

Edexcel Biology GCSE

Topics 6.15B to 6.16B - Controlling plant
growth (**Biology only**)

Flashcards



What are plant tropisms?



What are plant tropisms?

The growth of a plant to in response 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 shoot, 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 that stimulate the growth of roots in cuttings. Enables rapid plant cloning.
- Used in selective **weedkillers** that target and alter growth patterns in broad-leaved plants (most weeds), killing them.



What are gibberellins? (higher)



What are gibberellins? (higher)

Plant hormones that control germination and flowering



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



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

- Initiate **germination** in seeds at times of the year when they naturally wouldn't. Ensure all seeds in a batch germinate.
- Trigger **flowering** in plants under irregular conditions. Also increase **fruit size** by reducing the number of flowers produced by plants.
- Produce **seedless fruits** by stimulating the growth of fruit from unpollinated flowers.



How do gibberellins trigger germination? (higher)



How do gibberellins trigger germination? (higher)

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



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



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

- Ethene stimulates enzymes that control **fruit ripening**
- Enables fruits to be picked while they are unripe and less easily damaged. They can be stimulated to ripen during transportation to shops.

