



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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AGRICULTURE

0600/03

Paper 3

October/November 2007

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use a soft pencil for any diagrams or graphs.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total	

This document consists of **15** printed pages and **1** blank page.



- 1 (a) Fig. 1.1 shows a recently settled family farm. Draft oxen are kept together with cattle for meat and milk. Maize is grown with Leucaena – an evergreen, nitrogen fixing tree.

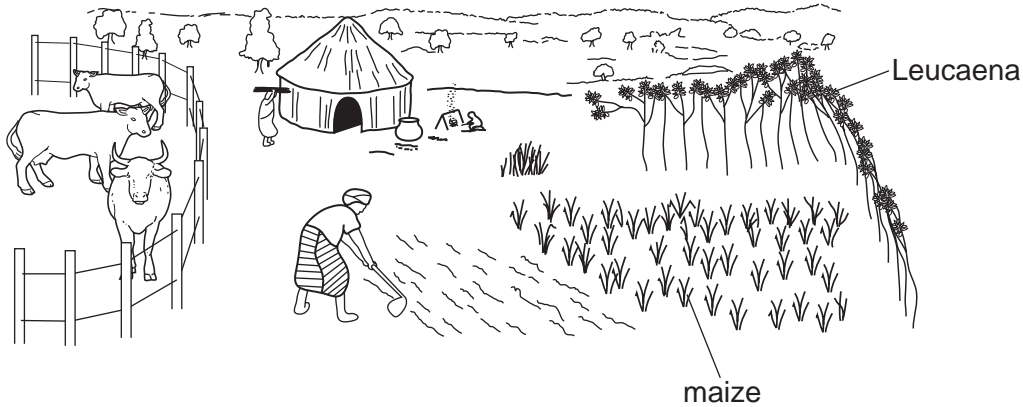


Fig. 1.1

- (i) To which group of plants does Leucaena belong?

.....

[1]

- (ii) Explain how Leucaena and plants like them improve soil fertility.

.....

[2]

- (b) As the population of the settlement increases more land is used for huts and less for farming.

Suggest **two** ways by which the yield from the crops can be maintained on less land.

.....

[2]

- (c) Describe ways in which intensive farming may damage the environment.

.....

[4]

[Total 9]

- 2 (a) Fig. 2.1 shows a stack of soil sieves used to separate the parts of a soil sample. Soil needs to pass easily through the mesh when the sieves are shaken.

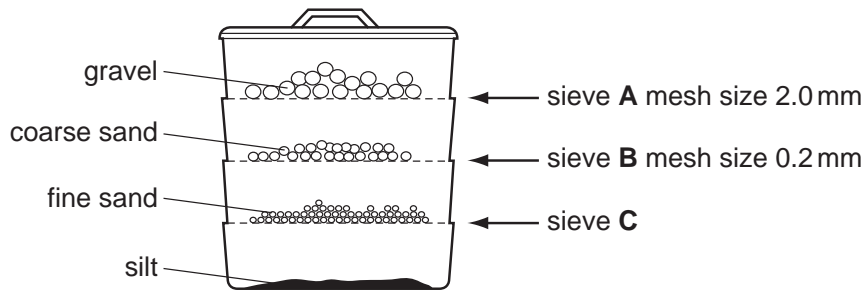


Fig. 2.1

Name the soil type from which the soil sample in Fig. 2.1 was taken.

..... [1]

- (b) Describe **two** effects a mulch of FYM or kraal manure could have on a sandy soil.

.....

.....

..... [2]

- (c) Using FYM or kraal manure can introduce seeds and weeds to the soil.

Discuss the advantages and disadvantages of using chemicals to control weeds in a garden plot.

.....

.....

.....

.....

..... [4]

[Total 7]

3 (a) Describe a method for finding the pH value of a soil sample.

.....

 [3]

(b) Table 3.1 shows the effect of pH on the availability of nutrients to a plant. The shaded areas indicate the soil pH range at which nutrients are readily available.

Table 3.1

nutrients	pH	4.0	5.0	6.0	7.0	8.0	9.0
sulphur							
calcium							
potassium							
phosphorus							
nitrogen							

(i) Over which ranges of pH would there be little point applying a N P K fertilizer?

.....
 [2]

(ii) Suggest why nutrients are unavailable to plants at a low pH.

.....

 [2]

[Total 7]

4 (a) (i) For a named root crop state how to recognise it is ready for harvest.

name of root crop

.....
..... [1]

(ii) State **one** environmental condition needed for the storage of root crops.

