

Exercise walk-through

3.4

Plant disease – biology only (4.3.3)

AQA · GCSE · Biology

Exercises 2.1-2.3

2.1 Give three signs of plant disease.

[3]

2.2 State the ion whose deficiency causes chlorosis and why.

[2]

2.3 Give one physical and one chemical plant defence.

[2]

Exercises 2.1·2.3

2.1 Give three signs of plant disease. [3]

2.1 Any three: stunted growth, spots, decay/rot, growths, malformed stems/leaves, discolouration, visible pests.

2.2 State the ion whose deficiency causes chlorosis and why. [2]

2.2 Magnesium ions; magnesium is needed to make chlorophyll, without which leaves cannot absorb light for photosynthesis.

2.3 Give one physical and one chemical plant defence. [2]

2.3 Physical: cellulose cell wall / waxy cuticle / bark. Chemical: antibacterial chemical / poison deterring herbivores.

Exercises 3.1·3.3

3.1 A gardener's tomato plants show yellowing leaves and poor growth. Describe two ways to identify the problem. [4]

3.2 Explain how magnesium deficiency reduces growth. [3]

3.3 Rose plants have thorns; some plants droop when touched. For each, name the defence category and explain the benefit. [4]

Exercises 3.1·3.3

3.1 A gardener's tomato plants show yellowing leaves and poor growth. Describe two ways to identify the problem. [4]

3.1 Any two fully described: compare the symptoms with a gardening manual or website; take a diseased plant, or a sample, to a laboratory for analysis of the pathogen; use a monoclonal-antibody testing kit on a tissue sample. Max 4 with one mark for the method and one for how it gives the answer each.

3.2 Explain how magnesium deficiency reduces growth. [3]

3.2 Without magnesium, the plant cannot make chlorophyll; less light energy can be absorbed, so photosynthesis is reduced; less glucose is produced, so there is less energy and material for growth.

3.3 Rose plants have thorns; some plants droop when touched. For each, name the defence category and explain the benefit. [4]

3.3 Thorns – a mechanical defence; they deter animals from eating or climbing the plant. Drooping when touched – also mechanical; it discourages grazing insects or makes the plant seem less appetising / knocks pests off.