

WJEC (Eduqas) Biology GCSE

Topic 6.4 Some of the
biological challenges of
increasing food yields using
fewer resources

Questions by Topic - Mark
Scheme

Sub-section			Mark	Answer	Accept	Neutral answer	Do not accept
1.	(b)	i	1	Japan;			
		ii	1	9;			
		iii	2	number of cases of blindness decreases/ no blindness/ prevents blindness; Because {they / both groups} are now {reaching RDA/ having enough vitamin A}; 2nd mark linked to 1st	plenty of vitamin A/ stops vitamin A deficiency		more vitamin A
	(c)		2	health concerns from <u>eating</u> GM foods/ <u>eating</u> GM crops {will harm them/ have side effects}; concerns about GM organisms breeding with native organisms;	eating GM crops will poison them/ they do not if it is safe to eat		

2.	Question			Marking details	Marks available						
					AO1	AO2	AO3	Total	Maths	Prac	
	2	(a)	(i)	10.4 = 2 marks Incorrect answer but correct figures taken from graph = 1 mark 6.3 + 4.1		2		2	2		
			(ii)	1987			1	1			
			(iii)	<ul style="list-style-type: none"> Sewage dumped at the '12 mile' dump site would {drift/wash up on/return} to {land/coast/beaches/ shore} (1) If answer doesn't refer to 12 mile or 106 mile sites then assume answer is referring to 106 mile site Reject New York/ New Jersey (Movement of buoys shows that) sewage dumped at the '106 mile' dump site does not return to {land/coast/beaches} (1) 			1	2			

3.	Question			Marking details	Marks available						
					AO1	AO2	AO3	Total	Maths	Prac	
		(b)		Any 3 (x1) from: 1. (Increased) competition for light/ light is blocked (1) 2. some {algae/ plants} (start) dying (1) 3. {bacteria/ microbes/ decomposers} {decomposing / rotting/ breaking down} dead plants (1) 4. use up oxygen for respiration (1) 5. arctic char suffocate/ owtte (1)	3			3			

4.	Question	Marking details	Marks Available												
	(a)	Kills the weeds/ plants (reject animals/ pests); Reject stop weeds growing that compete (with the crop)/ {more room/ nutrients/ light} for crop;;	2												
	(b) (ii)	<table border="1"> <thead> <tr> <th>Argument</th> <th>✓ or ✗</th> </tr> </thead> <tbody> <tr> <td>Increased crop yield</td> <td>given</td> </tr> <tr> <td>Less herbicide used</td> <td>given</td> </tr> <tr> <td>Reduced biodiversity</td> <td>✗</td> </tr> <tr> <td>Cheaper food</td> <td>✓</td> </tr> <tr> <td>Long term effects unknown</td> <td>✗</td> </tr> </tbody> </table>	Argument	✓ or ✗	Increased crop yield	given	Less herbicide used	given	Reduced biodiversity	✗	Cheaper food	✓	Long term effects unknown	✗	1
Argument	✓ or ✗														
Increased crop yield	given														
Less herbicide used	given														
Reduced biodiversity	✗														
Cheaper food	✓														
Long term effects unknown	✗														
		All 3 correct for 1 mark;													
	(iii)	Any two from, <u>Cost of extra</u> herbicide/ farmers have to <u>buy extra</u> herbicide; Competition from (resistant)soya/ description of competition; Herbicide kills maize;	2												

5.	Question	Marking details	Marks Available
Q.5	(a)	10;	[1]
	(b)	4.5; 3.2;	[2]
	(c)	Any two from: Competition for/ shortage of/ less/ running out of: light; water; nutrients/ minerals; space/ room; carbon dioxide;	[2]

Question Total [5]

6.

Marking details

Marks Available

Indicative content

Soya has increased rate of photosynthesis because of inserted bacterial gene. Therefore increased growth. Yield is increased. Soya withstands/ resistant to herbicide because of inserted bacterial gene. Weeds are killed. Reduces competition for resources (minerals/light/space/water/CO₂).

5-6 marks

The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.

3-4 marks

The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.

1-2 marks

The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.

0 marks

The candidate does not make any attempt or give a relevant answer worthy of credit

Question 6 Total

[6]

7.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	1	Less objection/ more agreement / more positive /more accepted /more popular;			Crop increased
(c)	3	Any three from <ul style="list-style-type: none"> • Crop yield increases with use of GM; • GM crop not 100% resistant; • GM plants not resistant to sap sucking insects/ sap sucking insects are not affected; • GM effective against leaf eating insects/ GM plants are resistant to leaf eating insects; • Less <u>total</u> insecticide used with GM crops/ less insecticide used to control leaf eating insects with GM crops; • A correct statement relating to data in table; 			