..... [1]

(b) Harvested crops can be stored in buildings such as the one shown in Fig. 4.1.

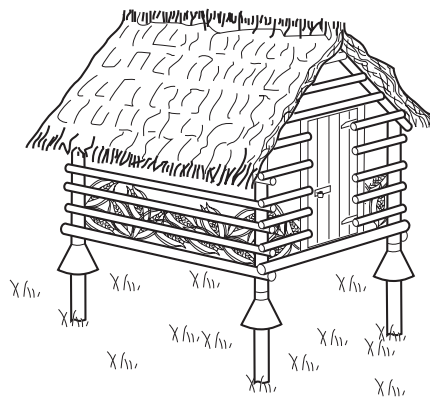


Fig. 4.1

(i) What features must a building have to store crops successfully?

.....
.....
.....
..... [3]

(ii) Buildings use different materials in their construction, e.g. thatch, iron, wood, mud, bricks, and cement blocks.

What factors should be taken into account when deciding on which materials to use?

.....
.....
.....
..... [4]

[Total 9]

5 (a) (i) What causes crop plants to wilt?

..... [1]

(ii) Explain the processes that take place in a plant that result in wilting.

.....

 [2]

(b) State **two** benefits to the plant of transpiration.

1
 2 [2]

(c) Suggest **one** adaptation that plants growing in dry grassland (veld) have to reduce water loss.

..... [1]

(d) In the veld there is continuous competition between grass plants and woody bushes. In the absence of farming activity bushes are dominant and encroach on the grassland.

Fig. 5.1 shows the effects on this process of grazing goats and annual burning.

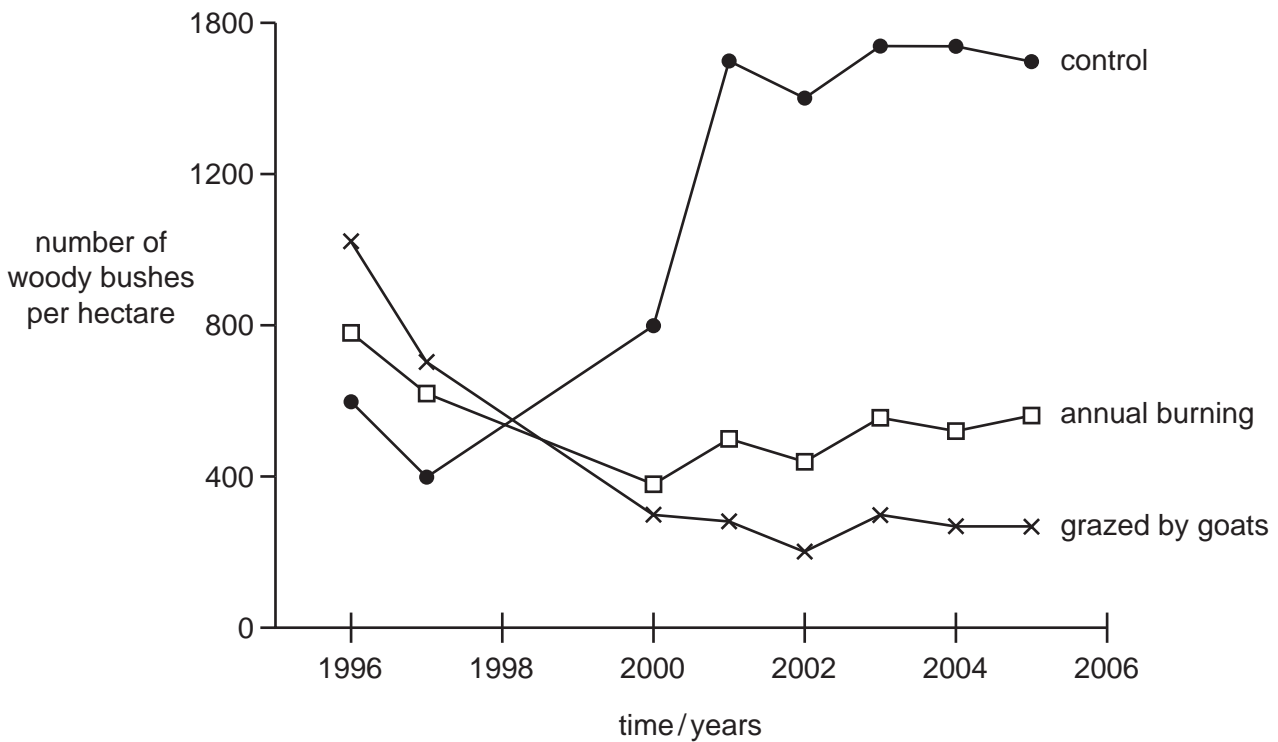


Fig. 5.1

(i) What conclusions can be made about bush density from 1996 to 2006?

