

University of Salahaddin  
College of Agriculture  
Plant Protection Department



# Forest Diseases

first Lecture /3<sup>rd</sup>. stage

**By Mr. Muhammed Zrar Bakir**

M.Sc in Plant Protection  
muhammed.bakir@su.edu.krd

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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- Economic losses
- 4- Cost of disease control .
- 5- Impact on ecosystems .
- 6- Aesthetic value.

# Forest diseases

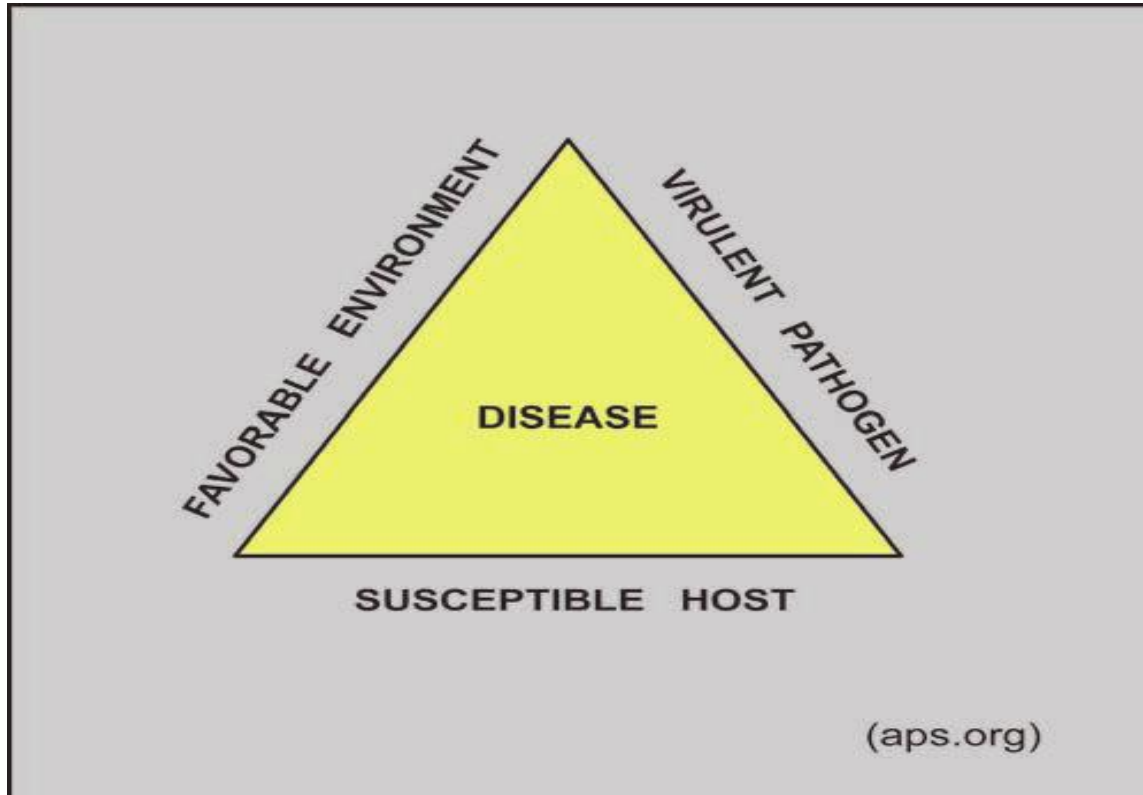


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Forest pathology

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# 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. Nematodes
  4. Parasitic higher Plants
  5. Viruses .....

