

University of Salahaddin
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Plant Protection Department



Forest Diseases

first Lecture /3rd. stage

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Outline

- ❖ Forest Diseases
- ❖ Plant Disease Triangle
- ❖ Cause of plant Diseases
- ❖ Inoculum and source of inoculum
- ❖ The spread of plant diseases
- ❖ Symptoms of forest trees diseases
- ❖ Signs of some pathogens on the forest trees

Forest Disease

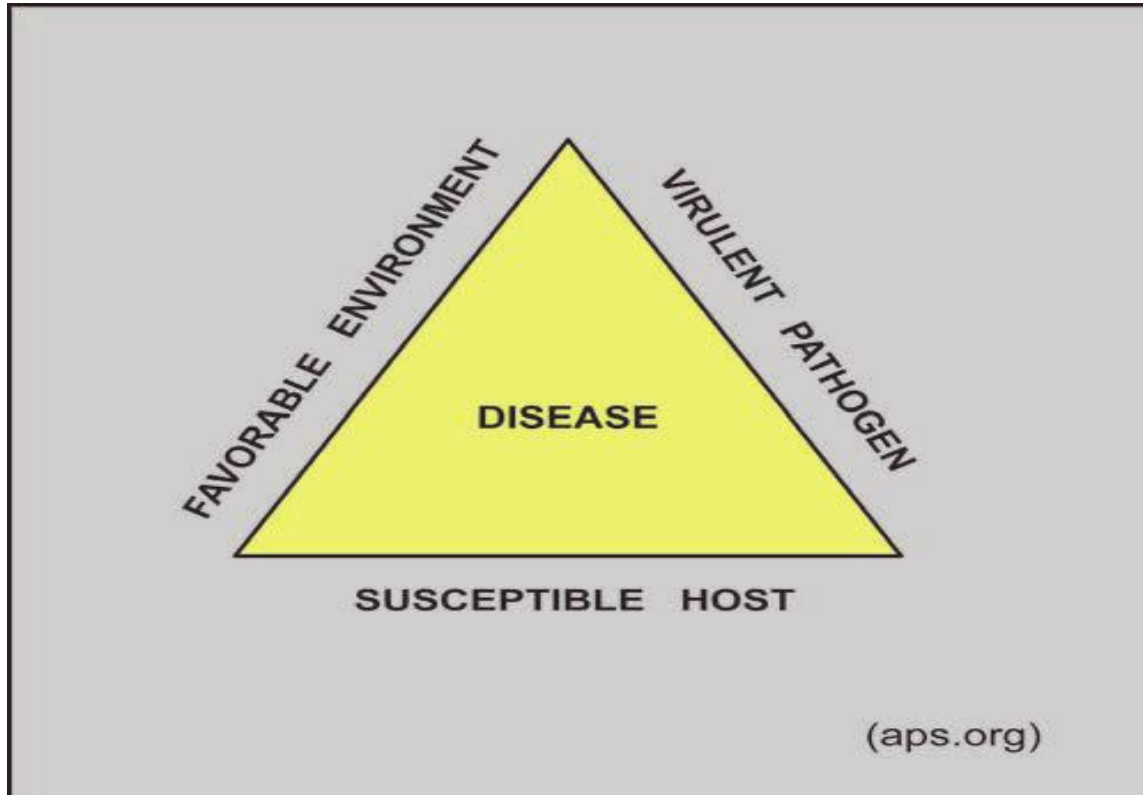
Is the disorganization of the normal physiology activity of tree caused by some factors (biotic and abiotic) which make characteristic symptoms and affecting the health of a forest ecosystem.

Each year, forest diseases destroy a higher volume of trees than even wildfires do.

Why should study forest diseases?

- 1- Death of plants or growth reduction
- 2- Reduction in tree quality
- 3- Aesthetic value.
- 4- Cost of disease control .
- 5- Impact on ecosystems .
- 6- Economic losses

Plant Disease Triangle



Factors of plant diseases

The agent that cause disease may be living or non living

- A- Biotic factor –living agent
 1. Fungi
 2. Bacteria
 3. Viruses
 4. Nematodes
 5. Parasitic higher Plants

B- abiotic causes- non living agent

- 1-Deficiencies or excess of nutrients
- 2- Fire
- 3- Wind
- 4-low and high Temperature
- 5-Air pollutants
- 6-Toxicity of pesticides
- 7- Light

Inoculum

Inoculum is defined as the part of the pathogen, which on contact with a suitable host can cause infection.



spore



mycelia

Primary inoculum: The overwintering or oversummering pathogen, or its spores that cause primary infection.