.....
.....
..... [2]

(ii) Suggest reasons to explain the difference between the densities of bushes that resulted after goat grazing and burning.

.....
.....
.....
..... [2]

[Total 10]

- 6 (a) Fig. 6.1 shows the digestive system of a donkey.

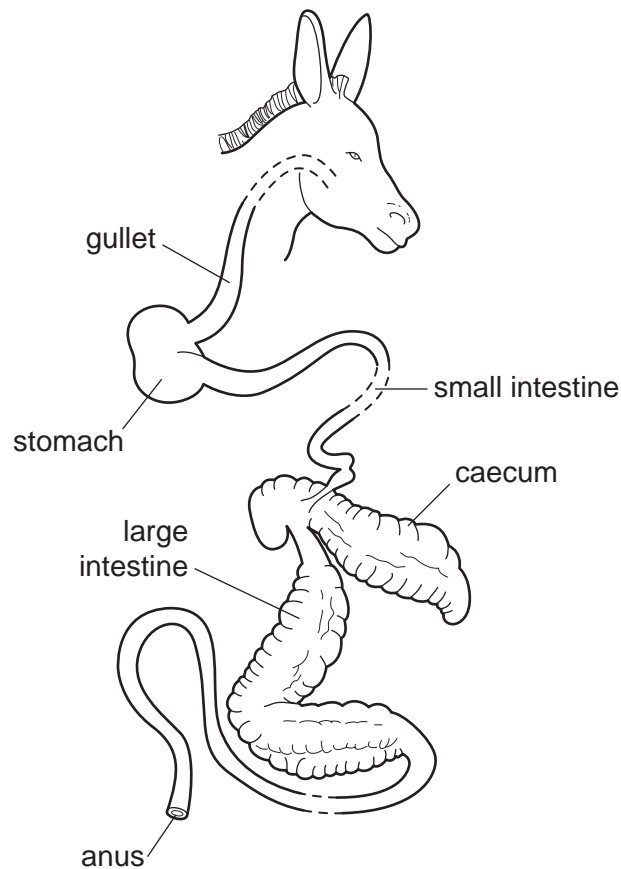


Fig. 6.1

- (i) Is the donkey a ruminant or a non-ruminant?

Use the diagram above to give a reason for your answer.

.....

.....

- (ii) Label on the diagram, with an **E**, where enzymes are active in digestion.

- (iii) Label on the diagram, with an **M**, where microorganisms are active in digestion. [3]

- (b) Young donkeys, before weaning, eat some of their mothers' dung.
Suggest a reason for this activity.

.....

..... [1]

(c) Explain how the basic ration given to donkeys should be supplemented for:

1 a young newly weaned donkey;

.....

2 an adult working donkey.

.....
 [3]

(d) The pie charts, Fig. 6.2, show the content of lick mixtures used for feeding cattle in Namibia.

