

## **Quadrant II – Transcript and Related Materials**

**Programme: Bachelor of Science (Third Year)**

**Subject: Botany**

**Course Code: BOC 107**

**Course Title: Microbiology and plant pathology**

**Unit: 8**

**Module Name: Plant disease epidemic.**

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### **Notes**

**Epidemiology** is the study of the outbreak of Disease, its course, intensity, cause and effects and the various factor governing it.

**Epidemic** is the sudden outbreak of a disease periodically over a widespread area in a devastatingly severe form causing severe losses or complete destruction.

### **Factors Responsible for Disease epidemic**

#### **1. Host factors that affect the development of epidemics**

- a. Levels of Genetic Resistance or Susceptibility of the Host
- b. Degree of Genetic Uniformity of host plant
- c. Type of crop
- d. Age of Host Plants

#### **2. Pathogen Factors that Affect Development of Epidemics**

- a. Levels of virulence
- b. Quantity of inoculum near hosts
- c. Type of Reproduction of the pathogen
- d. Ecology of the Pathogen
- e. Mode of Spread of the pathogen

### **3. Environmental factors that affect development of Epidemic**

- a. Moisture
- b. Temperature

### **4. Effect of Human Cultural Practices and Control Measures**

- a. Site selection and preparation
- b. Selection of propagative material
- c. Cultural practices
- d. Disease control measures
- e. Introduction of New Pathogens

### **Monocyclic and polycyclic epidemic**

Pathogens that produce only one cycle of development (one infection cycle) per crop cycle are called **monocyclic**, while pathogens that produce more than one infection cycle per crop cycle are called **polycyclic**.

**Monocyclic epidemic:** In general, there are three types of plant diseases that tend to produce only one infection cycle per host cycle

**(1) Postharvest diseases:** Not all postharvest diseases produce monocyclic epidemics, but in many cases the infections that result in storage rots have either already occurred before harvest or occur during the harvest and postharvest handling before the product goes into storage

**(2) Diseases caused by soil-borne plant pathogens:** Many of the root rots, vascular wilts, and other diseases caused by soil borne pathogens also produce only one infection cycle per crop cycle.

The inoculum generally is some kind of survival structure resistant to desiccation or freezing, such as sclerotia, chlamydospores, or oospores in the soil or mycelium in crop residues

**(3) Rusts without a urediniospore stage:** Some rusts produce no urediniospore stage (repeating stage) on a single host, and the inoculum produced on one host species generally must infect a different host species.

This alternation of hosts appears to have evolved in adaptation to the annual growth cycles of the hosts, and we see one infection cycle on each host per year.

### **Polycyclic epidemic**

In a polycyclic epidemic repeated complete infection cycles is followed by pathogen development, new inoculum production, dispersal to new susceptible sites, and new infections, all within a single crop cycle

Example: Potato late blight