

**2007 HSC Notes from
the Marking Centre
Agriculture**

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Published by Board of Studies NSW
GPO Box 5300
Sydney 2001
Australia

Tel: (02) 9367 8111

Fax: (02) 9367 8484

Internet: <http://www.boardofstudies.nsw.edu.au>

ISBN 978 174147 8778

2007729

Contents

Introduction	4
Paper 1	4
Section I	4
Section II	5
Section III	6
Paper 2	7
Optional Research Project	9

2007 HSC NOTES FROM THE MARKING CENTRE

AGRICULTURE

Introduction

This document has been produced for the teachers and candidates of the Stage 6 course in Agriculture. It contains comments on candidate responses to the 2007 Higher School Certificate examination, indicating the quality of the responses and highlighting their relative strengths and weaknesses.

This document should be read along with the relevant syllabus, the 2007 Higher School Certificate examination, the marking guidelines and other support documents which have been developed by the Board of Studies to assist in the teaching and learning of Agriculture.

General Comments

In 2007, approximately 1400 candidates attempted the Agriculture examination.

Teachers and candidates should be aware that the knowledge, understanding and skills developed through the study of all syllabus sections should accumulate to a more comprehensive understanding than may be described in each section separately. Examiners may ask questions that require candidates to respond by integrating their knowledge, understanding and skills developed through studying the entire course, rather than focusing on discrete syllabus 'dot points' and associated 'key words'.

Paper 1

Section I

Question 1

- (a) Better responses stated an input to the farm system that related to their specified product.
- (b) In the better responses, candidates made the relationship between input cost and profitability evident. Weaker responses identified an effect of input costs but could not relate a change in input costs to changes in profitability.
- (c) The best responses outlined practices that could be used by a farmer to cope with an identified risk and linked this practice to a particular market specification. Weaker responses only identified or outlined management practices or market specifications.

Question 2

- (b) Better responses provided a valid reason linking crop rotations to an increased crop yield. Poorer responses provided only vague reasons, for example 'crop rotation increases nutrients'. Some responses incorrectly presumed that canola was a legume.
- (c) Better responses provided detailed reasons to support the use of minimum tillage. These responses demonstrated a clear understanding of the term 'justify'. Weaker responses just

explained the meaning of minimum tillage and failed to support any arguments for its use. The weakest responses did not provide any evidence of the positive uses of minimum tillage.

Question 3

- (a) The better responses stated a measurement such as plant height in cm or dry matter yield as grams/pot.
- (b) The better responses sketched in general terms a method of analysis, such as calculating the mean and standard deviation, graphing and comparing final results. Weaker responses only stated or identified an instrument of analysis such as a mean.

Better responses provided characteristics and features of the design principles and recognised their influence on the reliability of the results. Weaker responses only listed the design principles without relating to them to increasing reliability.

- (c) The better responses identified factors and provided points for and/or against field trials relative to glasshouse trials. Some of these responses included factors such as costs, equipment, environmental variability and pest and disease. The weaker responses listed a factor with a basic outline with no elaboration.

Section II

Question 4

- (a) Better responses identified an increase in growth rates as illustrated by the graph and also identified the stage of growth.
- (b) Better responses showed how a variation in body composition is linked to the sex of the animal.
- (c) Better responses outlined factors that effected the average growth rates of the two pens. They included factors such as genetic variation and environmental factors, then clearly linked these factors to their impact on growth rates. Weaker responses only identified factors affecting growth rates.
- (d) Better responses described management strategies in detail. Some examples of strategies described were supplementary feeding, rotational grazing, establishment of improved pastures. Better responses also clearly linked each strategy to the nutritional requirements of an animal. Weaker responses described or outlined management strategies without establishing any clear link between management strategies and nutrition.

Question 5

- (a)(ii) In the best responses, candidates acknowledged the effect of the weeds on sunflower yield. For example, a reduction in production levels – photosynthetic rate, genetic potential, yield. Better responses outlined one or more factor, for example competition/allelopathy, and then linked this factor to the reduction in production.

- (b) Better responses sketched in general terms methods of plant breeding and the processes involved. These responses addressed the actual processes involved with the methods.
- (c) Better responses discussed advantages and/or disadvantages of factors that need to be considered before replacing the variety currently grown with a new variety. These responses related factors to the adoption of the new variety and included relevant examples.

Section III

Question 6

- (a) Better responses explained the role of a soil nutrient, for example nitrogen as an essential component of chlorophyll, and amino acids. These responses also included a clear link to the effect on production systems.

The weakest responses incorrectly identified factors such as oxygen, pH, organic matter, salt, and water as soil nutrients.

- (b) The best responses provided a clear judgment of the value of each chosen technique. These responses indicated circumstances when certain techniques were most suited. The evaluation of techniques on a comparative basis was also evident in the best responses.

The weaker responses only provided a brief outline or description of the technique and included poor evaluations such as ‘the positives outweigh the negatives for this technique’.

