WJEC England Biology GCSE

4.4 - Plant hormones

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?

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Phototropism

Gravitropism

Define phototropism

Define phototropism

A plant's growth response to light

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

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

Define gravitropism

Define gravitropism

A plant's growth response to gravity

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

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 how plant tropisms increase the chance of survival

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

What are auxins?

What are auxins?

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

Where are auxins produced?

Where are auxins produced?

Root and shoot tips

How do auxins affect plant shoots?

How do auxins affect plant shoots?

They stimulate growth in plant shoots

How do auxins affect plant roots?

How do auxins affect plant roots?

They inhibit growth in plant roots

How are auxins affected by light?

How are auxins affected by light?

Light inhibits the effect of auxins

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

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

Explain why plant shoots are negatively gravitropic

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

Explain why plant roots are positively gravitropic

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

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

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

What are gibberellins? (higher)

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

How do gibberellins trigger germination? (higher)

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

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

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

They stimulate cell division and elongation in the stem

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.

What plant structure naturally releases ethene? (higher)

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Ripening fruit

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.