



## Major Diseases of Rapeseed-Mustard and their Management

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### Introduction:

Rapeseed-mustard is an annual herbaceous plant belonging to the family Brassicaceae or Cruciferae. It is a cool-season crop cultivated in the tropical and subtropical as well as in the temperate climates. In India, it is mainly cultivated in Rabi season from September-October to February-March. Indian mustard (*Brassica juncea*) is predominantly cultivated in the states of Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, Gujarat and West Bengal etc. India holds third position in rapeseed-mustard production in the world after China and Canada, with nearly 12% of the total production and occupies 1/5<sup>th</sup> of the global area under mustard. Despite being a significant oilseed edible crop that leads both in area and production, there is still a wide disparity between the potential yield and the yield obtained at the field level. This is attributed to the prevalence of various biotic and abiotic stresses. Among the biotic stresses, fungal diseases like *Alternaria* blight, White Rust, Downy mildew, Powdery mildew, *Sclerotinia* Stem Rot and club root have been

reported to be the most wide spread causing huge yield losses.

### Major Diseases of Mustard:

1) ***Alternaria* blight:** *Alternaria brassicae* and *A. brassicola*.

### Symptoms:

The disease are initially characterized by the formation of circular to irregular brown necrotic spots on the lower leaves surrounded by chlorotic haloes. The spots produced by *A. brassicae* are usually light grey compared to those huge black sooty velvety spots caused by *A. brassicola*. They appear as concentric rings that enlarge and cover the entire leaf resulting in blighting. Later infected plants also show circular to linear lesions on stems and siliquae.

### Management:

As it is both seed- and soil-borne disease, use disease-free and healthy seeds. Resistant varieties such as Pusa Kranti should be used. Crop rotation with non cruciferous crops. Weeds should be removed and destroy any crop residue. Seed treatment using carbendazim @2.5g or mancozeb @ 2g/kg and foliar spray with 0.25% Dithane M-45, Blitox

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50 etc. is found effective.

**Management:**



**Alternaria blight Symptoms**

**2) White Rust:** *Albugo candida* (A. cruciferum)

**Symptoms:**

Symptoms appear on all aerial parts as both local and systemic infections. Local infection results in isolated, white-creamy yellow raised pustules that appear on the lower side of leaves. These pustules then rupture and release chalky dust of spores (sporangia). They later coalesce to form patches. Systemic infection causes hypertrophy and hyperplasia resulting in malformation and distortion of floral parts/inflorescence commonly known as ‘Stag head’.

Use at least a three-year crop rotation with non-cruciferous crops. Use of resistant varieties. Early sowing of the crop (in the first week of October). Seed treatment with Metalaxyl (Apron 35 SD) @ 6 g/ kg. Spraying with Bordeaux mixture (8%), Ridomil MZ 72 WP @2 kg/ha or Dithane M-45 (0.2%).

**3) Downy Mildew:** *Peronospora parasitica*  
**Symptoms:**

Symptoms are shown by all the above-ground parts, but predominantly on leaves and inflorescence. On the under surface of leaves, irregular greyish-white necrotic patches are observed. Later, when conditions turn out to be



**White Rust Symptoms**

more favourable, brownish white fungal growth may also be seen on the spots. The corresponding upper surface shows tan to yellow colouration. The most obvious symptom is the formation of stag heads since the infection of the inflorescence results in the enlarged peduncle or inflorescence. The infected inflorescence does not produce any seeds or siliquae.

Its chemical management can involve treating seeds with Metalaxyl (Apron 35 SD) at a rate of 6g/kg, and then spraying with Metalaxyl (Ridomil MZ) @ 0.2%.

**4) Powdery Mildew: *Erysiphe cruciferarum*.**

**Symptoms:**

Symptoms appear initially on the lower leaves as small, scattered, circular, dirty-white, floury spots and later become a powdery



**Downy Mildew Symptoms**

**Management:**

The weed hosts of the pathogen should be eradicated. Avoid over-irrigation. Field sanitation (removal and destruction of the diseased leaves/shoots etc.) should be maintained. Deep ploughing in summer.

When fungus thrives well in the prevalent conditions, the entire leaves, stems and siliquae are affected. The affected siliquae produce small and shriveled seeds.

**Management:**



**Powdery Mildew Symptoms**

Removal of affected plant parts and cleaning up fallen plant debris. Properly regulate irrigation and fertilizer application. For chemical treatment, spray using wetttable Sulphur @ 0.2% or Dinocap @ 0.1% or Tridemorph @ 0.1%.

**5) *Sclerotinia* Stem Rot: *Sclerotinia sclerotiorum***

**Symptoms:**

The infected stems develop elongated, water-soaked lesions, particularly on their internodes or at the base which are later covered with whitish cottony growth of mycelium. Under severe situations, these areas show a bleached appearance and then defoliation, premature ripening, shredding of stems and wilting of plants occur. Infected stems split and expose hard black bodies, called sclerotia, which survive in the soil for years.

planting, maintaining field sanitation and following crop rotation for a few years and using chemicals for seed treatment (like carbendazim @0.1%) and its foliar spray also proves to be effective.

**6) Club Root: *Plasmodiophora brassicae***  
**Symptoms:**

Symptoms may be apparent at any growth stage of the plant. Initially, infected plants show yellowing of leaves followed by wilting and stunted growth. In later stages, plants show premature ripening. The characteristic symptom is observed in the root system when the plant is pulled up. Distorted masses of small or large irregular (spindle to spherical) club-shaped swellings appear. It may have a single massive gall or several galls (8-20) per plant. Later the roots decay and turn black. Gradually, the plant dies.

**Management:**



***Sclerotinia* Stem Rot Symptoms**

**Management:**

Follow better agricultural practices like using clean and healthy seeds, avoiding dense

Avoid growing the crop in already infected fields. Adopt a very long crop rotation with non-cruciferous crops. Avoid excess

irrigation and maintain better drainage facilities. Soil amendment using calcium compounds is recommended as spores do not germinate in high pH range (7.2-7.4). Use resistant varieties.



**Club Root Symptoms**