Question 7

- (a) Better responses nominated some roles that governments (at various levels) play in protecting waterways. Some of these roles included legislation to control irrigation, coordinating and funding community groups involved in protection of waterways and activities that make people aware of the impact on waterways of farming and other activities.

Better responses also provided specific details about how these measures protected waterways. Examples such as increased environmental flows, reduced bank erosion and turbidity and reduced nutrient/chemical pollution were cited.

- (b) The better responses gave a detailed account of the various components of the IPM program. These responses made valid judgements (using specific identified criteria such as cost effectiveness, environmental sustainability and chemical resistance/residues) about the individual components of the IPM program or about the program in its totality. The weaker responses did not identify a specific pest/disease and gave vague descriptions about a range of pest control techniques.

Question 8

- (a) Weaker responses demonstrated a poor understanding of what is meant by a ‘recent’ technology and only outlined an effect of the technology.

- (b) Better responses explained how techniques developed a new or existing market and provided clear value judgements.

Question 9

- (a) Better scoring responses identified operations and the time at which the operations were performed as well as explaining how the timing of the operations improved productivity.
- (b) Weaker responses did not identify a group or organisation. The best responses included a value judgment of the impact of the group or organisation as well as clear reasons for this judgment.

Paper 2

Question 1 – Agribusiness

- (a) Better responses identified more than one source of finance and outlined characteristics of the finance from this source for example, rates of interest and availability.
- (b) Weaker responses did not identify a study and/or how information/data was collected regarding the impact of a large rural organisation on agricultural industries. Better responses identified a study and outlined how the data was collected in this study.
- (c) Better responses provided examples of marketing options for a specific product as well as providing points for and/or against the outlined marketing option.

Question 2 – Animal Management

- (b) Better responses showed how the results were analysed and presented in a recent study.
- (c) Better responses demonstrated an extensive knowledge of implications associated with the introduction of specific new technologies or an understanding of social, financial and managerial implications on the introduction of new technologies.

Question 3 – Horticulture

- (a) Better responses showed a clear link to improved output, for example ‘pruning of peach trees is carried out to ensure a healthy wood/fruit balance on each tree’. Weaker responses outlined a management technique that could increase the level of output in a horticultural operation but did not link the technique to an increase in production.
- (b) Better responses identified a study and explained relevant considerations, such as approaches to experimental design.
- (c) Weaker responses did not demonstrate an understanding of plant propagation techniques.

Question 4 – Innovation and Diversification

- (a) Weaker responses did not identify an ‘alternative agricultural production system’ or technology.
- (b) Better responses explained reasons for randomising, replicating, standardising, simplifying and incorporating a control, such as to eliminate bias in the research design.
- (c) Better responses discussed social barriers such as culture, ethnicity, religion, tradition, ignorance, habit, moral/ethical objections, and then explained ways to overcome them such as education, promotion, marketing, research, pricing, advocacy. Weaker responses focused on issues and problems associated with establishing alternative agricultural production systems or enterprises.

Question 5 – Plant Management

- (a) Better responses showed how an organ’s function is related to its cellular anatomy.
- (b) Better responses identified a specific study related to plant breeding. They stated the role of control, replication, randomisation and standardisation in the trial they had identified. Weaker responses simply identified some of these steps or gave a generalised account of research methodology without linking it to a specific study.
- (c) Better responses demonstrated an extensive understanding of the use of hormones in plant production systems and made some relevant points for and/or against their use. Weaker responses gave an outline of the role of some plant hormones in plants, but did not describe how the hormones are used to manipulate plant production, and failed to give any points for and/or against their use.

Question 6 – Sustainable Management

- (a) Better responses clearly outlined the purpose of the Australian Land Capabilities system in sustainable land use practices and sketched the main features of the system. Weaker responses only stated its use for sustainability.
- (b) The better responses identified a specific study relating to conservation and efficient use of water, outlined the findings and clearly related it to its impact on agricultural systems. Poorer responses did not identify a study and provided general information about water conservation.
- (c) The better responses demonstrated an extensive understanding of whole-farm planning and its components. They provided a number of points for and/or against its use in achieving sustainability in agriculture.

The weaker responses did not outline whole farm planning and listed production cycles and calendars of operations.

There was some confusion between whole farm planning and Total Catchment Management.

Optional Research Project

Better projects were characterised by:

- the selection of a relevant agricultural problem or issue
- the statement of a clear research question
- the use of appropriate research methodologies including experimental design, data collection and data analysis
- appropriate conclusions drawn from the data collected and meaningful recommendations emanating from the research question and findings
- flexibility in drawing conclusions and responding to unexpected findings, trends and outcomes of the research
- good structure, ie the project was within the 3000–5000 word limit and presented cohesively
- the inclusion of a properly referenced, concise and relevant literature review that focused directly on previous research associated with the research question, and reviewed literature was referred to throughout the project and not presented in isolation
- consideration of ethical and welfare issues related to the research conducted
- the inclusion of a precise synopsis of the research and an accurate bibliography
- appropriate acknowledgement of all sources, collaboration and assistance.