## **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.



**Chlamydospores**



**Sclerotia**

**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.

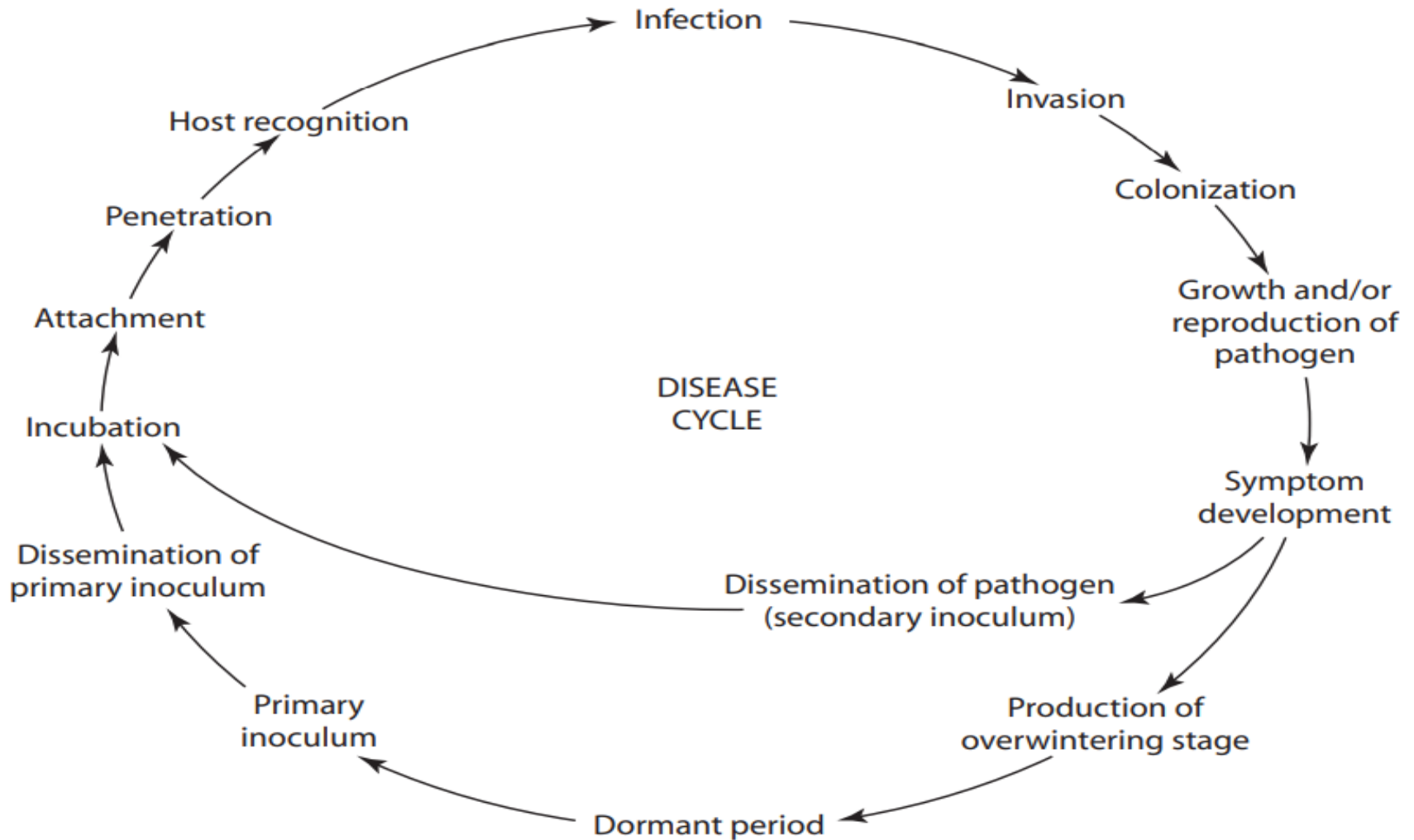
## Sources of inoculum

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

