



Disease Management of Green Gram

(*Jyoti Jhirwal)

Department of Plant Pathology, College of Agriculture, Jodhpur (Rajasthan)

*Corresponding Author's email: jyotijhirwal9521@gmail.com

Abstract

Green gram, a valuable legume crop, is susceptible to a range of diseases that can undermine its yield and quality. This abstract underscores the significance of understanding these challenges and implementing effective management practices. In terms of diseases, green gram can be afflicted by ailments like powdery mildew, blight, root rot, anthracnose, leaf spot, rust, dry root rot, mungbean yellow mosaic disease, leaf crinkle disease, leaf curl, ascochyta leaf spot and bacterial blight. These diseases lead to a variety of symptoms, including leaf discoloration, blemishes, and reduced overall plant vigor. The abstract also acknowledges the economic implications of these diseases, highlighting symptoms and control of these diseases for good yields.

Introduction

Pulses occupy 68.32 million ha area and contribute 57.51 million tonnes to the world food production. India is the largest producer of pulses in the world, with 24% share in world production. Green gram (*Vigna radiata* L.), is one of the important pulse crop in India. Because of its high nutrient content, it is regarded as green pearl and is commonly known as Mung bean, Chickasono pea, Moong, Chiroko, Oregon pea, Chickasaw pea, and Golden gram. It increases the fertility of the soil, by addition of nitrogen to the soil. It is a short duration crop (60-65 days), making it fit in mixed cropping systems and crop rotation.

In India, the green gram is cultivated in Kharif, Rabi, and summer seasons. During 2017- 2018, the total yield of green gram in India was 19 lakh tonnes from 41 lakh hectares area with a yield level of 467 Kg/ha. The highest production was reported at Rajasthan (39.06%), followed by Madhya Pradesh (11.57%), Green gram is India's fourth-highest produced pulse crop (19 lakh tons) after gram, tur, and urd.

Green gram contains about protein (24%), fat (1.15%), carbohydrate (56 -63%), minerals and vitamins. Presently, the per capita share of pulses in nutrition supply in India with respect to energy, protein and fat is 117.4 K cal, 6.9 gm and 1.0 gm per day respectively. An adult male and female requires 80 and 70 gm per capita per day, respectively for balanced diet.

It is consumed in different forms such as vegetables, sprouts, dal, processed grain, fried bean, bean paste or incorporated into noodles, bread, cakes, cold jellies, and desserts (Nair et al., 2013) and possess medicinal properties and are used to treat conditions like edema, diarrhea, headaches, and eye problems.

Green gram suffers from many diseases caused by fungi, bacteria, viruses, nematodes and also abiotic stresses. In green gram, considerable losses in the production occur as a result of powdery mildew (*Erysiphe polygoni*), anthracnose (*Colletotrichum lindemuthianum*), bacterial blight (*Xanthomonas phaseoli*), rust (*Uromyces appendiculatus*), leaf crinkle and yellow mosaic virus.

Major diseases of Green Gram

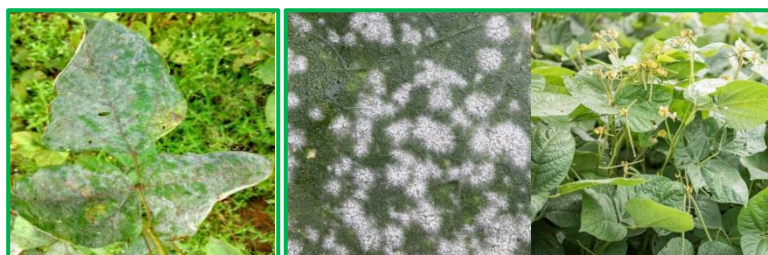
1. Powdery mildew - *Erysiphe polygoni*

Symptoms: Small, irregular powdery spots appear on the upper surface of the leaves, sometimes on both the surfaces. The disease becomes severe during flowering and pod development stage. The white powdery spots completely cover the leaves, petioles, stem and even the pods. The plant assumes greyish white appearance; leaves turn yellow and finally shed. Often pods are malformed and small with few ill-filled seeds.