Better projects were accompanied by process journals that clearly detailed the progress in developing and conducting the research as well as the assistance sought during the process. This is an important aspect of the report writing process as it assists validating the candidate's choice of topic of research.

Weaker projects did not articulate a clearly defined research question that was relevant to modern agriculture. In these projects the research methodology, data collection techniques and data analysis often contained serious flaws. Some responses measured variables that were inappropriate for answering the research question posed. This reflected poor organisation and lack of time in the planning and conduct of the research. In a significant number of projects the section on ethical and welfare considerations was missing.

Weaker projects contained a poor literature review. In these projects all the information about the topic was presented in a general sense and not directly related to the research question. Many weaker projects did not refer to previous research. The quantity of material presented in the literature review is not as important as its relevance. The literature review should discuss previous research in relation to the issue or problem that is the subject of the research and attempt to outline the current state of knowledge about the issue under investigation. Better projects not only presented relevant literature reviews, but also related their own findings back to those of other researchers. These projects were well organised and demonstrated a clear understanding of the role of the literature review in a research project.

Many of the weaker quantitative projects displayed poor experimental design; for example, too many variables, inadequate replication, lack of randomisation and poor attention to standardisation of conditions were often evident. Weaker projects that were qualitative in nature often used an inadequate sample size, leading to less meaningful results and then making it difficult to draw conclusions and write discussions. Poor experimental design then hindered the analysis of the results and the development of meaningful conclusions. Projects with such flaws rarely acknowledged this error or provided suitable recommendations to rectify faults in future research. Students doing projects that are survey-based research should be advised that there are well-

documented strategies and conventions for designing questions. Surveys often lacked a large enough sample size or were extremely biased in their sampling technique.

The analysis of the statistics collected should clearly show that the candidate understands the analysis and is not merely regurgitating information. The analysis must be appropriate for the data collected.

Weaker projects presented poor referencing with no clear link from the text to the details in the reference section. Often website references were not dated. It should be noted that where a website provides a window to a publication, the publication should be cited, not the website. The best quality literature reviews were ones that referenced current material from a wide range of sources of different types.

The presentation of data should be ethical and unbiased. In the presentation of data, weaker projects presented discontinuous scales on graphs. This makes results look more significant, but it is not an accurate presentation of data. Where histograms are used, include standard deviations or standard errors on the graph. Some weaker projects attempt to pad out results by presenting the same data in several graphical forms or present graphs of raw data on each experimental group rather than a final graph to compare means of each treatment. An example would be line graphs which show the growth of every animal in each treatment group rather than one in which the means of the animals' growth in each group are compared.

Projects should be developed from an original research question, and not be very similar to other projects or merely substantiate a well documented and understood scientific principle, such as the role of protein in growth and development. Weaker projects investigated questions that were extremely simplistic or had obvious outcomes, for example the effect of changing protein levels on animal growth, NPK fertiliser effects on plants, comparisons of common products and techniques with well-documented effects, and investigations into the effects of basic inputs.

The weaker projects simply submitted a report, describing a topic without conducting any experimental investigation.

In many of the better projects, journals indicated that there had been regular consultation between the student and their agriculture teacher and other experts to monitor experimental design, statistical analysis and their research for the literature review. These better projects used the journal appropriately, documenting field notes, raw results, interview notes and reflections of the candidate. When used correctly the journal provides an excellent window into the candidate's development as they research, carry out the trial and grapple with the final write-up. These journals should not be typed up and presented as a polished document. They should be raw diaries, in exercise or note books, showing the passage of time and the development of the candidate's work.

If candidates are to be involved in research carried out by others it must be clear that they had substantial input into design, data collection and analysis. Ideally they should be involved from the inception of the research. At a minimum, they should play a substantial role in the collection of experimental data.

