

# Plant diseases – teacher’s answer sheet

1. How is climate change affecting plant health?

- ✓ **changes in temperature and rainfall provide ideal conditions for disease and pests to spread**
- changes in temperature and rainfall provide poor conditions for disease and pests to spread

*Climate change is a major driver of diseases and pests spreading quickly. International travel and trade also plays a role in diseases and pests spreading across the globe.*

2. **True or false:** spores on ferns are a sign of fungal disease.

- true
- ✓ **false**

*Although spores on the underside of a fern leaf may look like a disease, they are the plant’s method of reproduction.*

3. What does witch hazel produce as a defence against pathogens?

- an alkaloid chemical
- ✓ **an antibacterial chemical**
- extra thick cell walls

*Witch hazel produces an antibacterial chemical as a defence against bacterial pathogens which have managed to get inside the plant.*

4. Fill in the gaps using the words below.

Knopper galls are caused by a **parasitic** wasp. It lays its **eggs** on developing **acorn** buds, then the oak develops a **growth** which protects and feeds the **larvae** as it grows.

*Galls are abnormal growths produced by a plant in response to an outside organism, in this case a parasite.*

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5. Why does the rubber tree produce latex sap when wounded?

- to trap and kill insects and stop bacterial enzymes from digesting cell walls
- ✓ **to trap and kill insects and to seal the wound, preventing pathogen infection**
- to stop bacterial enzymes from digesting cell walls and to seal the wound, preventing pathogen infection

*The rubber’s latex sap is an effective defence mechanism against both pests and diseases.*

6. What kind of disease is ash dieback?

- viral
- ✓ **fungal**
- bacterial

*Ash dieback is caused by the fungus *Hymenoscyphus fraxineus*.*

7. How does ash dieback affect ash trees?

- ✓ **The pathogen modifies the plant’s cell structure by secreting effector proteins that allowing the pathogen to grow within the plant**
- The pathogen produces a white powdery coating on the plant’s leaves, reducing the plant’s ability to photosynthesise

*The effector proteins enter the plant’s cell and ‘hack’ its immune system so that the pathogen can grow within the plant.*

8. What percentage of ash trees could ash dieback wipe out?

- 100%
- ✓ **90%**
- 50%

*Whilst ash dieback could kill an extremely large proportion of ash trees, some ash trees are displaying tolerance to the disease.*

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9. What does Kew’s UK Ash Collecting Project aim to do?

- survey the health of ash populations and collect seeds and sample tissues from trees suffering from the disease
- ✓ **survey the health of ash populations and collect seeds and sample tissues from trees showing tolerance to the disease**

*This will allow research to be carried out into how quickly ash trees might evolve to resist the disease.*

10. Ash seeds will be stored in Kew’s Millenium Seed Bank. What is the Millenium Seed Bank an example of?

- in-situ conservation
- ✓ **ex-situ conservation**

*The Millenium Seed Bank is a collection of over 2.4 billion seeds from around the world. The seeds are stored away from the natural habitat and so are ex-situ.*