

Salahaddin University- Erbil
Collage of Agricultural Engineering sciences
Plant Protection Department
4th Year Students



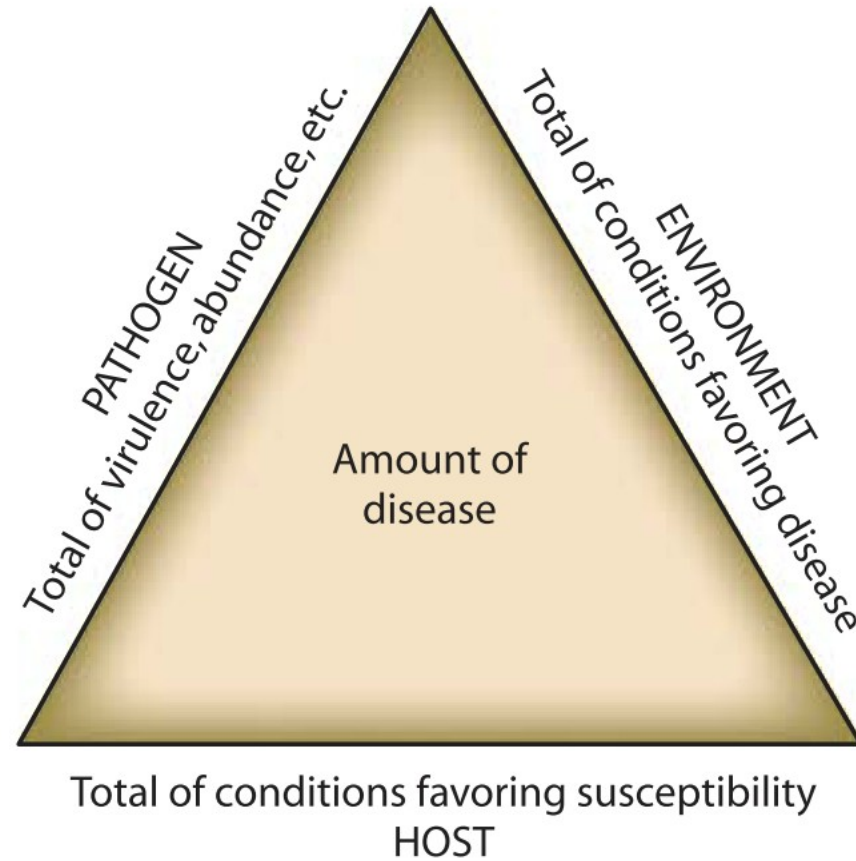
Horticulture Disease

Lecture 2: DISEASE DEVELOPMENT

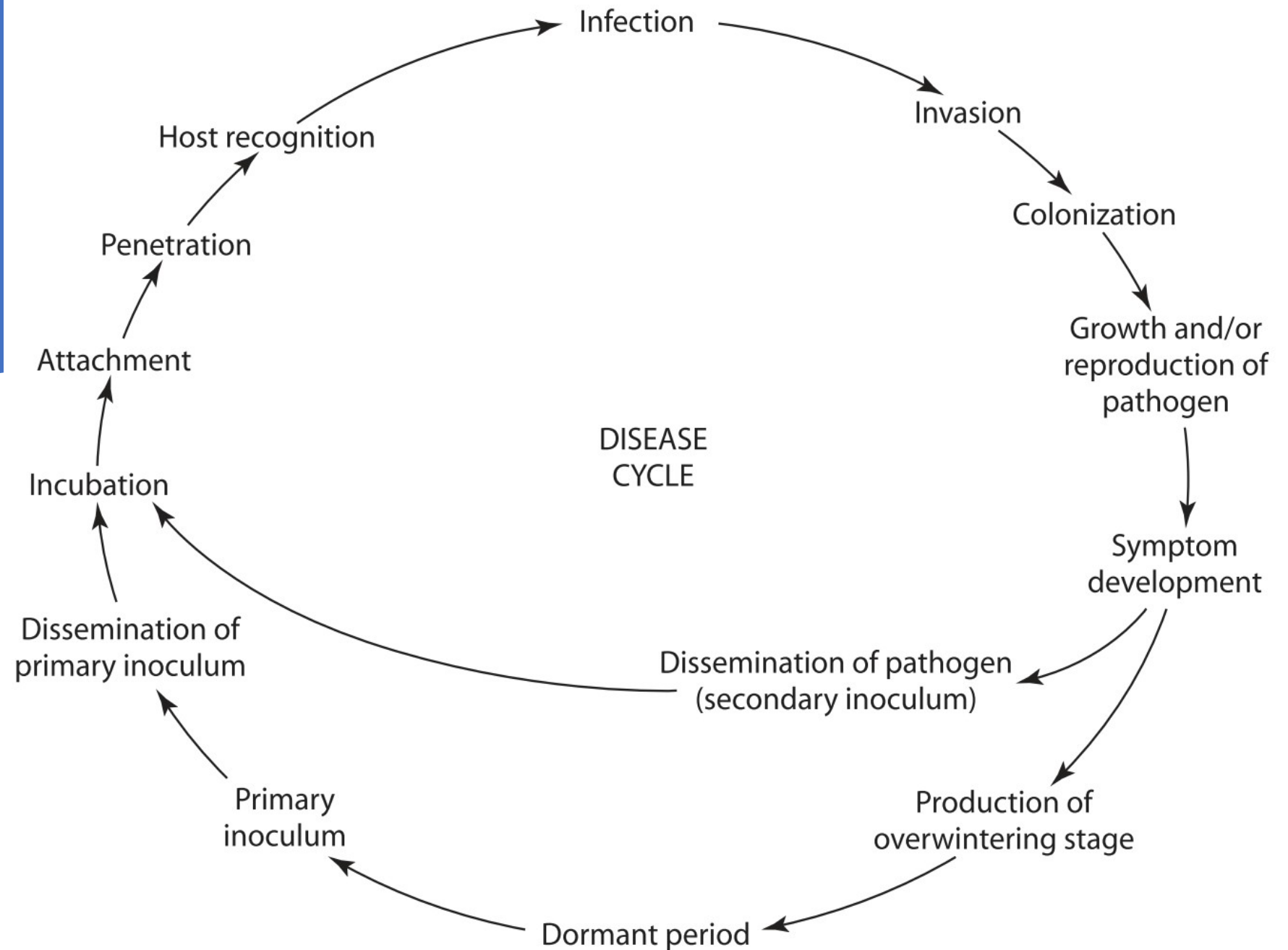
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Disease triangle



STAGES IN THE DEVELOPMENT OF DISEASE: *THE DISEASE CYCLE*



- **Inoculation:** is the initial contact of a pathogen with a site of plant where infection is possible.
- The pathogen(s) that lands on or is otherwise brought into contact with the plant is called the **inoculum**.
- The inoculum is any part of the pathogen that can initiate infection.
- **Fungi:** spores, sclerotia (i.e., a compact mass of mycelium), or fragments of mycelium.
- **Bacteria, mollicutes, protozoa, viruses, and viroids**, the inoculum is always whole individuals of bacteria,
- **Nematodes**, the inoculum may be adult nematodes, nematode juveniles, or eggs.
- **Parasitic higher plants**, the inoculum may be plant fragments or seeds.