Agriculture Paper 1

2007 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I			
1 (a)	1	Farm/ Product Study	H2.1, H2.2, H3.1
1 (b)	2	Farm/ Product Study	H3.1
1 (c)	4	Farm/ Product Study	H3.2
2 (a)	1	Sustainable Agricultural Production	H2.1
2 (b)	2	Sustainable Agricultural Production	H2.1
2 (c)	4	Sustainable Agricultural Production	H1.1
3 (a)	1	Experimental Analysis	H2.1
3 (b)	2	Experimental Analysis	H2.1
3 (c)	4	Experimental Analysis (Factors)	H1.1
3 (d)	4	Experimental Analysis (Factors)	H1.1
Section II			
4 (a)	2	Animal Production Systems (G & D)	H2.2
4 (b)	3	Animal Production Systems (Development)	H2.2
4 (c)	4	Animal Production Systems (Growth/Nutrition)	H2.2
4 (d)	6	Animal Production Systems (Nutrition)	H2.2
5 (a) (i)	2	Plant Production Systems (Interference)	H2.1
5 (a) (ii)	3	Plant Production Systems (Interference)	H2.1
5 (b)	4	Plant Production Systems (Genotype)	H2.1
5 (c)	6	Plant Production Systems (Genotype/Environment)	H2.1
Section III			
6 (a)	5	Sustainable Agricultural Production (Soil Fertility)	H1.1
6 (b)	10	Sustainable Agricultural Production (Soil Fertility)	H1.1
7 (a)	5	Roles of Government in protecting Waterways	H1.1
7 (b)	10	Microbes and Invertebrates (IPM)	H2.1, H2.2
8 (a)	5	Farm Product Study (Technology)	H3.3
8 (b)	10	Farm Product Study (Marketing)	H3.3
9 (a)	5	Farm Product Study (Timing of Operations)	H3.4
9 (b)	10	Sustainable Agricultural Products (Broader and community and government)	H1.1

Agriculture Paper 2

2007 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Question 1 — Agribusiness			
1 (a)	3	Processes in Agricultural Systems	H3.4
1 (b)	4	Research Methodology	H4.1
1 (c)	8	Innovation, Ethics, Current Issues	H5.1
Question 2 — Animal Management			
2 (a)	3	Processes In Agricultural Systems	H3.4
2 (b)	4	Research Methodology	H4.1
2 (c)	8	Innovation, Ethics, Current Issues	H5.1
Question 3 — Horticulture			
3 (a)	3	Processes In Agricultural Systems	H3.4
3 (b)	4	Research Methodology	H4.1
3 (c)	8	Innovation, Ethics, Current Issues	H5.1
Question 4 — Innovation and Diversification			
4 (a)	3	Processes In Agricultural Systems	H3.4
4 (b)	4	Research Methodology	H4.1
4 (c)	8	Innovation, Ethics, Current Issues	H5.1
Question 5 — Plant Management			
5 (a)	3	Processes In Agricultural Systems	H3.4
5 (b)	4	Research Methodology	H4.1
5 (c)	8	Innovation, Ethics, Current Issues	H5.1
Question 6 — Sustainable Land and Resource Management			
6 (a)	3	Processes In Agricultural Systems	H3.4
6 (b)	4	Research Methodology	H4.1
6 (c)	8	Innovation, Ethics, Current Issues	H5.1

2007 HSC Agriculture Paper 1 Marking Guidelines

Section I

Question 1 (a)

Outcomes assessed: H2.1, H2.2, H3.1

MARKING GUIDELINES

Criteria	Marks
• Names one input to the farm system for the named product	1

Question 1 (b)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Shows a relationship between input cost on profitability of the product	2
• Identifies an effect of input cost on profitability of the named product	1

Question 1 (c)*Outcomes assessed: H3.2***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Outlines a practice farmers may use to manage an identified risk that links to a particular market specification	4
<ul style="list-style-type: none">• Outline a management practice and relates this to risk OR <ul style="list-style-type: none">• Outlines a management practice and links this to a market specification OR <ul style="list-style-type: none">• Outlines a relationship between risk and market specifications	3
<ul style="list-style-type: none">• Outlines a management practice OR <ul style="list-style-type: none">• Outlines a market specification for the named product OR <ul style="list-style-type: none">• Outlines a risk associated with the product	2
<ul style="list-style-type: none">• Identifies a market specification for the product OR <ul style="list-style-type: none">• Identifies a management practice OR <ul style="list-style-type: none">• Identifies a risk associated with the product	1

Question 2 (a)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Identifies that the Wheat / Canola / Wheat rotation (Rotation C) resulted in the highest yield	1

Question 2 (b)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Sketches in general terms a way crop rotations can increase crop yields	2
<ul style="list-style-type: none">• Identifies a way crop rotation can increase crop yields	1

Question 2 (c)*Outcomes assessed: H1.1***MARKING GUIDELINES**

Criteria	Marks
• Provides a number of reasons to support the use of minimum tillage practices in Australian farming systems, demonstrating its benefits	4
• Explains the use/s of minimum tillage in Australian Farming systems and benefits that may result	3
• Outlines minimum tillage and its use in Australian farming systems	2
• Identifies a component or effect of the use of minimum tillage	1

Question 3 (a)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
• States one measurement of plant growth or development	1

Question 3 (b)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
• Sketch in general terms a method that may be used to analyse the results obtained from the experiment	2
• Identifies a method used to analyse the results	1

Question 3 (c)*Outcomes assessed: H1.1***MARKING GUIDELINES**

Criteria	Marks
• Provides characteristics and features of ways this student has increased the reliability of results	4
• Provides characteristics and features of a way this student has increased the reliability of results	3
• Identifies a way reliability of results can be increased in experiments	
• Provides characteristics and features of a way this student has increased the reliability of results	2
OR	
• Identifies ways to increase reliability of results in experiments	
• Identifies a way reliability of results can be increased in experiments	1