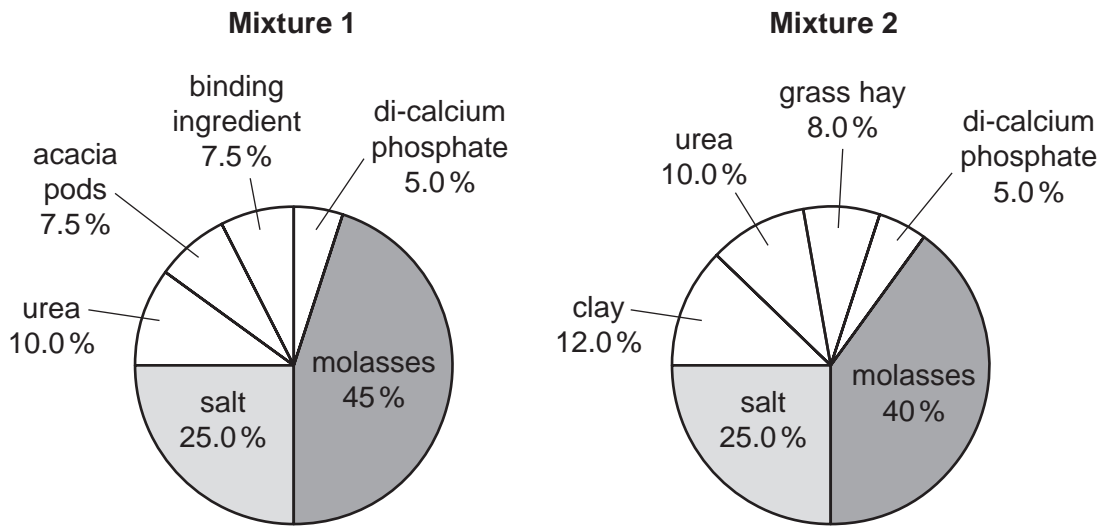


Fig. 6.2

(i) State **two** differences between the two licks.

.....
 [2]

(ii) Suggest a function for the clay in **Mixture 2**.

..... [1]

[Total 10]

7 (a) What is meant by the following:

1 fertilisation

.....

2 A I (artificial insemination)

.....
 [2]

(b) Fig.7.1 shows the inheritance of horns in two generations of sheep.

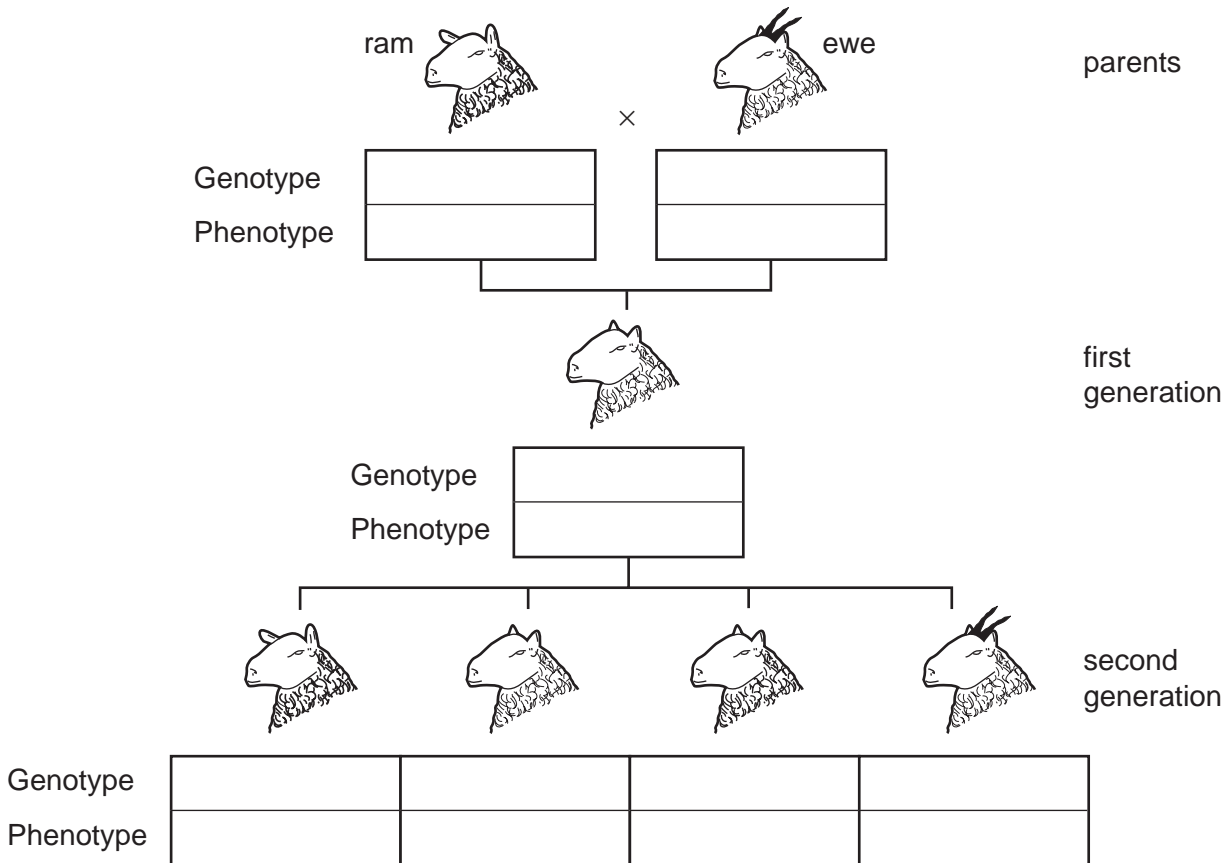
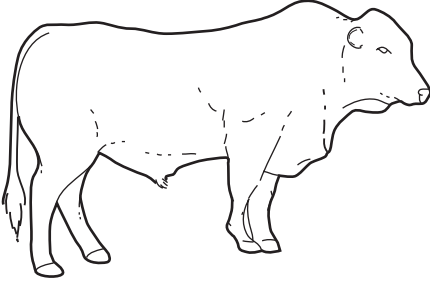


