

## Semester-II

### Core Course III: Mycology and Phytopathology

Course Code: BOTACOR03T

#### Unit 9: Phytopathology

##### Terms and concepts

Plant Disease: A physiological disorder or structural abnormality that is harmful to the plant or only its parts or products that reduced the economic value.

Disorder: Non-infectious plant diseases due to abiotic causes such as adverse soil and environmental conditions are termed disorders.

Disease Incidence : the number of plants affected by a disease within a population. E.g. soil borne diseases, nematodes

Disease Severity : the measure of damage done by a disease. OR Amount of disease present in a population. E.g. Leaf, stem, seed diseases

Hypha (pl. Hyphae) : a single tubular thread-like filament of a fungal mycelium. The hypha is the basic structural unit of a fungus.

Mycelium (pl. Mycelia) : a mass of hyphae that forms the body (thallus) of a fungus. Mycellium

Spore: a specialized reproductive body in fungi (and some other organisms), containing one or more cells, capable of developing into an adult.

Biotroph: an organism that can live and reproduce only on another living organism. A biotroph is completely dependent on the host organism as a source of nutrients, i.e. it is an obligate parasite.

Necrotroph : an organism (parasite) that causes the death of host tissues as it grows through them, obtaining its energy from the dead cells.

Saprophyte : an organism that obtains nourishment from non-living organic matter (usually dead and decaying plant or animal matter) by absorbing soluble organic compounds.

Pathogenicity: The capacity of a pathogen to cause disease.

Pathogenesis : is the chain of events that lead to development of disease in the host (or) sequence of progress in disease development from the initial contact between the pathogen and its host to the completion of the syndrome.

Sign: The pathogen or its parts or products seen on a host plant.

Symptom: The external or internal reactions or alterations of a plant as a result of a disease.

Syndrome: The set of varying symptoms characterizing a disease are collectively called a syndrome.

OR

The series of symptoms of a disease collectively known as syndrome.

Virulence: The degree of pathogenicity of a given pathogen.

Virulent: Capable of causing a severe disease; strongly pathogenic.

Avirulent (non-virulent): Non-pathogenic or lacking virulence.

Infection: The establishment of a parasite within a host plant.

Latent Infection : where the host is infected with a pathogen but does not show any symptoms.

Infectious disease: A disease that is caused by a pathogen which can spread or transfer from a diseased to a healthy plant.

Non-infectious disease: A disease that is caused by an abiotic agent, that is, by an environmental factor, not by a pathogen.

Inoculum: The pathogen or its parts that can cause infection. That portion of individual pathogens that are brought into contact with the host.

Inoculum potential: Which consists of the number of propagules and their capacity to cause infection.

Inoculate: To bring a pathogen into contact with a host plant or plant organ.

Inoculation: The arrival or transfer of a pathogen onto a host.

Isolation: The separation of a pathogen from its host and its culture on a nutrient medium.

Isolate: A single spore or culture and the subcultures derived from it. Microscopic: Very small; can be seen only with the aid/use of a microscope. Penetration: The initial invasion of a host by a pathogen. Primary infection: The first infection of a plant by the overwintering or oversummering pathogen. Primary inoculum: The overwintering or oversummering pathogen, or its spores that cause primary infection.

Secondary infection: Any infection caused by inoculum produced as a result of a primary or a subsequent infection. OR An infection caused by secondary inoculum. Secondary inoculum: Inoculum produced by infections that took place during the same growing season.

Transmission: The transfer or spread of a pathogen from one plant to another.

Culture: To artificially grow micro-organisms on a prepared food material.

Immune: Cannot be infected by a given pathogen.

Resistant: Possessing qualities that hinder the development of a given pathogen. OR Infected little or not at all.

Susceptible: Lacking the inherent ability to resist disease or attack by a given pathogen; non-immune.

Tolerance: The ability of a plant to sustain the effects of a disease without dying or suffering serious injury or crop loss.

Disinfectant: A physical or chemical agent that frees a plant, organ or tissue from infection. OR The chemical agent that kills or suppress or inactivates pathogens in the environment or on the surface of a plant or plant organ before infection takes place.

Fungicide: Chemicals used to kill fungi OR A compound toxic to fungi.

Nematicides: A chemical compound that kills nematodes.

Bactericide: A chemical compound that kills bacteria.

Mycology: The study of fungi is called mycology. OR It is the science which deals with the study of fungi is known as mycology.

Nematology: It is the science which deals with the study of nematodes.

Virology: It is the science which deals with the study of viruses.

Bacteriology: It is the science which deals with the study of bacteria.

Eradication : the control of plant disease by eliminating the pathogen after it is established or by eliminating all of the plants that carry the pathogen.

Exclusion : a method of disease prevention in which the pathogen or infected plant material is excluded from crop production areas. See quarantine.

Quarantine : legal restriction of the transport of plants and/or plant parts in order to prevent the spread of pests and pathogens.

Race : a subgroup of pathogens within a species that infect a given set of plant varieties. Races may be distinguished from each other by virulence or symptom expression but not by morphology.

Systemic : (1) pertaining to a disease in which the pathogen spreads generally throughout the plant OR The growth of pathogen from the point of entry to varying extents without showing

adverse effect on tissues through which it passes.; (2) pertaining to a chemical absorbed into the plant through root or foliage and transported internally throughout the plant.

Systemic fungicide: a chemical agent that spreads internally through the plant and eradicates established fungal infections.

Vector: any living organism (e.g., insect, mite, bird, nematode, parasitic plant, human, etc.) that transmits a pathogen from an infected organism to an uninfected one.

Virus : a submicroscopic, non-cellular structure consisting of a core of infectious nucleic acid (either RNA or DNA) within a protein coat.

Necrosis: Death of tissue, cells or organ is known as necrosis.

Phyllody: Floral part converted into leafy structure is called as phyllody.

Hypertrophy: Excessive growth of host tissues due to increase in size of affected organs or cells of a particular tissues.

Hyperplasia: It is the abnormal increase in the size of a plant organ due to increase in number of cells of which the organ is composed.

Appressorium: The swollen tip of a hypha or germ tube that facilitates attachment and penetration of the host by the fungus.

Disease cycle: The chain of events as the transmission of pathogen, attack on the host, infection, invasion of tissues and development and reproduction of pathogen on the host to completing the process of pathogenesis.

Antagonism: Injury, killing or inhibition of the growth of one species of microorganism to another microorganism.

Antagonists: An organism having the capacity or ability to inhibit the growth or interfere with the activity of another microorganism.

Antibiosis: Inhibition or destruction of one microorganism by a metabolic products of another microorganism.

Competition: The ability of one organism to utilize a substrate more efficiently than another microorganism.

Hyper parasitism: The parasitism of a parasite by another parasite. (*Rhizoctonia solani* on *Pythium* spp., *Fusarium maxima* on Rust fungi).

Hypersensitivity: Excessive sensitivity of plant tissue to certain pathogens. Affected cells are killed quickly blocking the advancement of obligate parasite.

**Adjuvants:** The inert materials added to a fungicide to improve the physical characteristics of the toxicant and its carrier. Most of them are surface active agents and cause variations in surface tension.

**Compatibility:** It is a combining ability of a chemical with each other without any adverse effect.

**Phytotoxicity:** The capacity of a compound to produce injury to plant.

**Tenacity:** It is an ability of chemicals/pesticides for holding them on plant surface.

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