

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: 5

1 In many countries people rely on bananas for food. Black sigatoka is a disease of banana plants.

It is caused by a fungus.

(a) Explain how the food security/growth of bananas could be improved:

(i) by using fungicide.

[1]

(ii) by using selective breeding.

[3]

(b) Scientists have been investigating the conditions needed for the fungus to grow.

They compiled this data.

| Conditions needed for fungus to grow | | |
|---|--------------------------|--------------------------------|
| | Temperature in °C | Percentage humidity (%) |
| Grows well | 25 - 28 | >90 |
| Some growth | 20 – 25 or 28 - 35 | 90 - 80 |
| Will not grow | < 20 or >35 | <70 |

Write in the boxes how well the fungus will grow in these conditions

| | |
|-----------------------------|--|
| 25 °C and a humidity of 85% | |
| 27 °C and a humidity of 92% | |

[2]

(c) Scientists have tried to predict the effect of climate change on the growth of the fungus.

They have used four different predictions for how the climate might change, **A**, **B**, **C** and **D**.

They then tried different ways of calculating where the fungus cannot grow.

Their results are shown in the table.

| Percentage area of the world where fungus cannot grow (%) | | | | |
|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Climate model | 1 st calculation | 2 nd calculation | 3 rd calculation | 4 th calculation |
| A | 87.6 | 87.9 | 87.7 | 87.8 |
| B | 88.4 | 88.6 | 89.0 | 88.8 |
| C | 91.1 | 91.5 | 91.4 | 91.3 |
| D | 88.4 | 88.9 | 89.5 | 89.2 |

(i) Which climate model produces the lowest **range** of results in the four calculations?

Choose from **A**, **B**, **C** or **D**.

[1]

(ii) At present the fungus **cannot** grow over 86.4% of the world.

What do the calculations predict about the effect of climate change on the fungus?

[1]

- (d) Scientists are developing a genetically engineered banana plant.
This would be resistant to black sigatoka.
Look at the newspaper headline from an African newspaper.

Trouble at the genetic research station

Police have been called to a research station.
They are needed to guard the genetically modified plants.
This is because people have been trying to steal the plants to
grow themselves.

In Europe, police have been used to guard genetically engineered crops from protesters.

Suggest why the protesters in Europe want to destroy the crops and why the response in Africa is so different.

[2]

Total Marks for Question Set 5: 10

OCR

Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge