

## Economic Effect of the Diseases in the cultivation of Rapeseed- Mustard and their Management

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### Alternaria Blight

**Causal organism** - *Alternaria brassicae* and *Alternaria brassicicola*  
Brassicaceae mycelium is septate brown to brownish grey. Conidiophores are septate branched and olivaceous in colour. Conidia are muriform long beaks born singly or in the acropetal chain. And *A. brassicicola* mycelium is septate grayish black in colour. Conidia are dark cylindrical to oblong muriform, without beak.

**Symptoms:** *Alternaria brassicae* and *Alternaria brassicicola* cause

almost similar symptoms on all aerial parts of the plant. The first symptoms appear on leaves as black points. Later these spots enlarge and develop into characteristic round spots with concentric rings. Grey-colored spots produced by *A. brassicae* whereas black sooty velvety spots are produced by *A. brassicicola*. Many spots coalesce to form large patches and causing blighting and defoliation of leaves. In general, the disease symptoms first appear on lower and older leaves. Infected siliquae contain shriveled and undersized seeds.



Symptoms of Alternaria blight

### Management:

- ❖ Burn crop debris of the previous year.
- ❖ Deep summer ploughing.
- ❖ Timely sowing of the crop.
- ❖ Use of disease-free healthy seeds.
- ❖ Avoid irrigation at susceptible stage (45 and 75 DAS) of the crop.
- ❖ Treat seed with thiram or carbendazim @2g/kg.
- ❖ Spray of iprodione (rovral) or Mancozeb @0.2% at fortnight intervals soon after the disease appearance.

### White Rust

**Causal organism** - *Albugo candida*

It is the obligate parasite fungus and mycelium is intercellular with numerous knob-shaped haustoria in the host cells. Mycelium is coenocytic hyaline smooth and branched. Sporangioophores are short club-shaped and thick toward their base conidia produced in the chain at their apex in a basipetal manner.

**Symptoms:** Symptoms appear in all aerial parts of the plant. The initial infection starts from the lower surface of leaves as white pustules which corresponds to a tan-yellow color on the

upper leaf surface. In case of local infection, isolated pustules develop on leaves and stems which are shiny white and 11-2 mm in diameter. In a later stage, pustules may appear in a concentric look with a yellow halo. When young stem and inflorescence are infected the fungus becomes systemic and stimulates various types of deformities in plants. Hypertrophy hyperplasia and stunting are induced by the fungus in the infected plant.

#### Management:

- ❖ Burn crop debris of the previous year.
- ❖ Deep summer ploughing.
- ❖ Timely sowing of the crop.
- ❖ Use of disease-free seeds.
- ❖ Avoid irrigation at susceptible stages (45 and 75 DAS) of the crop.
- ❖ Treat seed with Apron 35SD @ 6g/kg.
- ❖ Spray of iprodione (rovral) or Mancozeb @0.2% at fortnight intervals soon after the disease appearance.



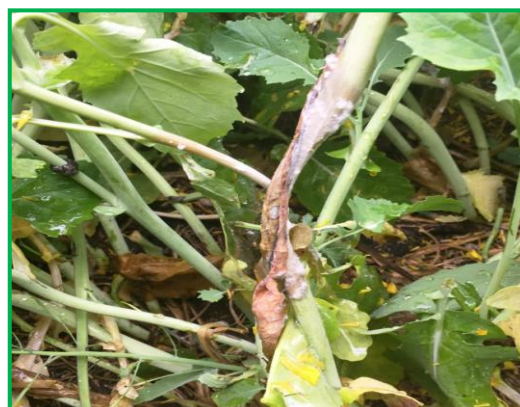
Symptoms of White Rust

#### Sclerotinia Blight (*Sclerotinia Stem Rot*)

##### Causal organism - *Sclerotinia sclerotiorum*

The Genus *Sclerotinia* mycelium is hyaline septate and singly branched. Sclerotia are pink but later turn into dark brown to black in colour and are smooth. They are globose if form on the host surface but elongated in too many shaped in pith.

