FINGER MILLET DISEASES

Most finger millet diseases are caused by fungi but a few may be caused by bacteria and viral pathogens.

1. Finger millet blast disease.

- Foliar/leaf blast
- Stem/Neck blast
- Finger/heaf blast
- Severe blast on a finger millet
This is caused by the fungus Pyricularia grisea. It is by far the most important finger millet disease that can cause yield losses ranging from 20 - 95% depending on environment, variety used, and management applied.

The disease affects the crop at all stages from seedling to grain formation.

**Symptoms of the disease on leaves are:**

- Elliptical or diamond shaped lesions whose centers are grey.
- Appears water-soaked
- Surrounded by a chlorotic halo with concentric rings.

Maximum damage is caused by neck infection which is part of stem infection manifested through blackening of the part that may lead to rotting and breaking off. Olive grey fungal growth is also seen on the affected area. In later stages, panicle infection sets in.

The infection usually begins from the apical portions of a finger or fingers and extends towards the base. The infected ears become chaffy and only a few withered grains may be found and eventually turn black.

**Management** by spraying with fungicides may be effective but not cost effective, especially to resource poor farmers.

Planting resistant varieties is the most cost effective control method.

2. **Wilt or Foot Rot**

![Finger millet wilt or root rot](image_url)

This is caused by a soil borne fungus Sclerotium rolfsii. The disease can cause up to 50% yield loss. Infection occurs just above the ground in collar region that initially appears water soaked
and later turns brown as the stem shrinks in the affected portion with growth of white fungal tissue that later turns brown. Plant leaves wither, droop and dry, killing the plant.

3. **Cercospora Leaf Spot**

![Cercospora leaf spot on finger millet](image)

The disease is caused by the fungus *Cercospora eleusine*. It is common in mid to high altitude (850 >1900m altitude) areas with high rainfall and low temperatures. It can cause up to 40% yield loss.

**Symptoms are:**

- Small oval, oblong to rectangular dark lesions on leaves.
- The centers of the lesions are gray to tan in color with visible black dots and may be covered in spores during wet weather.
- The lesions may also be on stems and are slightly longer than those on the leaves.

**Chemical control** is possible by use of fungicides such as Ransom 600WP 15g/20l or Ducasse 250EC 20ml/20l or Jupiter 125SC 15ml/20l

4. **Downy Mildew or Green Ear Disease**
The disease is caused by the fungus Sclerophthora macrospora. Infected plants develop thick, stiff, twisted, pale green leaves with bumpy surfaces and do not yield but turn into a tuft of leafy structures displaying the typical green ear symptom. It is seed borne and hence seed treatment could be required. Chemical control is possible by spraying fungicides like Gearlock Turbo 250WP 25g/20l, Fortress Gold 720WP 40g/20l or Tower 720WP 50g/20l.

v. Finger millet Smut
The disease is caused by the fungus Melanopsichium eleusinis. The disease occurs after flowering and smutted grains are scattered randomly in the panicle as greenish galls that are several times bigger than grain. They turn black on drying.

vi Damping Off
Infection causes rotting of seeds before they emerge as well as seedlings after emergence from the soil. It occurs in poorly drained fields, especially during rainy seasons. The infected patch in the field turns yellowish to dark brown and finally seedlings die. Fungicides like copper oxychloride, Captan, Thiram or Metalaxyl can help reduce the problem.

Nutrition & Nutritional Deficiencies
For optimal yield, finger millet crop needs enough nutrient supply in form of fertilizers. The amount of fertilizer to be applied depends on the fertility of the soil. It is, therefore, important
to do soil analysis of the land intended for finger millet cultivation so that one knows the amounts and types of fertilizer to apply. Application can be in basal, top dress, or foliar. Under supply of nutrients to a finger millet crop will lead to nutrient deficiency symptoms that may express as below:

(a) **Nitrogen deficiency**

Reduced growth rate; leaves turn yellow, starting with the older ones; and stunting.

(b) **Phosphorous deficiency**

Dark green plant colour; stunted growth; reddish purple leaf discoloration starting with the older to the young leaves.

(c) **Potassium deficiency**

Marginal leaf chlorosis, followed by necrosis starting with the older ones to the young ones; stunted growth in severe deficiency.

(d) **Zinc deficiency**

Broad yellow bands on leaves that later turn pale brown or grey. Symptoms start with young leaves and progress towards the older ones. Unlike other deficiencies, symptoms start with younger leaves and progress to older ones.

**Integrated Pest and Disease Management in Finger Millet**

There are a number of methods in pest and disease control. Practiced wholly or in partial combinations, they form the Integrated Pest and Disease Management (IPDM). These methods are:

**Cultural Method of Control includes:**

a) **Sanitation:** Field sanitation, and uprooting and burning of stubbles help to reduce the carryover of stem borers.

b) **Tillage:** Field tillage before planting and after the crop harvest helps to expose the hibernating/aestivating/hiding larvae and pupae of many insect species. Deep ploughing is particularly helpful in reducing the populations of grasshoppers, and hairy caterpillars.
c) Intercropping: Finger millet with different species interferes pest and disease pathogen identification and infestation of host plants. The intercrop may also create unfavourable environment for the pest or pathogen e.g. intercropping of legumes with finger millet to reduce Striga infestation. Intercrop may also harbour natural enemies of the pest or pathogen.

d) Weed Control: Proper and timely weeding of the crop can reduce pest or disease pressure.

Mechanical Method:

e) Mechanical Collection and Destruction: e.g. Egg masses of hairy caterpillars and other lepidopteran pests can be hand collected and destroyed and aphid infested plants can be uprooted and destroyed.

Physical Method:

(a) Setting up of light traps helps in attracting and killing the stem borers and other moth pests

Host Plant Resistance (HPR) Sources:

Host plant resistance exists for both pests and diseases. This tends to be the most cost effective method, especially for the resource poor finger millet farmers.

Chemical Control:

This involves use of contact, gut, or systemic chemicals in the control of pests and diseases. There are several such chemicals in the market.

Biological Control

This is where natural enemies of the pest or pathogen are deployed to control or eliminate the pest or pathogen from the host.