

Major diseases of chickpea and their management

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Introduction:

chickpea The (Cicer arietinum), sometimes referred to as gram or Bengal gram, is a significant cool-season legume crop that is extensively grown for its high nutritional content, especially as a rich source of fiber, protein, vitamins, and minerals. Because of its capacity to fix atmospheric nitrogen and increase soil fertility, it is a mainstay in many vegetarian diets and is essential to sustainable agriculture. A staple crop in nations like India, Pakistan, Turkey, and Australia, chickpeas are mainly cultivated in semi-arid areas and are ideal for dryland farming. The crop is utilized in many different culinary dishes around the world and comes in two primary varieties: desi (small, darker seeds) and kabuli (big, lighter seeds). However, it is prone to several diseases that can cause significant yield losses. Here are some major important diseases in chickpea:

1. Ascochyta Blight (Ascochyta rabiei)

Ascochyta Blight is a devastating disease that mostly affects chickpea plants and is brought on by the fungus *Ascochyta rabiei*.

On leaves, stems, and pods, it appears as dark brown lesions that frequently have tiny black pycnidia (fruiting bodies) at their centers in concentric rings. The disease can spread quickly in favorable conditions, such as cool, rainy weather, resulting in defoliation, broken stems, and, in extreme situations, total plant death and drying. Infected seeds, crop debris, and rain splash are the main ways that the disease spreads, and if left unchecked, it can seriously reduce crop productivity.

Management:

Use resistant varieties (e.g., ICCV 05530, ICCV 10305).

• Seed treatment with fungicides like Thiram or Captan (2.5 g/kg seed).

- Foliar spray with fungicides like Mancozeb or Chlorothalonil at early symptom appearance.
 - Crop rotation with non-host crops (e.g., cereals).
 - Remove and destroy crop residues.
- 2. Fusarium Wilt (Fusarium oxysporum f. sp. ciceris)

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Fusarium Wilt, caused by *Fusarium* oxysporum f. sp. ciceris, is a soil-borne fungal disease that severely affects chickpea crops. A crucial diagnostic characteristic of infected plants is the browning of the vascular tissues in the roots and stems, which frequently follows the yellowing and drooping of the leaves. Water and nutrient flow are obstructed as the disease worsens, causing the plants to wilt and eventually die; this usually happens in asymmetrical areas of the field. Crop rotation and management are essential for controlling this disease because it can linger in the soil for many years.

Management:

- Grow resistant varieties (e.g., JG 62, WR 315).
- Use disease-free seed.
- Treat seed with fungicides or Trichoderma viride.
- Deep summer ploughing to expose fungal spores.
- Practice crop rotation for 3-4 years.

3. Botrytis Gray Mold (Botrytis cinerea)

Botrytis Gray Mold, caused by *Botrytis cinerea*, is a fungal disease that affects a wide range of plants, including chickpeas, especially under cool, humid conditions. On stems, leaves, and flowers, it is typified by the formation of gray, fuzzy mold, which frequently starts as water-soaked lesions that quickly spread. Tissues soften and decompose as the infection worsens, which finally causes the plant to collapse and die. Because the illness spreads readily through airborne spores, protection requires proper field hygiene and moisture management.

Management:

- Avoid dense sowing to improve air circulation.
- Apply fungicides like Iprodione or Carbendazim.
- Remove infected plant debris.
- Grow tolerant varieties if available.

4. Collar Rot (Sclerotium rolfsii)

Collar Rot, caused by *Sclerotium rolfsii*, is a fungal disease that primarily affects seedlings, leading to their sudden wilting and death. Brown lesions that frequently encircle the stem form in the collar region, which is slightly above the soil line and is where the infection first appears. The presence of tiny, mustard-like sclerotia and white, cottony mycelium at the base of the plant are important diagnostic characteristics. Because it can linger in the soil and flourishes in warm, humid environments, this disease is a recurring issue in fields that are impacted.

Management:

- Seed treatment with fungicide (Carbendazim or Trichoderma).
- Avoid waterlogging.
- Follow proper spacing to reduce humidity near soil.

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Crop rotation with non-host crops.

5. Dry Root Rot (*Rhizoctonia bataticola*)

Dry Root Rot, caused by Rhizoctonia bataticola, is a fungal disease that affects mature chickpea plants, leading to sudden wilting without prior yellowing. Without any indications of oozing or wet decomposition, the roots exhibit dry rot, turning black, brittle, and withered. Because of their weaker root systems, affected plants frequently break readily at the base. The disease usually manifests in hot, dry weather, particularly when plants are under stress from drought or unhealthy soil.

Management:

- Use tolerant/resistant varieties.
- Ensure adequate soil moisture (drought) stress favors disease).

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- Seed treatment with fungicides biocontrol agents. AGRICULTUR
- Practice good field sanitation.

6. Rust (Uromyces ciceris-arietini)

Rust, caused by Uromyces cicerisarietini, is a fungal disease that typically affects chickpeas in the late season. It is recognized by the presence of orange to brown pustules on the underside of the leaves, which aid in the disease's spread by releasing spores. Reduced photosynthesis and possible yield loss result from the infection's progression, which causes leaves to turn yellow, dry out, and fall off too soon. Warm, humid weather is ideal for rust growth, and resistant cultivars and prompt fungicide administration are key components of good management.

Management:

- Early sowing to escape peak rust period.
- Spray with fungicides like Mancozeb or Propiconazole.
- Use resistant/tolerant varieties.



When growing chickpeas, pre-sowing treatment is crucial for encouraging healthy germination, early seedling vigor, and defense against pests and diseases. Cleaning to get rid of trash and damaged seeds comes after choosing certified, disease-free seeds with a good germination potential. Ascochyta blight and Fusarium wilt can be prevented using fungicide treatment that uses carbendazim, treiam, or both. Biological treatments with Trichoderma species further control root and collar rot while promoting plant health. Inoculation with Rhizobium ciceri enhances nitrogen fixation, and Phosphate Solubilizing Bacteria (PSB) improves phosphorus

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availability; both are applied after fungicide and bio-agent treatments. Nitrogen metabolism is supported by sodium molybdate treatment of micronutrients. It is advised to treat with a fungicide first, then bio-control agents 24 hours later, followed by Rhizobium and PSB. Seeds should be dried in the shade and sowed as soon as possible.