Question 3 (d)*Outcomes assessed: H1.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">Identifies factors that need to be considered, providing points for and/or against each	4
<ul style="list-style-type: none">Identifies a factor that needs to be considered providing points for/or againstOutlines factors that may need to be considered in field trials rather than glasshouse trials	3
<ul style="list-style-type: none">Identifies a factor that needs to be considered, providing points for and/or against <p>OR</p> <ul style="list-style-type: none">Outlines factors that may need to be considered in field trials rather than glasshouse trials.	2
<ul style="list-style-type: none">Identifies a factor that needs to be considered if undertaking a field trial rather than a glasshouse trial	1

Section II

Question 4 (a)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Relates a stage of development to a higher/increased/accelerated growth rate between R and S 	2
<ul style="list-style-type: none"> States the relationship between weight gain (high) and time (short) to indicate high growth rate OR <ul style="list-style-type: none"> Identifies a stage of development that relates to high growth 	1

Question 4 (b)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Outlines a variation in body composition that may occur in animals linking this to the sex of the animal 	3
<ul style="list-style-type: none"> Outlines a variation that may occur in the body composition of animals OR <ul style="list-style-type: none"> Identifies an aspect of body composition that varies with the sex of the animal. 	2
<ul style="list-style-type: none"> Identifies an aspect of the body composition of animals 	1

Question 4 (c)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Sketches in general terms reasons that may have led to variation in average growth rate between the pens 	4
<ul style="list-style-type: none"> Sketches in general terms a reason for variation in average growth rate between the pens Identifies a reason for variation in growth between the pens 	3
<ul style="list-style-type: none"> Sketches in general terms a reason for variation in average growth rate between the pens OR <ul style="list-style-type: none"> Identifies reasons for variation in growth rate between the pens 	2
<ul style="list-style-type: none"> Identifies a reason for variation in growth rate between the pens 	1

Question 4 (d)*Outcomes assessed: H2.2***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">Relates the implications of a number of management strategies used to meet the nutritional requirements of a named animal	5–6
<ul style="list-style-type: none">Outlines management strategies used to meet nutritional requirements and attempts to relate the implication of at least ONE of these to meeting nutritional need of a named animal	3–4
<ul style="list-style-type: none">Identifies management strategies used in nutritional management OR <ul style="list-style-type: none">Identifies nutritional requirement of a named animal	1–2

Question 5 (a) (i)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">Identifies the correct weed species and the plant density	2
<ul style="list-style-type: none">Identifies correct weed species OR <ul style="list-style-type: none">Identifies correct weed density OR <ul style="list-style-type: none">Identifies the correct weed species and the plant density but includes an incorrect treatment	1

Question 5 (a) (ii)*Outcomes assessed: H2.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">Outlines a form of competition by weeds or another effect of weeds and relates this effect to decreased yield of sunflowers	3
<ul style="list-style-type: none">Outlines a form of competition from weeds for resources or another effect of weeds	2
<ul style="list-style-type: none">Identifies some form of competition by weeds or another effect of weeds	1

Question 5 (b)
Outcomes assessed: H2.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms indicating the main features of methods plant breeders use to develop new varieties 	4
<ul style="list-style-type: none"> • Sketches in general terms a method plant breeders can use to develop new varieties • Identifies a method plant breeders can use to develop new varieties 	3
<ul style="list-style-type: none"> • Identifies the methods plant breeders can use to develop new varieties OR <ul style="list-style-type: none"> • Sketches in general terms a method plant breeders can use to develop new varieties 	2
<ul style="list-style-type: none"> • Identifies a method plant breeders use to develop new varieties 	1

Question 5 (c)
Outcomes assessed: H2.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Identifies the issues by providing points for and/or against factors farmers could consider before choosing new variety clearly linking to the replacement of existing varieties 	5–6
<ul style="list-style-type: none"> • Outlines factors farmers should consider when choosing to replace an existing variety with a new variety OR <ul style="list-style-type: none"> • Outlines a factor farmers should consider before choosing to replace an existing variety with a new variety AND • Identifies factor(s) farmers should consider before choosing to replace an existing variety with a new variety 	3–4
<ul style="list-style-type: none"> • Outlines a factor farmers should consider before choosing to replace an existing variety with a new variety OR <ul style="list-style-type: none"> • Identifies factor(s) farmers should consider before choosing to replace an existing variety with a new variety 	1–2

Section III

Question 6 (a)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Outlines effects of a named soil nutrient and relates each of these to farm production 	5
<ul style="list-style-type: none"> Outlines effects of a named soil nutrient and relates one of these to farm production OR <ul style="list-style-type: none"> Outlines THREE or more effects of a named soil nutrient 	3–4
<ul style="list-style-type: none"> Outlines an effect of a named soil nutrient OR <ul style="list-style-type: none"> Identifies a soil nutrient OR <ul style="list-style-type: none"> Identifies effect(s) of soil nutrients 	1–2