Disease cycle: The Pathogen is an obligate parasite and survives as cleistothecia in the infected plant debris. Primary infection is usually from ascospores from perennating cleistothecia. The secondary spread is carried out by the air-borne conidia. Rain splash also helps in the spread of the disease.

Management

- Remove and destroy infected plant debris.
- Spray Carbendazim 500g or Wettable sulphur 2 kg or Tridemorph 500 ml/ha at the initiation of disease and repeat 15 days later



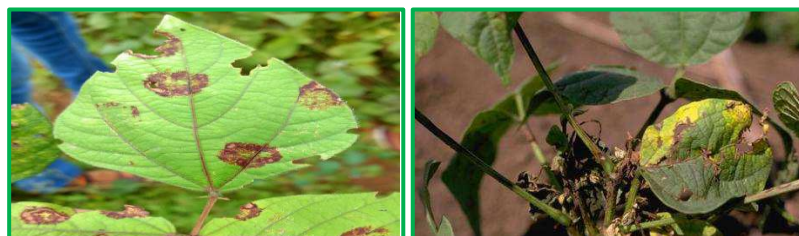
2. Anthracnose - *Colletotrichum lindemuthianum*

Symptoms: Any stage of plant growth and all aerial components are affected by the disease. On leaves and pods, there are round, black, sunken dots with a dark centre and a brilliant red or orange edge. When an infection is severe, the afflicted areas deteriorate. Soon after seed germination, infection causes seedlings to become blighted.

Disease cycle: The fungus is seed-borne and cause primary infection. It also lives in the infected plant tissues in soil. The secondary spread by air borne conidia produced on infected plant parts. Rain splash also helps in dissemination.

Management

- Remove and destroy infected plant debris in soil.
- Treat the seeds with Carbendazim at 2 g/kg.
- Spray Carbendazim 500g or Mancozeb 2kg/ha as soon after the appearance of disease and repeat after 15 days
- Hot water treatment at 54° for 10 minutes.



3. Leaf spot - *Cercospora canescens*

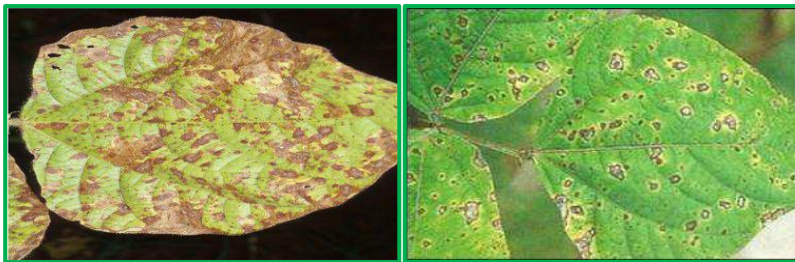
Symptoms: Small, circular spots develop on the leaves with grey centre and brown margin. Several spots coalesce to form brown irregular lesions. In severe cases defoliation occurs. The brown lesions may be seen on petioles and stem in severe cases. Powdery growth of the fungus may be seen on the centre of the spots.

Disease cycle: The fungus survives on diseased plant debris and on seeds. The secondary spread is by air-borne conidia.

Management

- Remove and burn infected plant debris.
- Spray Mancozeb at 2 kg/ha or Carbendazim at 500 g/ha.
- Plant moong among tall-growing grains and millets.

- Practice clean cultivation.
- Plant disease-free seed.
- Keep crop population density low and row spacing wide.
- Cassava, garlic, and zinger crude extracts are used to effectively control the sickness.
- Mulching minimises disease incidence and thereby increases yield.



