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RECOGNISING ACHIEVEMENT

GCSE

Environmental and Land Based Science

General Certificate of Secondary Education **B491/02**

Mark Scheme for June 2010

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Question			Expected Answers	Marks	Additional Guidance
1			nitrate – stunted growth with yellow leaves phosphate – purple leaves and small roots potassium – yellow leaves with dead spots	2	2 marks for all three correct; 1 mark for one correct
2			**B** 14	1	
3			nucleus; ovule; fruit	3	
4			**A** decreases soil pH	1	
5			rhizome; clumps are split and then cut into sections	2	If all 4 organs are included in the table award 1 mark for the correct method of propagation for rhizomes
6			**C** Improve the crumb structure of the soil	1	

7			any three from: humidity – too low they dry out / too high they rot; temperature – too high they can suffer disease / too low they could freeze / rot / cool to slow down microbial action; pests – (sealed containers) to prevent pests entering; low oxygen / high carbon dioxide – less respiration; dark – to prevent them sprouting removal of rotten carrots - to stop disease from spreading OWTTE clean container / sterilise carrots – to prevent disease	3	Reject goes off Accept right temp/humidity Accept any reasonable suggestion for how to stop pests entering Reject controlled atmosphere without qualification
8			wind pollination; more likely that pollen transfers from one plant to the next / plants are closer together so are easier to pollinate OWTTE	2	Accept blown Accept Reference to the direction of the wind Reject any reference to seeds Reject if any reference to insects
9	**a**		8	1	
	b		256	1	ecf
10	**a**		an increase in spacing leads to a decrease in yield;	1	
	b		fewer weeds (so less competition) greater <u>number</u> of carrots planted	2	Accept amount

11			**C** 155.7	1	
12			B: it contains high P / good for root growth	2	
13	**a**		what an organism looks like;	1	
	b		depends on its genotype / genes	1	
14			to catch pollen	1	
15			F2 GG will produce all GG green offspring; F2 gg will produce all gg yellow offspring; F2 Gg will produce 3:1 ratio of green:yellow	3	
16			reduces transpiration / less water lost so leaf (cells) turgid / not wilted; leaves absorb more light for photosynthesis / stomata open allowing CO_2 in for photosynthesis; high humidity encourages fungi; prevents scorching	2	do not accept just 'dry out' Reject diseases can't spread

17			any two reasonable suggestions: species / type of plants; number / quantity of individuals; germination / date; planting date; harvest date; pest / disease; yield / size / how much grown / how fast grown grown from seeds / cuttings / F1 / F2	2	Reject any reference to growing conditions Reject healthy
18			any three from: temperature probe will enable the heater to be switched off when it reaches optimum temperature to save electricity / allows maximum photosynthesis; light sensor will enable lights to be switched off when natural light is sufficient / increase the rate of photosynthesis; humidity probe will allow mist propagators to be switched off to conserve water / to maintain turgidity for maximum photosynthesis; use of ICT reduces labour costs;	3	minimum response would be optimum conditions produce healthier growth so higher prices. Reject reference to how ICT can be used to maximise conditions for growth
			Total	**36**	

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