**Conks:** Woody reproductive structures of fungi that grow from the trunk or base of a tree



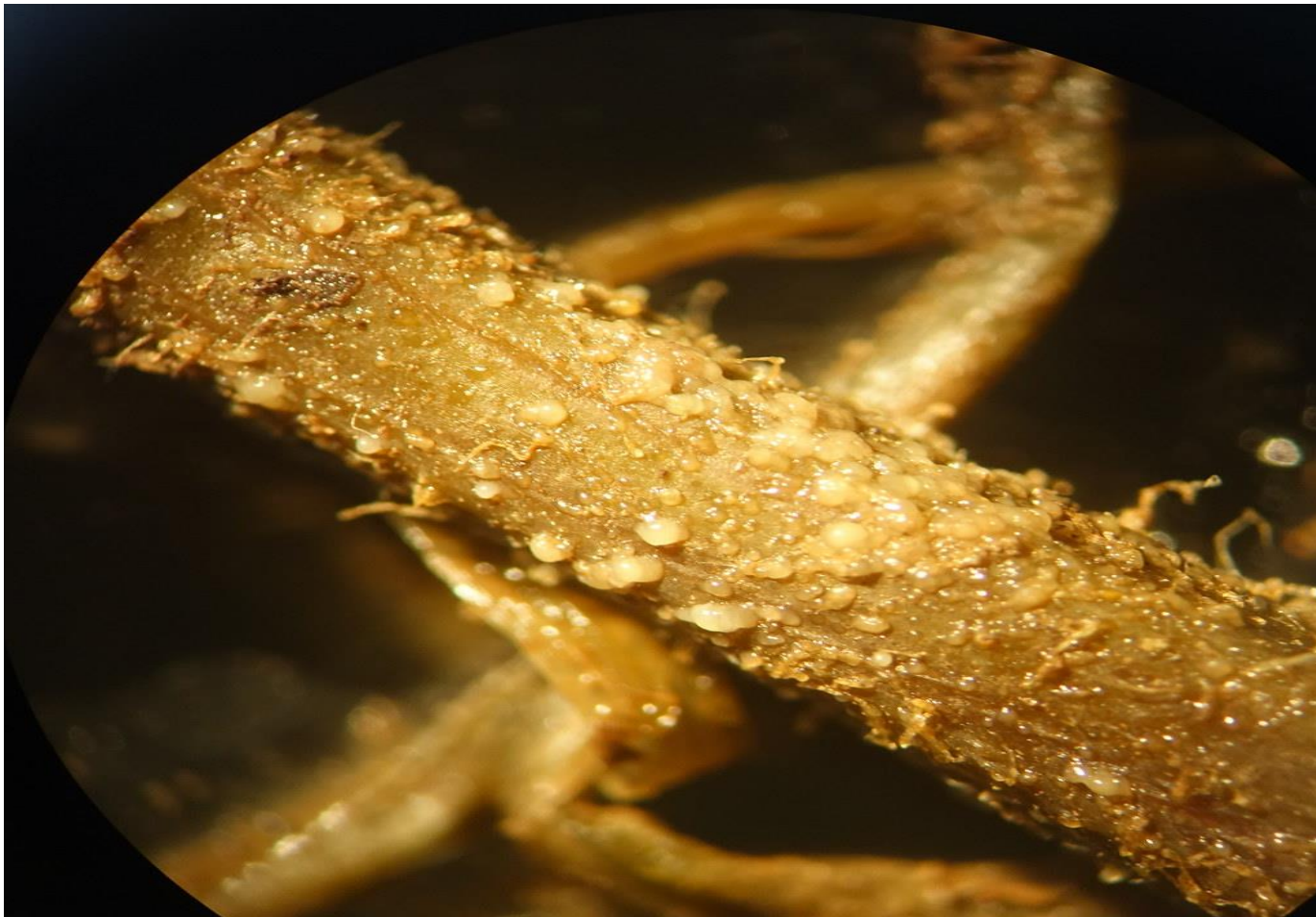
**Mushrooms:** Fleshy reproductive structures of fungi.



**Mycelium** : the mass of thread-like structure (hyphae) of a fungus.



**Ooze:** A stiky exudate being composed mostly of bacterial cells



Thank you