Fig. 7.1

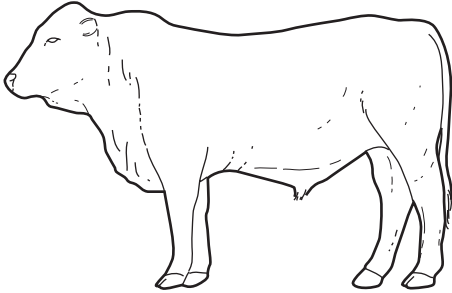
Indicate for each individual on the diagram its genotype, using appropriate symbols, and its phenotype. [4]

(c) Fig. 7.2 is an advert for bulls available for breeding.

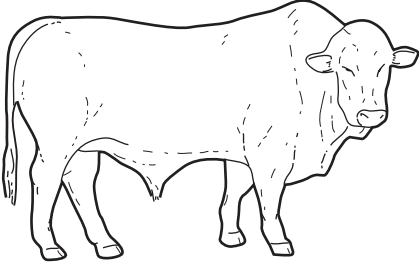
Auction information



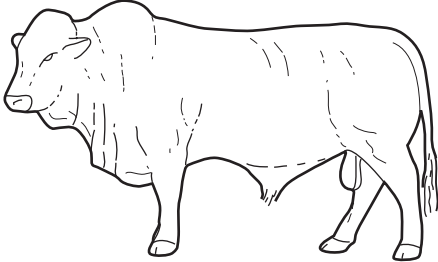
A is good looking with muscling detail, good masculinity and balance.



B is a top young bull with excellent dark skin and good hair quality.



C is a dark bull with great depth, a wide muzzle and high sex-drive.



D carries plenty of meat and has exceptional masculinity, he has good muscling and is early-maturing.

Fig. 7.2

(i) Which bull would you use to produce calves for the meat market?

.....

Give reasons for your answer.

.....
.....
..... [2]

(ii) Suggest additional information that might have been provided which would be useful for a breeder to know.

.....
..... [1]

[Total 9]

8 (a) Fig. 8.1 shows a sweet potato plant growing on the ground.