Secondary inoculum: Inoculum produced by infections that take place during the same growing season.

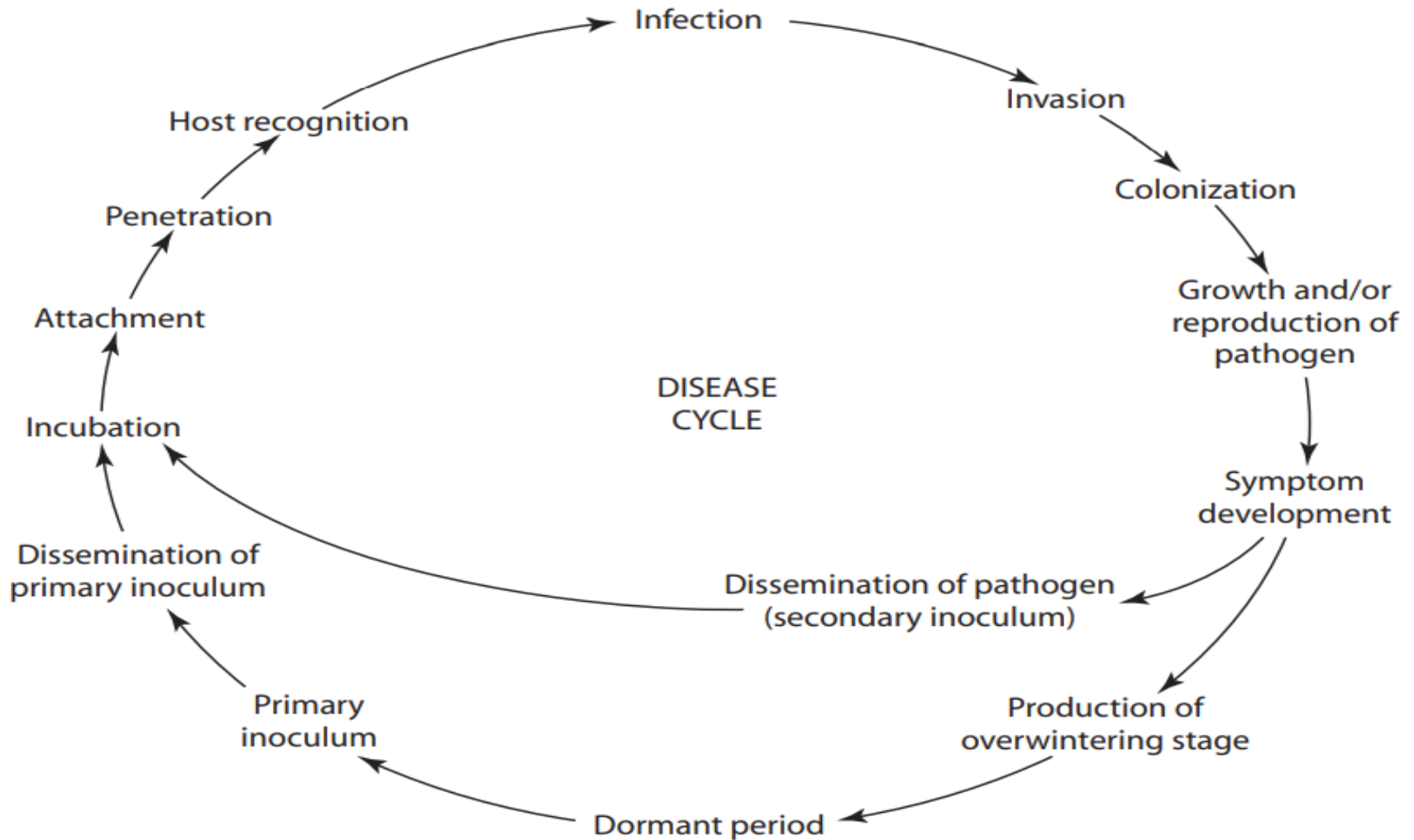
Sources of inoculum

1. affected plants (diseased) in the forest.
2. leaf debris left on the land or used in compost heaps.
3. soil infested with certain soil-borne pathogens.