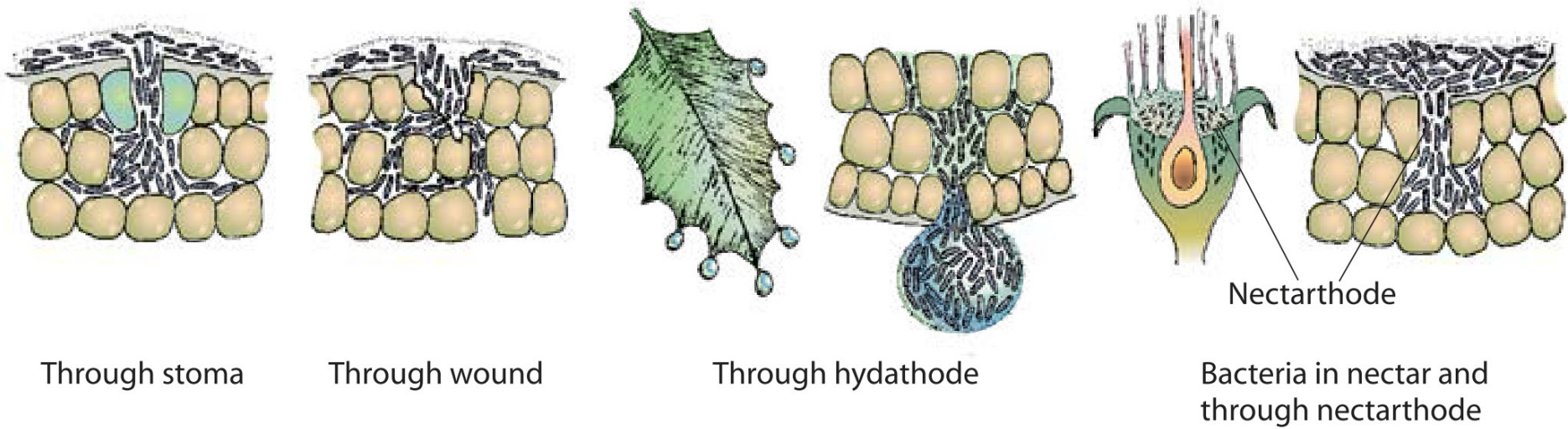
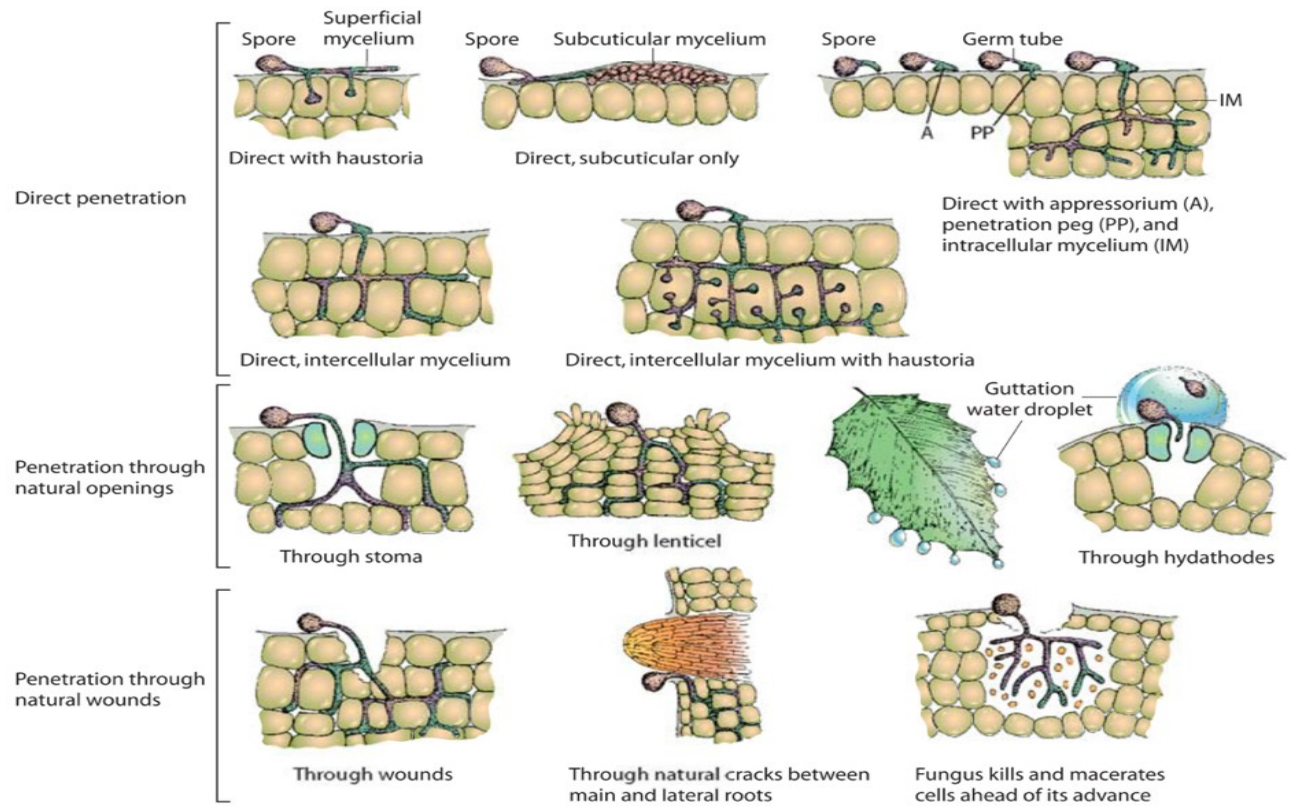
- **Types of Inoculum:**