Question 6 (b)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Explains techniques in improving soil fertility and places a value judgement on each of these techniques against identified criteria / other alternatives 	9–10
<ul style="list-style-type: none"> Explains techniques in improving soil fertility and EITHER places a value judgement on each OR identifies other alternatives to each 	7–8
<ul style="list-style-type: none"> Explains techniques in improving soil fertility OR <ul style="list-style-type: none"> Explains a technique in improving soil fertility and places a value judgement on this against an identified criteria 	5–6
<ul style="list-style-type: none"> Outlines techniques used to improve soil fertility OR <ul style="list-style-type: none"> Explains a technique used to improve soil fertility 	3–4
<ul style="list-style-type: none"> Outlines a technique used to improve soil fertility OR <ul style="list-style-type: none"> Identifies technique(s) used to improve soil fertility 	1–2

Question 7 (a)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Outlines a role that government play, clearly relating this role to the protection of waterways 	5
<ul style="list-style-type: none"> • Outlines a role that government play and attempts to relate to the protection of a waterway OR <ul style="list-style-type: none"> • Outlines roles of that government play in protecting waterways 	3–4
<ul style="list-style-type: none"> • Outlines a role that government play in protecting waterways OR <ul style="list-style-type: none"> • Identifies a role that government play in protecting waterways 	1–2

Question 7 (b)

Outcomes assessed: H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Explains a number of the essential components of an IPM program and places a value judgement on the component or program as a whole against an identified criteria for alternative method/s of management 	9–10
<ul style="list-style-type: none"> • Explains the essential components of an IPM program and EITHER places a value judgement on the program as a whole or some components of it OR identifies an alternative 	7–8
<ul style="list-style-type: none"> • Explains components of an IPM program OR <ul style="list-style-type: none"> • Gives a general outline of THREE components of an IPM program 	5–6
<ul style="list-style-type: none"> • Outlines components of an IPM program OR <ul style="list-style-type: none"> • Explains a significant component of an IPM program linking to Host/Pathogen or Environment 	3–4
<ul style="list-style-type: none"> • Outlines a component of an IPM program OR <ul style="list-style-type: none"> • Identifies component(s) of an IPM program 	1–2

Question 8 (a)*Outcomes assessed: H3.3***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Outlines effects of a recent technology and relates these effects to the plant or animal product	5
<ul style="list-style-type: none">• Outlines effects of a recent technology and relates ONE of these to the plant or animal product OR <ul style="list-style-type: none">• Outlines effects of a recent technology on the plant or animal product	3–4
<ul style="list-style-type: none">• Outlines an effect of a recent technology on plant or animal product studied OR <ul style="list-style-type: none">• Identifies a recent technology involved in plant or animal production	1–2

Question 8 (b)*Outcomes assessed: H3.3***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Explains techniques used to develop new or existing product markets and places a value judgement on each of these techniques against identified criteria/other techniques	9–10
<ul style="list-style-type: none">• Explains techniques used to develop new or existing product markets and EITHER places a value on each OR identifies other alternatives to each	7–8
<ul style="list-style-type: none">• Explains techniques used to develop new or existing product markets OR <ul style="list-style-type: none">• Explains a technique used to develop new or existing markets for a product and places value judgement on this against an identified criterion	5–6
<ul style="list-style-type: none">• Outlines techniques used to develop a new or existing product markets OR <ul style="list-style-type: none">• Explains a technique used to develop new or existing markets for a product	3–4
<ul style="list-style-type: none">• Outlines a technique used to develop new or existing markets for a product OR <ul style="list-style-type: none">• Identifies technique(s) used to develop new or existing markets for a product	1–2

Question 9 (a)
Outcomes assessed: H3.4
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Outlines farming operations and clearly relates the timing of these operations to the production of a plant or animal product 	5
<ul style="list-style-type: none"> • Outlines farming operations relating the timing of ONE of these to the production of a plant or animal product OR <ul style="list-style-type: none"> • Outlines farming operations and how these effect production of a plant or animal product 	3–4
<ul style="list-style-type: none"> • Outlines a farming operation for a plant or animal product and when it occurs OR <ul style="list-style-type: none"> • Identifies farming operation(s) 	1–2