Spread of the Disease

- **Plant diseases are spread in various ways:**
- 1. Spread through infected seeds.
- 2. Spread by natural agents such as wind and rain
- 3. Spread by animals and insects
- 4. Spread by people
- 5. by planting materials

Every infectious disease requires a series of sequential events in order for disease to develop.



Symptoms of Forest Diseases

- **Powdery mildew**
- is a common disease that appears as a white powdery substance on the leaf surface. The powdery appearance comes from millions of tiny fungal spores.



Rusts

- Is one of the important forest disease which make an orange or yellowish spots on the tree parts. Rusts may affect leaves, stems, cones, needles. a well known rust is white pine blister rust which cause enormous damage of pine trees.



Damping Off

- destruction of seeds in the soil, or seedlings near the soil line, resulting in reduced stand, or the seedling falling over on the ground. Damping off caused by many soil born fungi *Phytophthora* spp., *Pythium* spp., *Fusarium* spp., and *Rhizoctonia solani*.



Canker

Cankers are localized sunken dead areas on the branches, twigs, or trunk of a tree. caused by a number of factors, including abiotic causes (sunscald and frost) and biotic factors(fungi and bacteria).



Chlorosis - yellowing

- Is the reduction of normal green color of leaves caused by some factors the most important factor is lack of iron, manganese, minerals and poor absorption of micronutrients.



Gall

- Abnormal localized swelling or enlargement of stems shoots and roots of the plant. It could be caused by bacteria, nematodes, insects, mites, or abiotic factors.



Mosaic

Mosaic a plant disease caused by virus. The common symptoms is irregular leaf mottling (light and dark green or yellow patches or streaks). Leaves are commonly stunted and curled. Veins may be lighter than normal or banded with dark green or yellow. Plants are often dwarfed.



Leaf spot

Generally, fungal leaf spots possess a distinct dark brown or red margin between the interior (dead) and exterior (healthy green) tissue called a border.



Die-back :

The name of Die back refers to Progressive death of shoots, branches or roots starting at the tip of the plant. Die-back may be cause by biotic and abiotic factors.



Wilt : Withering and drooping of a plant starting from some leaves to growing tip occurs suddenly or gradually.



Witches broom :

Abnormal broom-like growth of many weak shoots.



Blight: a rapid discoloration and death of twigs, foliage, or flowers.



Leaf scorch: Burning the edges of leaves and tips and progress to leaf midrib.



Signs: are the actual organisms causing the disease.

Signs include:

- ✓ Conks
- ✓ Mushrooms
- ✓ Mycelium
- ✓ Ooze



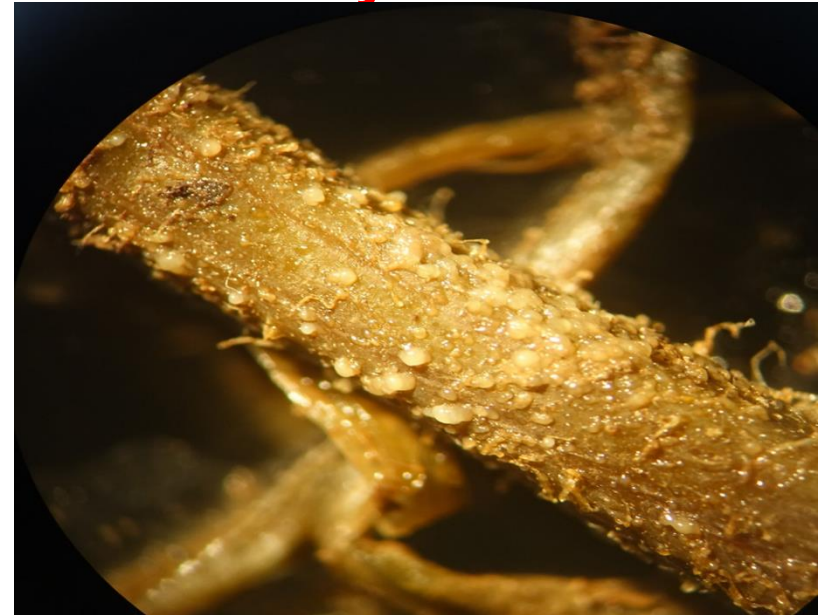
mashroom



mycelia



Conks



Ooze