**Symptoms:** Lesions develop on stem and leaf which are slightly sunken oval or elongated and water soaked. Elongated and water-soaked lesions are mostly developed on stems that are covered with cottony mycelial growth. The central pith is destroyed and filled with white mycelium later



Symptoms of Sclerotinia blight

becomes hard and black sclerotia are formed.

Black irregular bodies of the fungus are seen on and /or inside the affected plants. The affected plants show stunting and premature ripening shredding of stem wilting and drying.

#### Management:

- Deep ploughing during summer.
- Use of sclerotia-free seed for sowing.
- Rapeseed -mustard crops should be rotating with non-host crops.
- Spray carbendazim @0.1% twice during the flowering period at 20 days intervals.

#### Black Rot

##### Causal organism - *Xanthomonas campestris pv campestris*

The colonies of bacteria are circular raised and yellowish in colour. It is the gram-negative bacteria rod-shaped aerobic and motile by a single polar flagellum.

**Symptoms:** A symptom appears as typical V-shaped yellowing of the leaf tip or leaf margins which progress along with the vein. The lesion becomes brown and brittle and affected leaf veins turned dark brown to black in colour. The V-shaped lesions enlarge with time and the entire leaf becomes yellow. Later these affected leaves die and fall from the plant. Disease

symptoms on seedlings may also appear as stunted growth with dead spots on the cotyledons. Bacterial oozing may be seen on the infected parts.

#### Management:

- ❖ Use disease-free seed.
- ❖ Seed treatment in hot water at 122 0F for 30 minutes.
- ❖ Rogue out infected plants.
- ❖ Soak the seed in plantomycin at 100 ppm for 30 min.
- ❖ Foliar spray with streptomycin or agrimycine @ 100-200 ppm.

### Powdery Mildew

#### Causal organism - *Erysiphe cruciferarum*

The fungus is an obligate parasite. The mycelium is septate branched white in colour and entophytic. And conidiophores are short erect and septate. Conidia are cylindrical hyaline single-celled born singly or in the chain and germinate by germ tube. Cleistothecia are globose minute brown to black in colour with numerous myceloid appendages.

**Symptoms:** Symptoms are initiated as white circular floury patches appear on the upper and lower surface of leaves and other aerial green parts of the plant. In advance of the disease larger areas of the Aerial, parts are covered with these white floury patches and affected parts get shriveled and distorted. The disease usually appears late in the season. In severe infection, the



Symptoms of Powdery mildew

foliage becomes yellow causing premature defoliation and forced maturity.

#### Management:

- Deep ploughing should be done during May-June and follow crop rotation.
- Timely sowing and avoid late planting.
- Burn the crop debris.
- Spray wettable Sulphur @0.2%or Karathane @0.1%at the time of initiation of the disease.

### Downy Mildew

#### Causal organism - *Peronospora parasitica*

It is an obligate parasite and mycelium is hyaline, coenocytic which grows mainly intercellularly in the host tissues. Finger or clavate-shaped haustoria is formed by the intercellular mycelium. Sporangioophores are dichotomously branched the bear sterigmata which are long, cylindrical, and pointed at acute angles. Single sporangium born at the sterigmata which germinate by germ tube. and oospore produced by sexual reproduction.

**Symptoms:** The first symptoms appear on young leaves as purplish brown spots. The upper surface of the lesion is tan to yellow in color. Downy growth of the fungus is usually visible on the undersurface of these lesions. In systemic infection, the symptoms are very conspicuous almost similar to those produced by *Albugo candida* which also produces hypertrophy.

#### Management:

- ❖ Destruct crop debris.
- ❖ Use disease-free seed.
- ❖ Treat seed treatment with Apron 35SD @ 6g/kg seed.
- ❖ Spray the crop with Ridomil or Metalaxyl @0.25%.



Symptoms of Downy mildew