

Food production: crop plants: practice questions

6 questions • 19 marks • mark scheme at the back

For Pearson Edexcel International GCSE Biology 4BI1 and Science (Double Award) 4SD0. **Biology only** is not in the Double Award and is only examined on Paper 2.

Name

Total / 19

- 1** Which change in a glasshouse is most likely to increase the rate of photosynthesis if carbon dioxide is the limiting factor? **[1 mark]**

- A. ☐ Increasing the carbon dioxide concentration
B. ☐ Decreasing the temperature
C. ☐ Shading the glass to reduce the light
D. ☐ Adding more oxygen

- 2** State two ways in which a polythene tunnel can increase the yield of a crop. **[2 marks]**

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- 3** Explain how adding fertiliser to the soil can increase the yield of a crop. **[3 marks]**

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- 4** Farmers can use a pesticide or biological control to reduce the number of aphids on a crop. Give two advantages and two disadvantages of using a pesticide instead of biological control. **[4 marks]**

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- 5** The table shows the mean mass of tomatoes grown on one plant in a glasshouse with and without extra carbon dioxide. Calculate the percentage increase in mass with extra carbon dioxide. **[3 marks]**

Mean mass of tomatoes per plant (practice data)	
Carbon dioxide	Mass of tomatoes per plant in kg
Normal air	4.0
Extra carbon dioxide	5.0

Answer =

- 6** A farmer wants to grow a large crop of lettuces. Describe and explain how the farmer could use a glasshouse and other methods to increase the yield. **[6 marks]**

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

A A (1)

2. [2]

- traps heat / keeps plants warm so faster growth (1)
- protects from pests / wind / frost / heavy rain (1)
- allow lets the growing season be extended (1)
- Max 2

3. [3]

- fertilisers contain mineral ions / nitrates (1)
- nitrate is used to make protein (1)
- so plants grow faster / bigger, giving a higher yield (1)
- ignore plant food

4. [4]

- advantage: kills pests quickly / more effective (1)
- advantage: easy to apply over a large area (1)
- disadvantage: kills non-target organisms / harmless insects (1)
- disadvantage: pests may become resistant / may build up in food chains / pollute water (1)
- allow other correct points

5. [3]

- increase = $5.0 - 4.0 = 1.0$ kg (1)
- $(1.0 \div 4.0) \times 100$ (1)
- 25% (1)
- correct answer with no working gains 3 marks
- reject $(1.0 \div 5.0) \times 100 = 20\%$

6. [6]

Level 3 5-6	Detailed description and explanation of at least three methods, linking each to a clear reason for increased yield, with correct use of terms such as photosynthesis, limiting factor, mineral ions and pests.
Level 2 3-4	Describes at least two methods and gives some explanation of how they increase yield, with some use of scientific terms.
Level 1 1-2	Identifies one or two methods with little or no explanation.

Indicative content

- glasshouse traps heat; higher temperature raises the rate of photosynthesis (enzyme activity) up to the optimum
- added carbon dioxide increases photosynthesis if limiting, so more glucose for growth
- extra light lengthens photosynthesis time
- protection from wind, frost and pests reduces crop loss
- fertiliser supplies nitrates for protein, so faster growth
- pesticide or biological control reduces damage by pests, so less crop is eaten
- a limiting factor must be dealt with first, or extra of another factor has no effect