

Plant Pathology Services Section Front Page

Phytopathology (Phyton : plant) Greek - Pathos (suffering) + Logos (study) = The study of the suffering plant

Plant pathology is that branch of agricultural, botanical or biological sciences which deals with the study of:

1. Cause of the disease
2. Resulting losses and
3. Control of plant diseases

Objectives of Plant pathology

1. Study of origin, causes or reasons. Study of living, non-living and other causes of disease or disorder in plants- Etiology
2. Study of mechanism of disease development i.e. processes of infection and colonization of the host by the pathogen. This phase involves complex host-pathogen interactions- Pathogenesis
3. Study the interaction between the causal agent and the diseased plants in relation to environmental conditions. Generally at the population level- Epidemiology
4. Development of management systems of the diseases and reduction of losses caused by them- Control/ Management.

Plant pathology is both science (of Learning and understanding the nature of disease) and Art (of diagnosing and controlling the disease)

Disease

1. the process in which a pathogen interferes with one or more essential plant cell functions
2. Marshall Ward (1901): disease represents a condition in which functions of the plant are not properly discharged.
3. Disease is a harmful deviation from normal functioning of physiological processes. (British Mycological Society, 1950)
4. Horsfall & Diamond (1957): Disease can be defined as a physiological disorder or structural abnormality that is deleterious or harmful to the plant or its part or product that reduces its economic value.
5. Disease can be defined as the result of interaction between host, pathogen and environment

How Pathogens affect Plants

There are many ways in which plant disease pathogens can affect plants

1. By utilizing host cell contents
2. By killing host or by interfering with its metabolic processes through their enzymes, toxins etc.
3. By weakening the host due to continuous loss of the nutrients.
4. By interfering with the translocation of the food, minerals and water.
5. They can suppress the chlorophyll content.
6. They can reduce the leaf area.
7. They can curb the movement of solutes and water through the stems.
8. They sometimes reduce the water-absorbing capacity of the roots.
9. They suppress the translocation of photosynthates away from the leaves.
10. They sometimes promote wasteful use of the products of photosynthesis as in the formation of galls.

Similarly, advances were also made in the diagnostic and detection techniques helping in accurate and quick detection and identification of the pathogens.

1. ELISA
2. Monoclonal antibodies
3. DNA probes
4. PCR based methods
5. RFLP
6. RT-PCR
7. IC/RT-PCR

In management of diseases

1. Cp mediated resistance
2. SAR
3. Gene silencing