

CRP 321: PRINCIPLES OF PLANT PATHOLOGY

COURSE UNIT: 2

FUNDAMENTALS OF PHYTOPATHOLOGY OF DISEASES OF TROPICAL CROPS

CHARACTERISTIC FEATURES OF PLANT DISEASES

Plants are the major sources and sustainer of life. The dependence of man and other animals on plant is earthly summarized as “all flesh is grass”. Man through the ages have recognized the role of plant disease in every sphere of life’s activities.

CONCEPT OF PLANT DISEASES

When a plant part or plant as a whole is disturbed by pathogen or certain environmental factors which prevents it from functioning normally in the area of cell division, differentiation, developing, absorption of water, mineral salt and translocation of this and elaborate, throughout the plant photosynthesis, utilization and storage of synthesized food, respiration, and reproduction of plants to its full genetic potentials, then the plant is diseased or any harmful deviation or alteration from the normal functioning or physiological processes or the normal development of the plant part.

(a) Symptoms

A symptom is a visible or otherwise detectable expression of abnormal physiological development of the plant. It can also be defined as effect due to mechanism of pathogenicity.

(b) Signs

In many diseases, the pathogen grow and produces various structures on the surface of the plants. These structures may be superficial mycelia as in the case of powdery mildew or sporing structures. Whenever such structures are visible, they are diagnosed as signs of pathogens.

(c) Infection

It is a process of establishment of contact of the pathogen with the susceptible cell tissue and organs of the host. It can also be defined as parasitic relationship between the host and pathogen

(d) Inoculation

It is a process by which a pathogen or its reproductive unit is brought in contact with the plant tissue. Inoculum is then the infective unit of pathogen.

(e) Pathogens

Any organism that is capable of disease causation

(f) Tolerance

Due to genetic composition of plant, even though disease infect them no visible symptom is produced on the plant and even when symptoms are produced out the plant is able to tolerate and not adversely affected.

(g) Resistance

Ability to stand infection

(h) Necrosis

It means cell death and this becomes visible when many cells or aerial of plant tissues are dead. Necrosis can be expressed as rots of roots, soft or dry rots of fleshy parts e.t.c.

(i) Endemic Diseases

A disease that is permanently established in a moderate or severe form in a definite area commonly in a country or part of a country.

(j) Infection Court

The site of invasion of a host by a parasitic organism and other openings in a plant.

(k) Indicator Plant

One which react to certain pathogen or environmental factors with obvious symptoms and it is used to assist in detection of the pathogen or environmental factors.

(l) Epidemic

A widespread temporary increase in the incidence of an infectious disease.

(m) Epiphytotic

A term used for an epidemic disease in plants.

SYMPTOMS OF PLANT DISEASES

- 1. Death of tissue or Necrosis-** various term describe the extent and shape of necrotic lesions particularly in leaves stripes for narrow elongated lesions, scorch, scald, fire and blotch for indefinite area which often becomes bleached and their brittle and leaf spot for well defined lesions of limited extent. Occasionally the dead tissue of a leaf spot falls away and the symptom is called short hole
- 2. Abnormal increase in tissue-** this can result from both increase in size (Hyperthropy) and increase in number (Hyperplasia) of cells. The more common symptoms of this type are witches broom, galls, cankers and scab.
- 3. Failure of normal size (Hypoplasia)-** an overall dwarfing or stunting of the plant is common in many diseases. In some, the leaves are superficially affected.
- 4. Wilting-** caused by an interference with the normal movement of water.
- 5. Changes in colour-** yellowing or chlorosis is a common symptom of disease and often associated with tissues surrounding a necrotic area. The chlorophyll may be degraded or fail to develop. In the later instance, the symptoms could be considered to fall in the previous group. There may be other colour changes such as development or transformation of organs. For example, this is common with plants infected with the Smut fungus *Ustilago violaceae*, this develop although at maturity, they contain pollen but smut spores. Similarly, maize infected with *Ustilago maydis*, the staminate inflorescence may bear pistillate flower. A transformation of a different type occur in certain fungi diseases of fruits. The fruits dried out and becomes hard and is then virtually a fungal sclerotium.
- 6. Disintegration of tissues**
This is termed rot. It may be accompanied by a release of cell fluids (wet rot) so much that there is an exudates from partially disintegrated tissue (leak). Alternatively, the cell may crumble to a powdery mass (dry rot)

7. **Excess gum formation**- this is particularly associated with disease of trees known as gummosis or gummy.