- An inoculum that survives dormant in the winter or summer and causes the original infections in the spring or in the autumn is called a **primary inoculum**.
- An inoculum produced from primary infections is called a **secondary inoculum**.

- **Sources of Inoculum:**

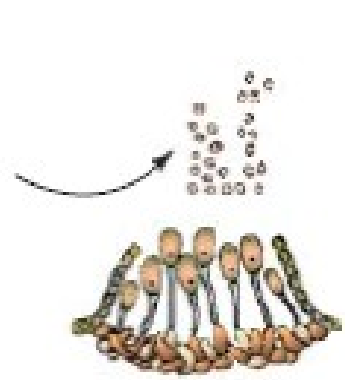
1. **In the plant debris or soil in the field where the crop is grown.**
2. **Seed, Transplants, tubers, or other propagative organs.**
3. **Nearby plants or fields**
4. **Some kind of vector, such as an insect**

- **Penetration:**
- **Direct Penetration through Intact Plant Surfaces**
- **Penetration through Wounds**
- **Penetration through Natural Openings**

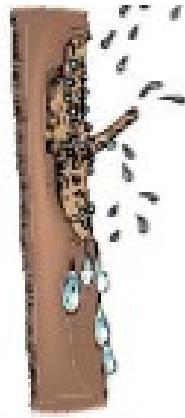


- **Infection:** is the process by which pathogens establish contact with susceptible cells or tissues of the host and procure nutrients from them.
- **Invasion:** Various pathogens invade hosts in different ways and to different extents. **intracellular mycelium** by **intercellular mycelium**.

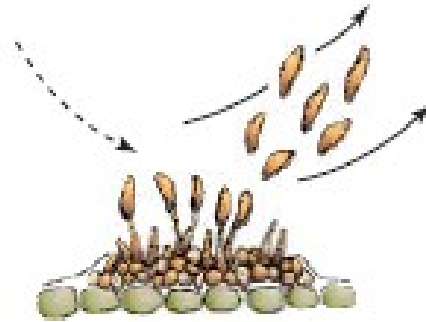
Dissemination of the Pathogen



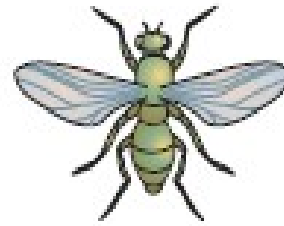
Wind



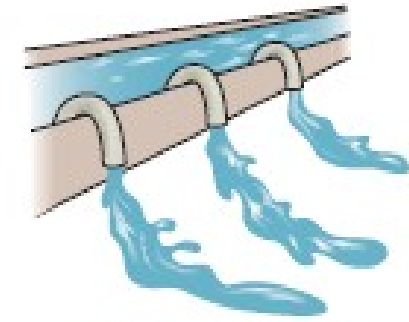
Rain-splashes and run-off



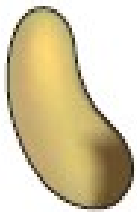
Wind-blown rain



Insects



Irrigation or flooding



Contaminated seeds



Infected transplants



Animals



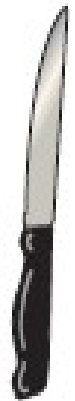
Boots



Tractors or plows



Pruning shears



Knives

RELATIONSHIPS BETWEEN DISEASE CYCLES AND EPIDEMICS

- Monocyclic
- Polycyclic

