

Major Diseases of Greengram and Their Management

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Introduction

Greengram (*Vigna radiata* L.), commonly known as mungbean is third most important pulse crop among thirteen food legume crops grown in India. Mungbean is a protein rich (24.5%) staple food with high quality of lysine (460 mg/g N) and tryptophan (60 mg/g N), 1.0 to 1.5 per cent oil, 3.5 to 4.5 per cent fibre, 4.5 to 5.5 per cent ash and 62.0 to 65.0 per cent carbohydrate on a dry weight basis (Singh *et al.*, 1970 and Tsou *et al.*, 1979). Sustainable mungbean production is continuously challenged by biotic stresses that take a heavy toll of the crop and diseases could cause an estimated yield loss of 21.93 to 68.77 % (Sharma *et al.*, 2008). Mungbean suffers from many diseases caused by fungi, bacteria, viruses, nematodes.

1. Anthracnose (*Colletotrichum lindemuthanium*)

Anthracnose is a major disease of greengram, It attacks all above ground parts of the plant. It does most serious damage on pods. Affected pods have brownish sunken spots, which under humid conditions are covered with a pink spore mass. Infected seeds become discoloured (brownish black). In severe infections, the affected parts wither off.

Survival and spread:

- The pathogens survive on seed and plant debris
- Disease spreads in the field through air-borne conidia

Favourable conditions:

- The disease is more severe in cool and wet seasons.

Control:

- Sowing certified disease-free seeds or Plant resistant varieties, where available
- Seed treatment with Carbendazim 2g/kg
- Practice crop rotation with non-legumes such as cereals

- Remove and destruct plant debris
- Spray Mancozeb 2g/lit or Carbendazim 0.5g/lit.

2. Powdery Mildew (*Erysiphe polygoni*)

White powdery patches appear on leaves and other green parts, which later become dull coloured. These patches gradually increase in size and become circular covering the lower surface. When the infection is severe, both the surfaces of the leaves are completely covered by whitish powdery growth. Severely affected parts get shrivelled and distorted. In severe infections, foliage becomes yellow causing premature defoliation. The disease also creates forced maturity of the infected plants which results in heavy yield losses. The fungal agent (pathogen) has a wide host range and survives on various hosts in off-season. It is spread by wind and water splash.

Survival and spread

- The pathogen has a wide host range and survives in various hosts in off -season
- Secondary spread is through air-borne conidia produced in the season.

Favourable conditions

- Cool (10-20 °C) and wet weather (90% RH) favours disease development.

Control

- Plant resistant varieties and remove weeds or Practice a good field sanitation
- Spray NSKE 5% or Neem oil 3% twice at 10 days interval from initial disease appearance.
- Spray Eucalyptus leaf extract 10% at initiation of the disease and 10 days later.
- Spray Carbendazim 500 g or wettable sulphur 1500g/ha or Propiconazole 500 ml/ha at initiation of the disease and 10 days later.

3. Rust (*Uromyces phaseoli*)

The disease appears as circular reddish brown pustules (blisters) which appear more commonly on the underside of the leaves, less abundant on pods and sparingly on stems. When leaves are severely infected, both the surfaces are fully covered by rust pustules. Shrivelling of pods is followed by defoliation resulting in yield losses. Long distance spread of rust is by wind. Plant to plant spread is by farm tools, and moving bodies within the crop.

Survival and spread

The pathogen survives in the soil or in crop debris. Primary infection is by the sporidia developed from teliospores. Secondary spread is by wind-borne uredospores.

Favourable conditions

- Cloudy humid weather, temperature of 21-26° C
- Nights with heavy dews

Control

- Plant resistant varieties, if available
- Avoid continuous cropping with legumes
- Practice crop rotation with non-legumes such as cereals
- Spray Mancozeb 1000g or wettable sulphur 1500g /ha at initiation of the disease and 10 days later.

4. Bacterial blight (bean blight) (*X. axonopodispv. phaseoli*)

Leaf spots first appear as small, water-soaked or light-green areas on leaflets. They later become dry and brown. The spots may join to affect much of leaf surface eventually killing the leaflet. Similar water-soaked spots develop on pods. The spot margin is a shade of red. Severely diseased pods shrivel. In humid weather, a yellowish crust of the blight bacteria covers the spot surface.

Survival and spread:

- The bacterium is seed-borne and through vines grows perennially.

Favourable conditions:

- Rain splashes play an important role in the development and spreading of the disease.
- Warm, rainy and wet weather.

Control

- Cultural practices are important in controlling bean blights. Eliminate weeds, volunteer beans and other potential hosts of bean blight, as this will reduce disease incidence.
- Good weed control will also improve aeration around the crop so that the plants dry faster, this will reduce the chances for bacterial spread and infection.

- The bacteria are readily spread by water and walking or working in the field while plants are wet will splash the bacteria and create wounds. Therefore avoid field operations when it is wet.
 - A rotation of at least 2 years between bean crops will give time for the bacteria population to decline in the debris.
 - Deep ploughing will also encourage the breakdown of infected plant debris.
- The incidence of bean blight can also be reduced if beans are grown with maize rather than in a monoculture.

5. Yellow mosaic virus

Initially mild scattered yellow spots appear on young leaves. The spots gradually increase in size and ultimately some leaves turn completely yellow. Infected leaves also show necrotic symptoms. Diseased plants are stunted, mature late and produce very few flowers and pods. Pods of infected plants are reduced in size and turn yellow in colour. The virus is transmitted by whiteflies (*Bemisia tabaci*).

Transmission and favourable conditions

- The disease is transmitted in semi persistent manner by aphid *Aphis gossypii*.
- Aphids are more active in warm summer conditions and increase in their population leads to increased spread of the viruses.

Control

- Growing resistant varieties such as VBN 4, VBN 6 and VBN 7
- Seed treatment with Dimethoate (or) Imidacloprid @ 5 ml /kg
- Installation of yellow sticky traps 12 nos/ha
- Rogue out the infected plants up to 45 days
- Foliar spray of notch leaf extract 10% at 30 DAS or neem formulation 3 ml/lit
- Spray methyl demeton 25 EC 500 ml/ha or dimethoate 30 EC 500 ml/ha or thiamethoxam 75 WS 1g /3 lit for control of white flies and repeat after 15 days, if necessary.

References

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