



For Supervisor's use only

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90174



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Horticultural Science, 2003

90174 Describe plant structure, processes, propagation, and plant management practices

Credits: Six

9.30 am Friday 28 November 2003

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

If you need more space for any answer, use the pages provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–16 in the correct order and that none of these pages is blank.

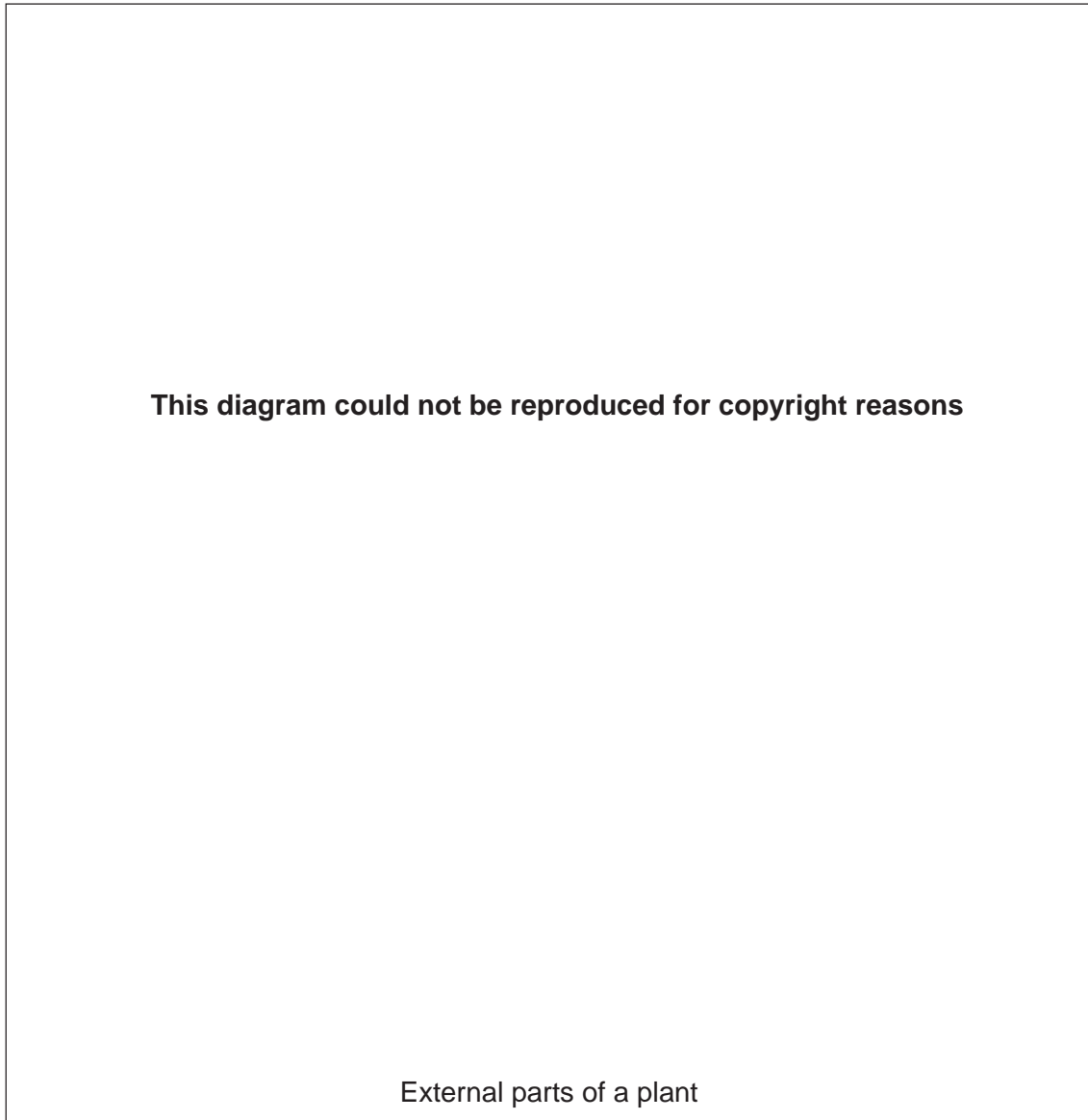
YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Achievement Criteria			<i>For Assessor's use only</i>		
Achievement		Achievement with Merit		Achievement with Excellence	
Identify and describe the structure and function of the parts of a plant, and essential plant processes.	<input type="checkbox"/>	Identify and describe the structure and function of the parts of a plant, and essential plant processes.	<input type="checkbox"/>	Identify and describe the structure and function of the parts of a plant, and essential plant processes.	<input type="checkbox"/>
Describe methods of propagation.	<input type="checkbox"/>	Describe methods of propagation and explain the conditions necessary for the successful propagation of plants.	<input type="checkbox"/>	Describe methods of propagation and explain the conditions necessary for the successful propagation of plants.	<input type="checkbox"/>
Describe management practices necessary to maintain healthy plant growth.	<input type="checkbox"/>	Explain management practices and conditions necessary to maintain healthy plant growth.	<input type="checkbox"/>	Explain management practices and conditions necessary to maintain healthy plant growth.	<input type="checkbox"/>
				Evaluate the effectiveness of plant propagation and plant management practices.	<input type="checkbox"/>
Overall Level of Performance (all criteria within a column are met)					<input type="checkbox"/>

You are advised to spend 40 minutes answering the questions in this booklet.