Question 9 (b)
Outcomes assessed: H1.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Explains how community groups or organisations may affect the sustainability of agricultural production and places a value judgement on the impact of these groups against identified criteria or other alternatives 	9–10
<ul style="list-style-type: none"> • Explains how community groups or organisations may affect the sustainability of agricultural production and EITHER places a value judgement on each OR identifies other alternatives to each 	7–8
<ul style="list-style-type: none"> • Explains how community groups or organisations may affect the sustainability of agricultural production OR <ul style="list-style-type: none"> • Explains how a community group or organisation may affect the sustainability of agricultural production and places a value judgement on this against and identified criteria or alternative 	5–6
<ul style="list-style-type: none"> • Outlines the role of community groups or organisations on the sustainability or agricultural production OR <ul style="list-style-type: none"> • Explains the role of a community group or organisation on the sustainability of agricultural production 	3–4
<ul style="list-style-type: none"> • Outlines the role of a community group or organisation on the sustainability of agricultural production OR <ul style="list-style-type: none"> • Identifies community group(s) or organisations that may impact on sustainable agricultural production 	1–2

2007 HSC Agriculture Paper 2 Marking Guidelines

Question 1 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms the main features of a range of financial suppliers available to farm businesses 	3
<ul style="list-style-type: none"> • Sketches in general terms the main features of a financial supplier available to farm businesses <p>OR</p> <ul style="list-style-type: none"> • Names a range of financial suppliers 	2
<ul style="list-style-type: none"> • Names a financial supplier 	1

Question 1 (b)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Outlines a piece of information or data and provides how this was collected in an identified study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved 	4
<ul style="list-style-type: none"> • Outlines a piece of information or data and provides how this was collected in a study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved OR <ul style="list-style-type: none"> • Outlines pieces of data or information from an identified study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved 	3
<ul style="list-style-type: none"> • Identifies types of information or data from a study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved OR <ul style="list-style-type: none"> • Outlines a piece of information or data from a study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved 	2
<ul style="list-style-type: none"> • Identifies a study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved OR <ul style="list-style-type: none"> • Identifies a piece of information or data from a study that was undertaken to determine the impact of a large rural business organisation on the agricultural industries in which it was involved 	1

Question 1 (c)*Outcomes assessed: H5.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Provides a number of points for and/or against a range of marketing options available for a particular product• Demonstrates an extensive understanding of these options	7–8
<ul style="list-style-type: none">• Provides some points for and/or against marketing options available for a particular product	5–6
<ul style="list-style-type: none">• Provides a number of points for and/or against a marketing option available for a particular product OR <ul style="list-style-type: none">• Outlines marketing options available for a particular product OR <ul style="list-style-type: none">• Explains in detail a marketing option suited to a particular product	3–4
<ul style="list-style-type: none">• Outlines a marketing option available for a particular product OR <ul style="list-style-type: none">• Identifies marketing option(s) available for a particular product	1–2

Question 2 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Sketches in general terms a technique and clearly states its use in managing reproduction in farm animals 	3
<ul style="list-style-type: none"> • Sketches in general terms the main features of a technique used by the farmer to manage reproduction in farm animals 	2
<ul style="list-style-type: none"> • Identifies a technique used by farmers to manage reproduction in farm animals 	1

Question 2 (b)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Outlines a way results were analysed and how these were presented in an identified study of a current technique/technology which is advancing productivity in animal production systems 	4
<ul style="list-style-type: none"> • Outlines a way results were analysed and how these were presented in a study of a current technique/technology which is advancing productivity in animal production systems OR <ul style="list-style-type: none"> • Outlines ways results were analysed or presented in a study of a current technique/technology which is advancing productivity in animal production systems 	3
<ul style="list-style-type: none"> • Identifies ways results were analysed or presented in a study of a current technique/technology which is advancing productivity in animal production systems OR <ul style="list-style-type: none"> • Outlines a way results were analysed or presented in a study of a current technique/technology which is advancing productivity in animal production systems 	2
<ul style="list-style-type: none"> • Identifies a study of a current technique/technology which is advancing productivity in animal production systems OR <ul style="list-style-type: none"> • Identifies a way results can be analysed or presented 	1

Question 2 (c)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Provides a number of points for and/or against a range of implications associated with the successful introduction of new technologies into animal production systems Demonstrates an extensive understanding of introducing new technologies 	7–8
<ul style="list-style-type: none"> Provides some points for and/or against the implications associated with the successful introduction of new technologies into animal production systems 	5–6
<ul style="list-style-type: none"> Provides a number of points for and/or against an implication associated with the successful introduction of new technologies into animal production systems OR Outlines implications associated with the successful introduction of new technologies into animal production systems OR <ul style="list-style-type: none"> Explains in detail an implication associated with the successful introduction of new technologies into animal production systems 	3–4
<ul style="list-style-type: none"> Outlines an implication associated with the successful introduction of new technologies into animal production systems OR <ul style="list-style-type: none"> Identifies implication(s) associated with the successful introduction of new technologies into animal production systems 	1–2

Question 3 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Sketches in general terms a management technique and clearly states its use in increasing the level of output in a horticultural production system 	3
<ul style="list-style-type: none"> Sketches in general terms the main features of a management technique used to increase the level of output in a horticultural production system 	2
<ul style="list-style-type: none"> Identifies a management technique used to increase the level of output in a horticultural production system 	1

