b- Necrosis of the woody tissues:

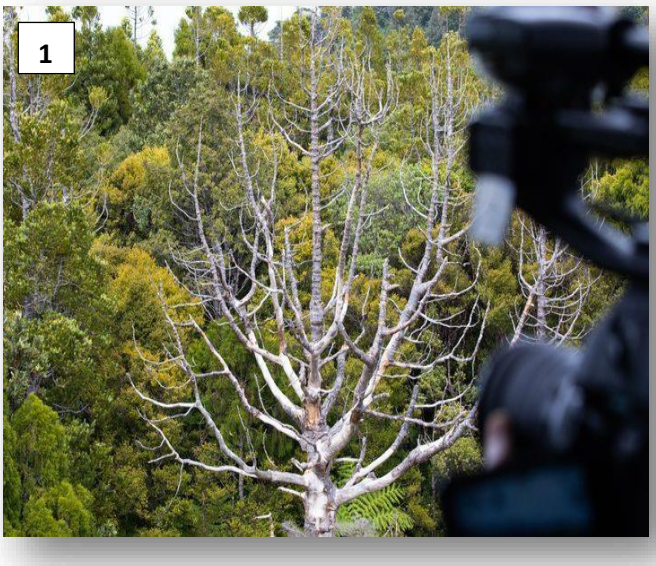
1- Dieback: is common symptom or name of disease, especially of woody plants, characterized by progressive inward death of branches, twigs, shoots, or roots, starting at the tips. All trees are susceptible to dieback and decline because of the combined effects of primary stress and attack of secondary organisms **(pic.1)**.

Causative agents: Bacteria, fungi, abiotic effects.

staghead a dieback in which the shape of the projecting dead branches suggests a stag's horns**.**

2- Cankers: are a plant disease or a symptom that look round to irregular sunken, swollen, flattened, cracked, discolored, or dead areas on the stems, twigs, limbs, or trunk due to death of tissue of bark. Cankers may enlarge and girdle a twig or branch, killing the foliage beyond it **(Pic. 2)**.

Causative agents: Numerous species of fungi and bacteria, that occurs primarily on woody species. They are most common on plants weakened by cold or drought stresses, insect injury, nutritional imbalances, nematodes, or root rot.



3- Gummosis: exudating or oozing of gum-like secretions from the woody tissues on trees **(Pic.3)**. These stone fruits form as a response to injuries that caused by any biotic or abiotic factors. It can also be a response to poor growing conditions, such as compacted soil. If the oozing gum is clear, the problem is abiotic (non-living). If the ooze is milky or dark-colored, it may be caused by an insect or disease.

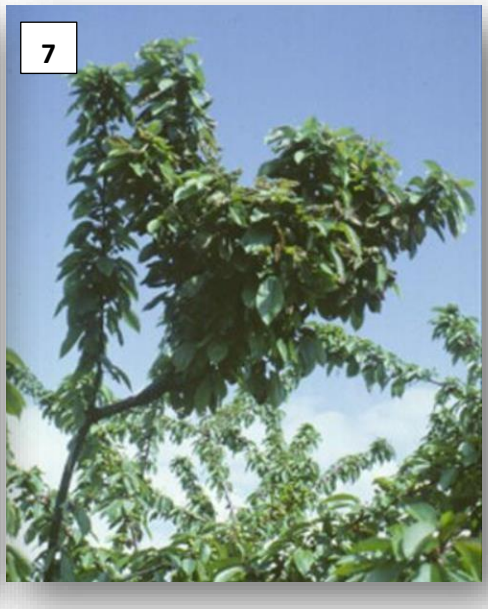
Causative agents: gumming is produced due to a variety of factors, including borers, diseases, or wounding.

c- Necrosis of the storage organs: characterized by softening, discoloration, and often decay of a succulent plant tissue because of fungal or bacterial infection. This type of necrosis usually occurs in fruits and roots parts.

1- Root rot: caused by numerous fungi, especially *Fusarium*, and many oomycetes, including *Pythium*, *Phytophthora*. Plants lose vigour, become stunted and yellow, and may wilt or die back and drop some leaves **(Pic. 4)**.

2- Fruits rot: as this part of plant rich in moist, nutrients, and freely exposes to different pathogens, this type of rot is common on soft fruits which characterized primarily by the rotting, wrinkling, and desiccation **(Pic.5)**.

Hypertrophy symptoms: is overgrowth of an organ due to increase in size of individual cells, e.g., corn galls **(Pic.6)** and witches' brooms of Cherry **(Pic.7)**.



Hyperplasia symptoms: is the overgrowth of tissue or organ due to increased cell division and cell number. Hyperplasia may indicate a hormonal imbalance in a plant caused by disease of plant pathogens or parasitic insects' infestation. e.g., crown ball on peach trees **(Pic.8)**.

Hypoplastic (hypoplasia) symptoms: a condition of arrested development in which an organ or part remains below the normal size or in an immature state:

1- Rosette: In this the internodes do not enlarge, and leaves are clustered like petals of rose (the leaves form a radial cluster on the stem). e.g., Groundnut rosette virus disease **(Pic.9)**.

2- Mosaic: Appearance of dark green, light green pattern or sometimes chlorotic areas on leaves due to virus infection **(Pic.10)**. e.g., golden bean mosaic virus.

3- Atrophy or stunting or Dwarfing: failure of plants to attain full size. e.g., corn stunt disease **(Pic.11)**.