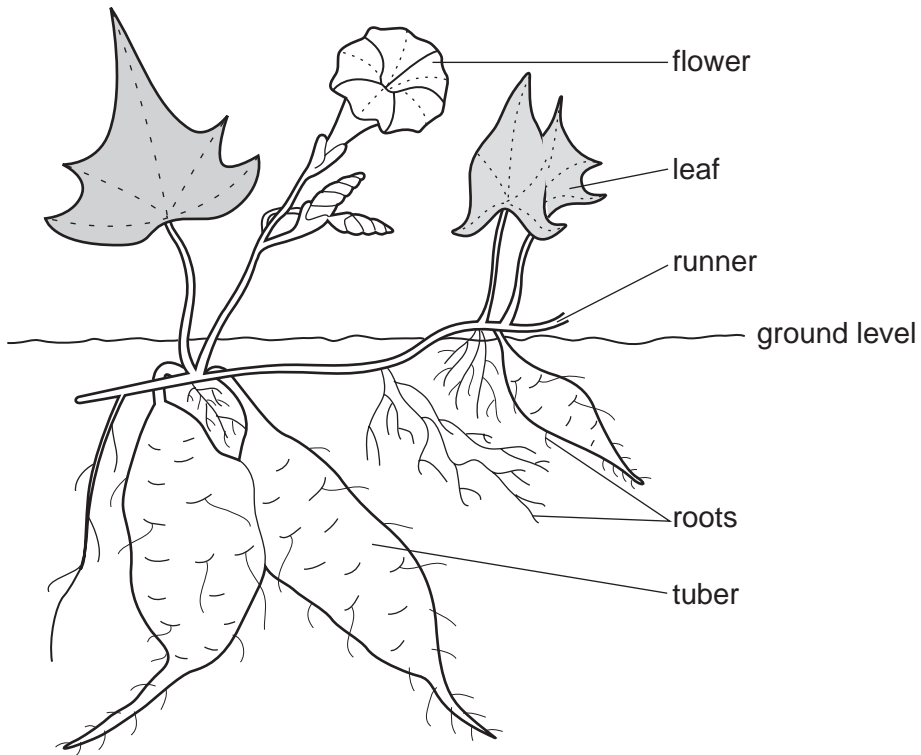
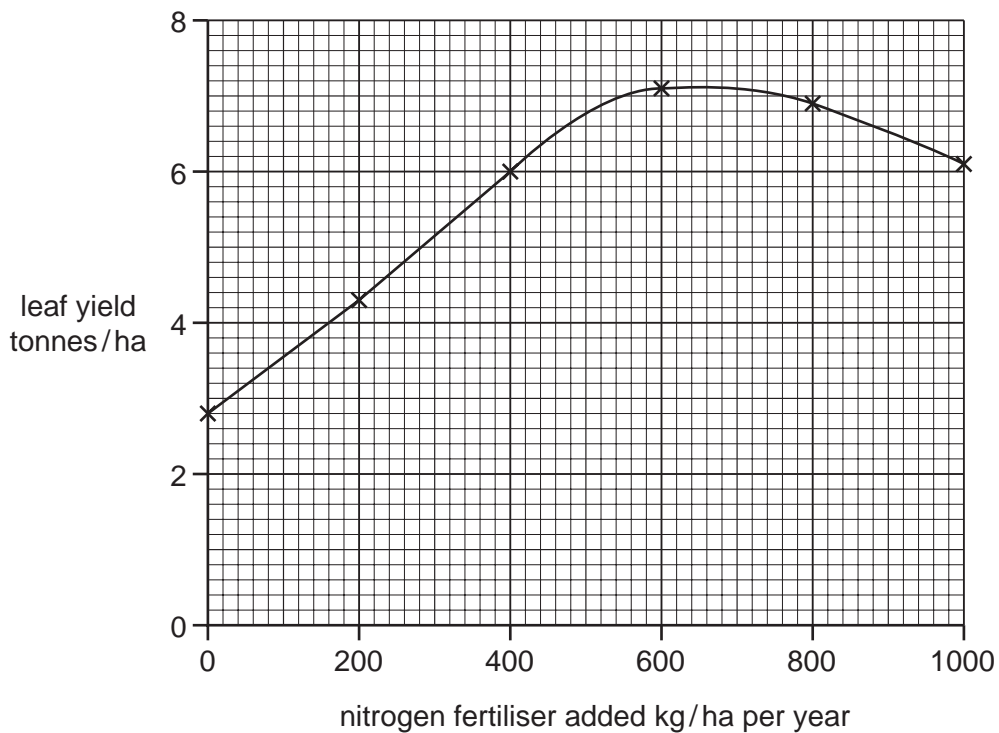


Fig. 8.1

In Sierra Leone this crop is grown for leaf production. The graph compares the relationship between leaf yield with the amount of nitrogen fertiliser added to the soil.



(i) What principle does the graph illustrate?

.....

Explain your answer.

.....

..... [2]

(ii) Explain fully how the use of a nitrogen fertiliser produces better growth of leaves.

.....

.....

.....

..... [2]

(b) Describe how the products of photosynthesis produced in the leaves are stored in the tubers.

.....

.....

.....

.....

..... [3]

(c) Suggest a method of growing the sweet potato that could result in better leaf development and tuber growth.

Explain why the system would achieve improvement.

.....

.....

..... [2]

[Total 9]

9 (a) State **two** benefits that non-grass species could provide in pasture.

1

2

..... [2]

(b) The stocking rate is the amount of land available for one livestock unit (LSU).
One livestock unit = a cow or 6 sheep or goats.

(i) State what is meant by carrying capacity.

.....

.....

..... [2]

(ii) In south east Botswana the stocking rate is 0.2 ha / LSU and the carrying capacity is 12 ha / LSU.

Is this area of Botswana overstocked or understocked?

.....

Give a reason for your answer.

.....

..... [1]

(c) Overstocking can result in the spread of animal disease.

(i) Describe the services provided by the veterinary organisation in your area that can be used to prevent disease.

.....

.....

..... [2]

(ii) Explain in what circumstances you would use:

1 antibiotics

.....
.....

2 disinfectants

.....
.....

3 fungicides

.....
.....

[3]

[Total10]

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