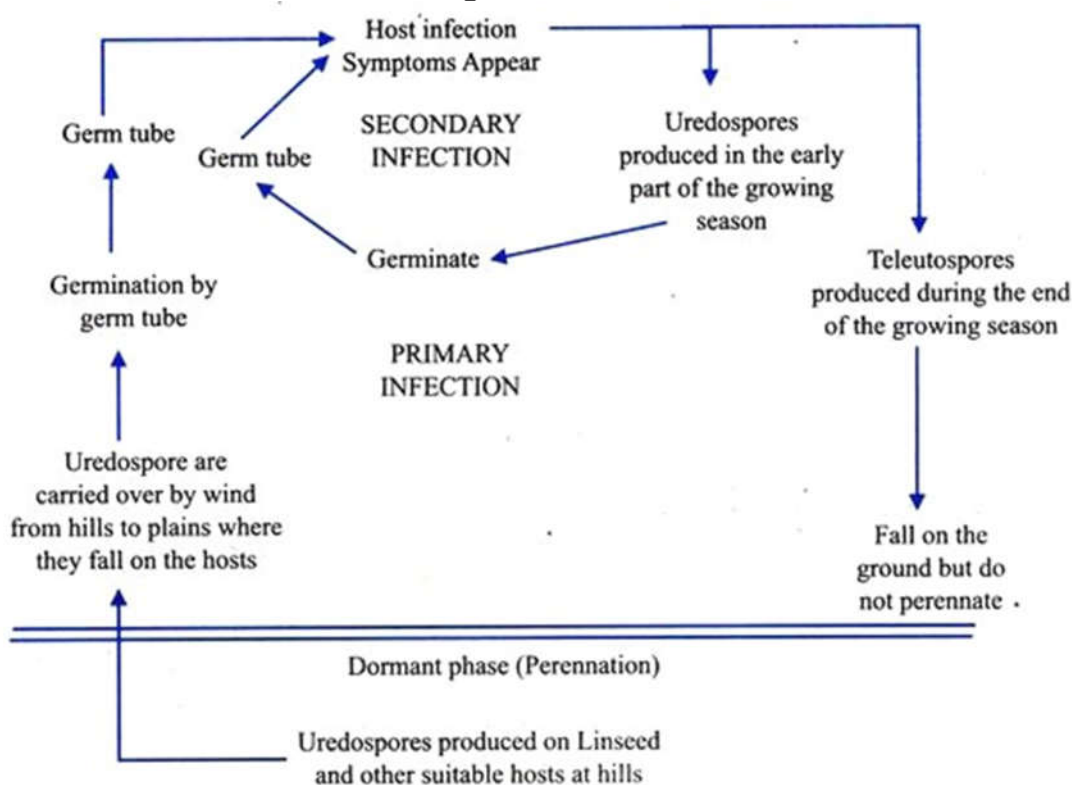
Uredospores produced as a result of primary infection cause secondary infection. Since the uredospores take very little time to germinate the secondary infection is caused

within a short time. Secondary infection along with primary infection cause heavy damage to the seed crop.

Teleutospores produced at the end of the growing season appear to have no role to play in the continuance of the life cycle of the rust.

### Control Measures of the Rust of Linseed:

- I. Use of disease resistant vars. like NP (RR) 9, 10, 56, 95, 218, 279B 279K3, 368, 381, 389, 415 and 501 is the only effective method to control the disease.
- II. Seed treatment to kill the teleutospores in hills has also been suggested.
- III. Avoidance of excessive nitrogenous manures is recommended.



**Fig. 22.19.** Disease cycle of Rust of Linseed.