

## SYMPTOMS AND SIGNS OF PLANT DISEASES

**Aim:** To acquaint the students with symptoms and signs of plant diseases

### Symptoms and signs

**Symptoms** -External expression or the evidence of the abnormalities in the appearance of the diseased plants brought about by the pathogens after host-pathogen interaction.

**Sign-** When the pathogen itself becomes visible on the host surface in the form of its organs or structures. eg. sclerotia, mycelium etc.

**Disease syndrome-** A sum total of variety of symptoms produced by the disease.

### I. Symptoms of Plant Diseases Due to the Character and Appearance of Visible Pathogen, its Structures and Organs

#### i. Mildews

- Mildews consist of white, grey, brownish or purplish pathogen growth on the host surface.
- **Downy mildew** is characterized by a tangled cottony or downy growth mostly on the lower surface of the leaves or other plant parts.
- **Powdery mildew** consists enormous number of spores are formed on superficial growth of the fungus giving a dusty or powdery appearance on the host surface. Black minute fruiting bodies may also develop in the powdery mass.



**Grapevine downy mildew**



**Pea powdery mildew**

#### ii. Rust

- Rust appears as relatively small pustules of the spores, usually breaking through the host epidermis.

- Pustule is a small blister-like elevation of the epidermis, often opening to expose spores. The pustules may be dusty or compact, and red, brown, yellow or black in colour.



**Pea rust**

**iii. Smut**

- Smut means a sooty or charcoal like powder.
- The affected parts of the plants show black or purplish black dusty areas.
- Symptoms usually appear on floral organs, particularly the ovulary areas.
- The pustules on the leaves and stems are usually larger than those of rusts.

**iv. White Blister**

- White blister-like pustules appear on the leaves and other parts of cruciferous plants



which break open the epidermis and expose powdery masses of spores.

- Such symptoms are called ‘white rust’, although there is nothing common with them and the rusts.

**White blisters on a crucifer**

**v. Blotch**

- It consists of superficial growth giving the affected plant parts i.e., fruits and leaves smoky (blotched) appearance, e.g. sooty blotch of apple.



**Sooty blotch of apple**

**vi. Sclerotia**

- A sclerotium is a compact, often hard mass of dormant fungus mycelium.
- Sclerotia are mostly dark in colour and are found mixed with the healthy grains as in the case of ergot of wheat and rye.

**vii. Exudation**

- Mass of bacterial cells ooze out on the surface of the affected organs where they may be seen as a drop or smear in several bacterial diseases such as bacterial blight of paddy, gummosis of stone fruits and fire blight of apple and pear.
- They form crusts after drying.

**viii. Mycelial growth**

- Appearance of white cottony, mycelial growth of the fungi like *Dematophora necatrix* on affected roots of apple is an important diagnostic feature of white root rot in the field.



*Sclerotium rolfii* sclerotia



White root rot of apple



Mango gummosis

## II. Symptoms Resulting from Internal Disorders in the Host Plants

### i. Colour change

- **Discolouration** is change of colour from normal. It is one of the most common symptoms of plant diseases. The green pigment of leaves disappears entirely and is replaced by yellow pigments.
- **Etiolation** is yellowing due to the lack of light.
- **Chlorosis** is yellowing due to low temperature, lack of iron, excess of the lime or alkali in soil and infection by viruses, fungi and bacteria.
- **Albinism** is the phenomenon in which the leaves become devoid of any pigment and look bleached or white.



Mosaic symptoms on a cucurbit leaf

- **Chromosis** is change of colour to red, purple or orange.

**ii. Overgrowths or hypertrophy**

- **Hypertrophy** is the abnormal increase in the size of the plant organs due to increase in the size of the cells of a particular tissue, whereas
- **Hyperplasia** is the abnormal increase in the size of the plant organs due to increase in the number of cells of which the tissue or organ is composed, owing to increased cell division.

The overgrowths cause galls, curl, pockets or bladders, hairy root, witches' broom, intumescence etc.



**Crown gall of peach**

**iii. Atrophy or Hypoplasia or Dwarfing**

- Atrophy is inhibition of growth and thereby showing stunting and dwarfing effect on the plants.
- The whole plant may be dwarfed or only certain organs are affected. e.g. rice dwarf, phony peach etc.

**III. Necrosis**

- Death of the cells, tissues and organs occurs as a result of parasitic activity.
- The characteristic appearance of the dead areas differs with different hosts, host organs and with different parasites.
- Necrotic symptoms include spots, streaks or stripes, canker, blight, damping off, burn, scald or scorch and rot.





**Colocasia blight**



**Brown rot of pear**

#### **IV. Wilt**

- Characterized by drying of the entire plant.
- Leaves and other green or succulent parts lose their turgidity, become flaccid and droop down.
- Usually seen first in some of the leaves.
- Later, the young growing tip or the whole plant may dry up.
- May be caused by injury to the host system or the conducting vessels.
- Wilting due to disease is different from the physiological wilting where the plant recovers as soon as the supply of water is retained.



**Fusarium wilt of pea**



**Bacterial wilt of capsicum**

#### **V. Die-back or Wither Tip**

- Symptoms are characterized by drying of plant organs, especially stems or branches, from the tip backwards.
- It is also a form of necrosis caused directly by the pathogen or its toxins.



**Die-back symptom on mango**