QUESTION ONE: Plant Structure, Function and Processes

Refer to the diagram below that shows some external parts of a plant and answer the questions that follow.



[Source: Adapted from: Life of Plants, Martin Hanson, Longman Paul]

- (a) Identify the parts of the plant indicated by the labels **A**, **B** and **C**. Use words from the list provided below.

Word List: flower, lateral bud, stem, roots, petiole, node

- A.** _____
- B.** _____
- C.** _____

(b) Describe the function of TWO of the three plant parts you identified in Question 1 (a).

(i) Name of chosen plant part:

Function of plant part:

(ii) Name of chosen plant part:

Function of plant part:

(c) Plants are able to make their own food in their leaves. Give the name of this plant process and write a word equation to describe this process.

(i) Name of plant process:

(ii) Word Equation:

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(b) The grower collected the seeds produced by the new hybrid rose and stored them in a container in a cool, dry place until ready for planting. Explain why the seeds remain viable if stored in a cool and dry place.

(i) Why the seeds remain viable when kept cool.

(ii) Why the seeds remain viable when kept dry.

(c) In early spring, the grower prepared a seed bed to sow the new hybrid rose seeds.

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Explain TWO **environmental conditions** required for successful germination.

Environmental Condition 1:

Why this condition is required for successful germination.

Environmental Condition 2:

Why this condition is required for successful germination.

(e) Explain TWO conditions necessary for successful propagation using this method.

Condition 1:

Why this condition is required for successful propagation.

Condition 2:

Why this condition is required for successful propagation.

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QUESTION THREE: Plant Propagation

Grape vines are propagated by grafting scions of different cultivars onto different rootstocks. A scientist has developed three new rootstocks for propagating Cabernet Sauvignon cultivars. Table One lists the characteristics of these rootstocks.

TABLE ONE

New rootstocks	Characteristics
Z501	<ul style="list-style-type: none"> • Suited to light soils of high fertility. • High vigour. • Susceptible to the disease phylloxera. • Suitable for most cultivars.
Z502	<ul style="list-style-type: none"> • Suited to heavy soils of high fertility. • Low vigour. • Resistant to the diseases phylloxera and shanking. • Suitable for most cultivars.
Z503	<ul style="list-style-type: none"> • Suited to light soils of low fertility. • Low vigour. • Resistant to the disease phylloxera. • Not suitable for Chenin Blanc or Gewürztraminer cultivars.

Table Two lists information on Cabernet Sauvignon grapevines.

TABLE TWO

Grapevine requirements	Information
Water	<ul style="list-style-type: none"> • Has deep root system and moderate water needs. • Good drought tolerance.
Soil	<ul style="list-style-type: none"> • Moderate tolerance of wet soils in winter, low tolerance in summer. • Tolerant of many soil types, provided they are deep and well drained. • Generally light soils are preferred and those with low fertility. This makes canopy management easier due to less vegetative growth.
Nutrients	<ul style="list-style-type: none"> • Heavy manuring, especially with nitrogen, causes vigorous vegetative growth which is undesirable. • There is often little response to fertilisers except in very low fertility soils.
Pest Resistance	<ul style="list-style-type: none"> • Pest problems serious if phylloxera present. • Powdery mildew in dry climate. Botrytis, downy mildew and rots in wet climate. • Shanking (water berry) may be serious on Cabernet Sauvignon cultivars.

QUESTION FOUR: Plant Management Practices



Fig. 4: Staked tomato plant

- (a) Explain why the method of staking shown in the diagram above is good for healthy tomato growth.

- (b) Explain a method used with tomato plants that directs energy into flower and fruit production but not leaf growth.

COMMON FERTILISERS

Fertiliser Name	NPK Rating	Solubility	Form	Uses
Ammonium Nitrate	33-34-0	50% immediately soluble – 50% slowly soluble	Inorganic	Side dressing Liquid feed Base dressing
Hoof and Horn	13-14-0	Insoluble – slow release	Organic	Base dressing Side dressing
Mono Ammonium Phosphate	12-25-0	Soluble	Inorganic	Liquid feed Side dressing
Bone Meal	0-22-0	Slowly soluble	Organic	Base dressing
Sulphate of Potash	0-0-50	Soluble	Inorganic	Base dressing Side dressing Liquid feed
Rock Potash	0-0-50	Slowly soluble	Organic	Base dressing

Tomatoes go through the following development stages:

- growth
- flowering
- fruiting.

(c) From the information in the table above, which fertilisers would best suit each stage of tomato development? Name one fertiliser for each stage.

(i) Growth:

(ii) Flowering:

(iii) Fruiting:
