

OCR (B) Biology GCSE

Topic B4.4: How is plant growth
controlled? **(biology only)**

Flashcards



What are plant tropisms?



What are plant tropisms?

The growth response of a plant to a stimulus



What is positive tropism?



What is positive tropism?

The growth of a plant towards a stimulus



What is negative tropism?



What is negative tropism?

The growth of a plant away from a stimulus



What are the two main types of plant tropism?



What are the two main types of plant tropism?

Phototropism

Gravitropism



Define phototropism



Define phototropism

A plant's growth response to light



Define gravitropism



Define gravitropism

A plant's growth response to gravity



What are auxins?



What are auxins?

- A group of plant hormones involved in plant tropisms
- Control growth in plant roots and shoot tips



Compare the effect of auxins in plant shoots and roots



Compare the effect of auxins in plant shoots and roots

Auxins stimulate growth in plant shoots

Auxins inhibit growth in plant roots



Where are auxins produced?



Where are auxins produced?

Root and shoot tips



How do auxins move through a plant?



How do auxins move through a plant?

They diffuse through the plant in solution



Are plant shoots positively or negatively phototropic? How does this affect shoot growth?



Are plant shoots positively or negatively phototropic?
How does this affect shoot growth?

- Positively phototropic
- Plant shoots grow towards the light



Explain why plant shoots are positively phototropic



Explain why plant shoots are positively phototropic

- Shoot tip exposed to light
- On the shaded side of the root, auxin accumulates
- Elongation of cells on the shaded side
- Shoot tip bends towards the light



Are plant shoots positively or negatively gravitropic? How does this affect shoot growth?



Are plant shoots positively or negatively gravitropic?
How does this affect shoot growth?

- Negatively gravitropic
- Plant shoots grow upwards, away from gravity



Explain why plant shoots are negatively gravitropic



Explain why plant shoots are negatively gravitropic

- Shoot placed horizontally
- Due to gravity, auxin accumulates on the lower side of the shoot
- Elongation of cells on the lower side
- Shoot bends upwards growing away from gravity



Are plant roots positively or negatively phototropic? How does this affect root growth?



Are plant roots positively or negatively phototropic?
How does this affect root growth?

- Negatively phototropic
- Plant roots grow away from the light



Explain why plant roots are negatively phototropic



Explain why plant roots are negatively phototropic

- Root exposed to light
- On the shaded side of the root, auxin accumulates
- Inhibition of cell growth on the shaded side
- Root grows away from the light



Are plant roots positively or negatively gravitropic? How does this affect root growth?



Are plant roots positively or negatively gravitropic?
How does this affect root growth?

- Positively gravitropic
- Plant roots grow downwards, towards gravity



Explain why plant roots are positively gravitropic



Explain why plant roots are positively gravitropic

- Root placed horizontally
- Due to gravity, auxin accumulates on the lower side of the root
- Inhibition of cell growth on the lower side
- Root bends downwards growing towards gravity



Explain how plant tropisms increase the chance of survival



Explain how plant tropisms increase the chance of survival

- They enable plants to respond to their environment
- Shoot growth towards the light maximises light absorption
- Root growth downwards increases the uptake of water and minerals from the soil and enables anchorage of the plant body to the ground



Describe the role of auxins in
commercial plant cultivation (**higher**)



Describe the role of auxins in commercial plant cultivation (**higher**)

- Rooting powders contain auxins
- Auxins stimulate the growth of roots in cuttings
- Enables rapid plant cloning



What are gibberellins? (higher)



What are gibberellins? (higher)

Plant hormones that control germination
and flowering



How do gibberellins trigger germination? (higher)



How do gibberellins trigger germination? (**higher**)

In the presence of water, gibberellins break seed dormancy, initiating germination.



What is 'bolting' in plants? (higher)



What is 'bolting' in plants? (higher)

- In response to a period of low temperatures or limited water availability
- Flowering and seed production increase in a final bid for a plant to reproduce before death
- Triggered by gibberellins



Why are gibberellins important in commercial plant cultivation? (higher)



Why are gibberellins important in commercial plant cultivation? (higher)

- Applied to seeds to make them germinate at times of the year when they naturally wouldn't
- Makes sure all seeds germinate at the same time
- Initiate flowering in plants at any time of the year
- Enable flowering under conditions in which plants would normally not
- Can increase fruit size



What effect does ethene have on plants?
(higher)



What effect does ethene have on plants? (higher)

- Causes dead leaves to drop off a plant by triggering the expansion and bursting of cells in leaf stalks
- Stimulates enzymes that control fruit ripening



Why is ethene important in commercial plant cultivation? (higher)



Why is ethene important in commercial plant cultivation? (**higher**)

- Used to remove the dead leaves from plants, aiding the collection of fruits and seeds
- Enables fruits to be picked while they are unripe and less easily damaged. They can be stimulated to ripen during transportation to shops.