4. Rust - *Uromyces phaseoli*

Symptoms: Numerous spots with pale brown centre and reddish brown margin on leaves, branches and pods. Defoliation during flower and pod formation

Disease cycle: In soil as teliospores and on crop debris as uredospores. The fungus also survives on other legume hosts (beans, cowpea, etc.). Primary spread: Sporidia. Secondary spread: Wind -borne uredospores

Management

- Spray Mancozeb 72 WP @ 1000g/ha or Wettable sulphur 80 WP @ 1500g/ha or Chlorothalonil 75% WP@ 1000 g/ha or Captan 70% +Hexaconazole 5% WP @ 750ml/ha or Sulphur 85% DP @ 15-20 kg/ha at initiation of disease. If necessary, repeat the spray 15 days later.
- Remove the infected plant debris and destroy.



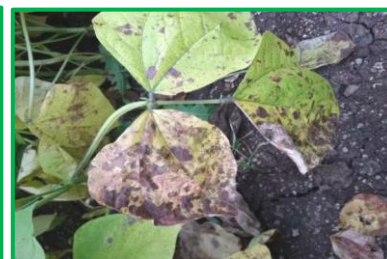
5. Dry root rot- *Rhizoctonia bataticola* (Pycnidial stage: *Macrophomina phaseolina*)

Symptoms: The disease symptom starts initially with yellowing and drooping of the leaves. The leaves later fall off and the plant dies within week. Dark brown lesions are seen on the stem at ground level and bark shows shredding symptom. The affected plants can be easily pulled out leaving dried, rotten root portions in the ground. The rotten tissues of stem and root contain a large number of black minute sclerotia.

Disease cycle: The fungus survives in the infected debris and also as facultative parasite in soil. The primary spread is through seed-borne and soil-borne sclerotia. The secondary spreads is through pycnidiospores which are air-borne.

Management

- Treat the seeds with carbendazim + thiram at 2 g/kg (1:1 ratio) or pellet the seeds with *Trichoderma viride* at 4 g/kg (106cfu/g) or *Pseudonomas fluorescens* @ (106cfu/g) of seed.
- Basal application of zinc sulphate @ 25 kg/ha or neem cake @ 150 kg/ha.
- Soil application of *T. asperellum* – 2.5 kg / ha + 250 kg of well decomposed FYM at 30 days after sowing.
- Spot drenching with Carbendazim 50 WP @ 1 gm/ lit.



6. Mungbean yellow mosaic disease - *Mungbean yellow mosaic virus* (MYMV)

Symptoms: Initially small yellow patches or spots appear on green lamina of young leaves. Soon it develops into a characteristic bright yellow mosaic or golden yellow mosaic symptom. Yellow discoloration slowly increases and leaves turn completely yellow. Infected plants mature later and bear few flowers and pods. The pods are small and distorted. Early infection causes death of the plant before seed set.

Disease cycle: Transmitted by whitefly, *Bemisia tabaci* under favourable conditions. Disease spreads by feeding of plants by viruliferous whiteflies. Summer sown crops are highly susceptible. Weed hosts viz., *Croton sparsiflorus*, *Acalypha indica*, *Eclipta alba* and other legume hosts serve as reservoir for inoculum.

Management

- Rogue out the diseased plants up to 40 days after sowing.
- Remove the weed hosts periodically.
- Seed soaking with borax @ 2g/kg +10% nochi leaf extract @ 300 ml/kg for 30 minutes followed by seed treatment with imidacloprid 600 FS @ 5 ml / kg of seed
- Spray Thiamethoxam-25WG @ 100g or Imidacloprid 17.8% SL @ 100 ml in 500 lit of water.



References

1. Diseases of field crops and their management, TNAU, Tamilnadu.
2. Khaire, P. and Hake, L. (2019). Disease management of kharif green gram and black gram. *Popular Kheti*, 6(2): 96-103.
3. Mekkara N.S.S. and Bukkan, D.S. (2021). A review on nutritional composition, antinutritional components and health benefits of green gram (*Vigna radiata* (L.) Wilczek). *Journal of food biochemistry*. 45 : 6.
4. Srivastava, J.N., and Singh, A.K. (2020). Diseases of field crops diagnosis and management: Volume 2: Pulses, Oil Seeds, Narcotics, and Sugar Crops (1st ed.). Apple Academic Press.