WJEC England Biology GCSE

4.4 - Plant hormones

Flashcards

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What are plant tropisms?

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What are plant tropisms?

The growth response of a plant to a stimulus

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What is positive tropism?

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What is positive tropism?

The growth of a plant towards a stimulus

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What is negative tropism?

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What is negative tropism?

The growth of a plant away from a stimulus

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What are the two main types of plant tropism?

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What are the two main types of plant tropism?

Phototropism

Gravitropism

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Define phototropism

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Define phototropism

A plant's growth response to light

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

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

- Positively phototropic
- Plant shoots grow towards the light

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

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

- Negatively phototropic
- Plant roots grow away from the light

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Define gravitropism

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Define gravitropism

A plant's growth response to gravity

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

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

- Positively gravitropic
- Plant roots grow downwards, towards gravity

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

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

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

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Explain how plant tropisms increase the chance of survival

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Explain how plant tropisms increase the chance of survival

- 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

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What are auxins?

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What are auxins?

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

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Where are auxins produced?

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Where are auxins produced?

Root and shoot tips

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How do auxins affect plant shoots?

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How do auxins affect plant shoots?

They stimulate growth in plant shoots

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How do auxins affect plant roots?

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How do auxins affect plant roots?

They inhibit growth in plant roots

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How are auxins affected by light?

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How are auxins affected by light?

Light inhibits the effect of auxins

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Explain why plant shoots are positively phototropic

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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

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Explain why plant roots are negatively phototropic

CC BY NC ND

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

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Explain why plant shoots are negatively gravitropic

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Explain why plant shoots are negatively gravitropic

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

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Explain why plant roots are positively gravitropic

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Explain why plant roots are positively gravitropic

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

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

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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

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What are gibberellins? (higher)

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What are gibberellins? (higher)

Plant hormones that control germination and flowering. They also increase stem length in plants.

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How do gibberellins trigger germination? (higher)

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How do gibberellins trigger germination? (higher)

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

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How do gibberellins increase stem length in plants? (higher)

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How do gibberellins increase stem length in plants? (higher)

They stimulate cell division and elongation in the stem

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

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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.

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What plant structure naturally releases ethene? (higher)

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What plant structure naturally releases ethene? (higher)

Ripening fruit

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

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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.

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