

Human Impact on Resources - Questions by Topic

Q1.

In the 18th century, William Withering trialled the use of an extract of foxglove plants to treat a heart condition.

Give **four** reasons why a contemporary drug testing protocol is an improvement on the trial used by William Withering.

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(Total for question = 4 marks)

Q2.

In a drug trial, people with a heart condition were given one of three drug treatments. The table shows the recorded improvement in their condition for each of the three treatments.

Treatment	Concentration of drug / mg	Recorded improvement / arbitrary units
1	0	18.8
2	400	24.8
3	600	30.9

It was concluded that the drug treatment improved the condition of the patients.

Analyse the data to comment on this conclusion.

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(Total for question = 3 marks)

Q3.

The photograph below shows the shiny nematolepis plant (*Nematolepis wilsonii*), which became extinct in the wild. This plant was thought to be extinct as a result of bush fires in South East Australia during 2009.

It had been found in only one site in the wild and this site was burnt to a depth of over one metre. This destroyed seeds that were in the soil.



Magnification $\times 1$

(a) (i) State what is meant by the term **species richness**.

(1)

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(ii) Suggest what effect the extinction of the shiny nematolepis plant would have on species richness in South East Australia.

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(b) Suggest why the shiny nematolepis plant was considered to be an endemic species before the bush fires of 2009.

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(c) Shiny nematolepis seeds had already been stored at the Millennium Seed Bank at Kew. These seeds were used to restore this plant species and to ensure its survival.

(i) Explain how these seeds were selected for storage in the seed bank.

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(ii) Describe the conditions used for the storage of seeds in seed banks.

Explain why seeds are stored in these conditions.

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(Total for question = 9 marks)

Q4.

Medicinal drugs undergo clinical trials before they are licensed to be used.

In January 2016, a clinical trial of a different drug involved 128 healthy volunteers aged 18 to 55. In this trial, different doses of the drug were given to 90 of these volunteers and the others were given a placebo.

Six people, who were given the drug, became ill and had to be treated in hospital.

(i) Explain why healthy volunteers were given different doses of the drug or a placebo.

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(ii) The trial tested increasing the dose of the drug. The six people who fell ill were the first to receive higher doses over the course of several days.

Which of the following is the correct ratio of those who took the drug to those who fell ill?

(1)

- A** 14 :1
- B** 15 :1
- C** 18 :1
- D** 21 :1

(iii) Compare and contrast this drug testing protocol with that used by William Withering he tested digitalis soup.

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(Total for question = 6 marks)

Q5.

Svalbard Global Seed Vault (SGSV) is a seed bank. It keeps seeds from almost 4000 species of plants, focussing on food crops such as wheat, rice and maize.

SGSV keeps seeds from more than 865 000 varieties of plant, including 200 000 varieties of wheat and rice. Some of these varieties are rare or extinct in the wild.

Since 2004, more than 410 million dollars have been spent on SGSV and other seed banks around the world.

However, it is estimated that 75% of global crop diversity is not stored in international seed banks.

Critics argue that many crop varieties stored in SGSV are not actually used for food, and that the money would be better spent supporting farmers who are growing food crops.

Justify the continued funding of SGSV.

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(Total for question = 3 marks)

Q6.

The photograph below shows seed pods of a Canola plant (*Brassica napus*). Canola is a plant grown as a crop because the seeds are rich in oil. The extracted oil is used in cooking and as a sustainable fuel.



Magnification $\times 0.1$

(a) Suggest why the production of oil from Canola seeds can be described **sustainable**.

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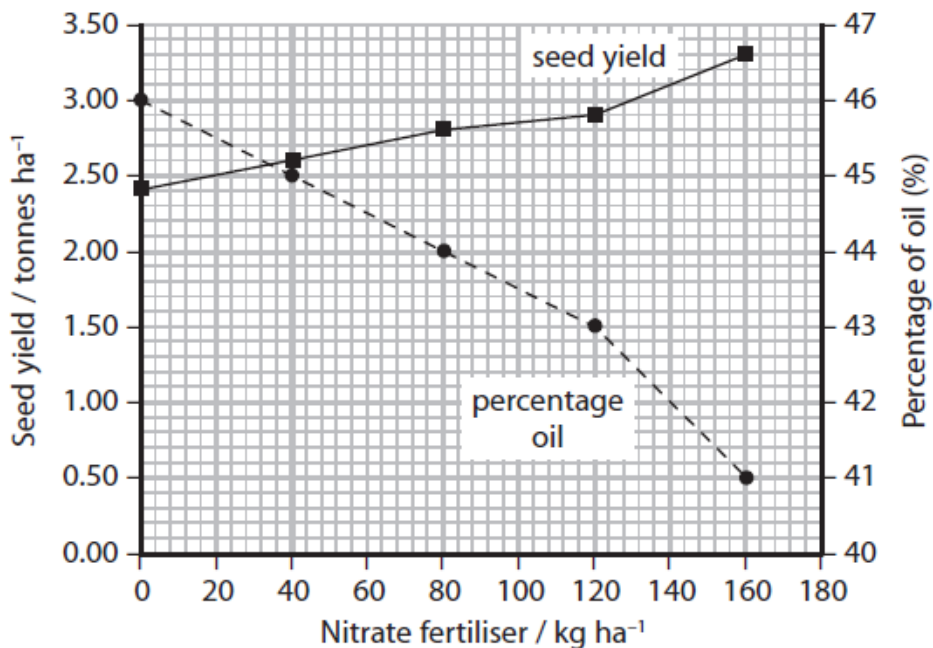
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(b) Farmers provide the plants with fertiliser containing nitrate ions.

Explain the importance of nitrate ions for the growth of plants.

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(c) Scientists carried out an investigation into the effect of nitrate fertiliser on the yield.

The graph below shows the results of this investigation.



(i) Place a cross in the box next to the correct word or words to complete the following statement.

The mass of nitrate fertiliser added and the percentage of oil produced show

(1)

- A** a negative correlation
- B** no relationship
- C** a positive correlation
- D** a proportional relationship

(ii) Using information in the graph, calculate the percentage change in seed yield when the level of nitrate fertiliser is increased from 0 to 160 kg ha⁻¹.

Show your working.

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(iii) Suggest how the scientist could have ensured that this investigation was valid.

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(Total for question = 12 marks)

Q7.

Textiles are often made from plant fibres. The use of plant fibres is more sustainable than the use of synthetic fibres made from fossil fuels.

Give reasons why the use of fibres from plants is sustainable.

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(Total for question = 2 marks)