

Introduction to plant pathogens

Plant Diseases

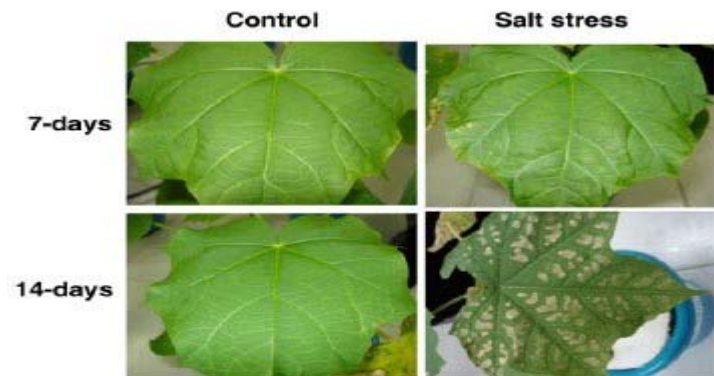
- Anything that prevents a plant from performing to its maximum potential is called a plant disease. The cause may be an abiotic factor or a biotic factor.

Abiotic or non-infectious diseases

These diseases are caused by conditions external to the plant, not living agents. They cannot spread from plant to plant, but are very common and should be considered when assessing the health of any plant. Examples of abiotic diseases include nutritional deficiencies, soil compaction, salt injury, ice, and sun scorch.



Zn deficiency in pea



NaCl stress in Jatropha

Biotic or infectious diseases

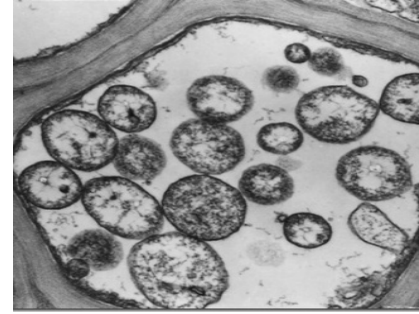
These diseases are caused by living organisms. They are called plant pathogens when they infect plants. Pathogens can spread from plant to plant and may infect all types of plant tissue including leaves, shoots, stems, crowns, roots, tubers, fruit, seeds, and vascular tissues.

What are plant pathogens?

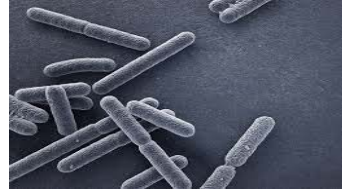
- 'Plant pathogen' is a broad term that refers to any of the organisms, such as Fungi and Fungal-like Organisms (FLOs); Bacteria; Phytoplasmas; Viruses and viroids; Nematodes and Parasitic higher plants that cause plant diseases.
- Plant pathogens are of interest for a number of reasons, as they can make an ecosystem fragile and increase demand to protect food supply.
- Plant pathogens that cause plant diseases reduce a grower's ability to produce crops and can infect almost all types of plants.



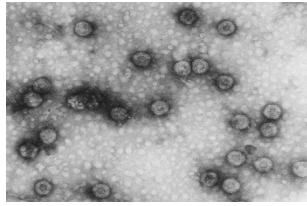
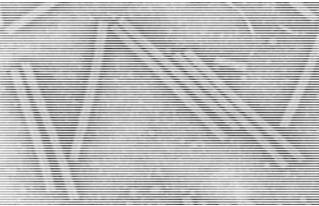
Fungi



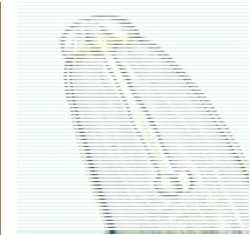
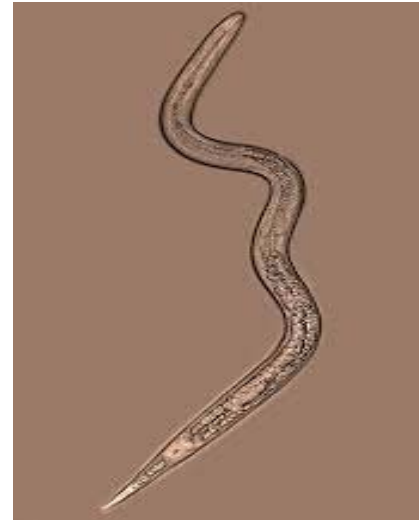
Phytoplasma



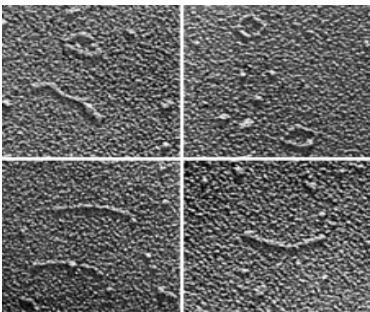
Bacteria



Virus



Nematode



Viroids



Loranthus

**Stem
parasites**



Cuscuta/Dodder



Striga

**Root
parasites**



Orobanche

Plant pathogen symptoms

- Plants are attacked by different groups of pathogens individually or sometimes by more than one pathogen-producing complex and more severe disease.
- The type of external symptoms can, in most cases, indicate the nature of the pathogen responsible for the disease.
- Plant pathogens can attack in a number of different ways. Some colonize the tissue in the plant, others settle on the surface of the plant, and others may go for specific areas such as the roots, stems, and leaves.
- Pathogens commonly cause problems like tissue death, browning, a decrease in fruiting, problems with setting flowers, and so forth. In extreme cases, they can kill the host plant.

Examples of common signs and symptoms of fungal, bacterial and viral plant diseases:

Fungal disease symptoms

Birds-eye spot on berries
(anthracnose)
Damping off of seedlings
(phytophthora)
Leaf spot (septoria brown spot)
Chlorosis (yellowing of leaves)

Bacterial disease symptoms

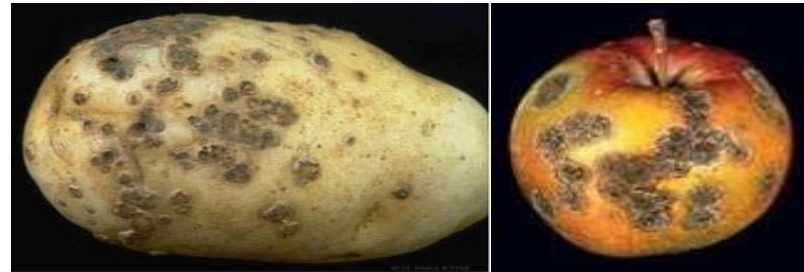
Leaf spot with yellow halo
Fruit spot
Canker
Crown gall

Viral disease symptoms

Mosaic leaf pattern
Crinkled leaves
Yellowed leaves
Plant stunting



Leaf spot



Scab



Blight



Mosaic



Galls



Wilt



Grassy shoot