Question 3 (b)
Outcomes assessed: H4.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Outlines research factors, relating these to the identified study of a current technique/technology which is advancing productivity in horticultural production systems 	4
<ul style="list-style-type: none"> Outlines research factors, relating ONE of these to a study of a technological innovation aimed at improving productivity in a particular horticultural industry 	3
<ul style="list-style-type: none"> Identifies research factors considered in a study of a technological innovation aimed at improving productivity in a particular horticultural industry OR <ul style="list-style-type: none"> Outlines a research factor considered in a study of a technological innovation aimed at improving productivity in a particular horticultural industry 	2
<ul style="list-style-type: none"> Identifies a study of a technological innovation aimed at improving productivity in a particular horticultural industry OR <ul style="list-style-type: none"> Identifies a research factor considered in a study of a technological innovation aimed at improving productivity in a particular horticultural industry 	1

Question 3 (c)
Outcomes assessed: H5.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Provides a number of points for and/or against a range of plant propagation techniques relating these to plant physiology Demonstrates an extensive understanding of plant propagation techniques in terms of plant physiology 	7–8
<ul style="list-style-type: none"> Provides some points for and/or against plant propagation techniques relating at least ONE of these to plant physiology 	5–6
<ul style="list-style-type: none"> Provides a number of points for and/or against a plant propagation technique relating this to plant physiology OR <ul style="list-style-type: none"> Outlines plant propagation techniques 	3–4
<ul style="list-style-type: none"> Outlines a plant propagation technique OR <ul style="list-style-type: none"> Identifies plant propagation technique(s) 	1–2

Question 4 (a)*Outcomes assessed: H3.4***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Sketches in general terms the effect of a named environmental factor on an identified alternative agricultural production system or technology	3
<ul style="list-style-type: none">• Identifies an effect of a named environmental factor on an identified alternative agricultural production system or technology	2
<ul style="list-style-type: none">• Identifies an environmental factor that may effect an identified alternative agricultural production system or technology	1

Question 4 (b)*Outcomes assessed: H4.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Outlines the significant steps of the method and why these were used in an identified study on the development and implementation of an alternative agricultural production system or technology	4
<ul style="list-style-type: none">• Outlines some of the significant steps of the method and why these were used in a study on the development and implementation of an alternative agricultural production system or technology	3
<ul style="list-style-type: none">• Identifies significant steps of the method used in a study on the development and implementation of an alternative agricultural production system or technology <p>OR</p> <ul style="list-style-type: none">• Outlines a significant step of the method used in a study on the development and implementation of an alternative agricultural production system or technology	2
<ul style="list-style-type: none">• Identifies a study on the development and implementation of an alternative agricultural production system or technology <p>OR</p> <ul style="list-style-type: none">• Identifies a significant step of the method used in a study on the development and implementation of an alternative agricultural production system or technology	1

Question 4 (c)*Outcomes assessed: H5.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">Provides a number of points indicating how social barriers, resulting from the development of an alternative agricultural system or enterprise, can be overcomeDemonstrates an extensive understanding of overcoming social barriers	7–8
<ul style="list-style-type: none">Provides some points indicating how social barriers, resulting from the development of an alternative agricultural system or enterprise, can be overcome	5–6
<ul style="list-style-type: none">Provides a number of points indicating how a social barrier, resulting from the development of an alternative agricultural system or enterprise, can be overcome OR <ul style="list-style-type: none">Outlines social barriers to the development of an alternative agricultural system or enterprise OR <ul style="list-style-type: none">Outlines methods for overcoming social barriers (without outlining a specific social barriers)	3–4
<ul style="list-style-type: none">Outlines a social barrier to the development of an alternative agricultural system or enterprise OR <ul style="list-style-type: none">Identifies social barrier(s)	1–2

Question 5 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Sketches in general terms the function of a major plant organ and clearly states its relationship with cellular anatomy 	3
<ul style="list-style-type: none"> Sketches in general terms a relationship between cellular anatomy and function of a plant organ 	2
<ul style="list-style-type: none"> Sketches in general terms the cellular anatomy of a major plant organ OR <ul style="list-style-type: none"> Identifies a relationship between cellular anatomy and a major plant organ 	1

Question 5 (b)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Outlines the significant steps of the method and why these were used in an identified study on the role of plant breeding or related research in advancing productivity of plant production systems 	4
<ul style="list-style-type: none"> Outlines some of the significant steps of the method and why these were used in a study on the role of plant breeding or related research in advancing productivity of plant production systems 	3
<ul style="list-style-type: none"> Identifies significant steps of the method used in a study on the role of plant breeding or related research in advancing productivity of plant production systems OR <ul style="list-style-type: none"> Outlines a significant step of the method used in a study on the role of plant breeding or related research in advancing productivity of plant production systems 	2
<ul style="list-style-type: none"> Identifies a study on the role of plant breeding or related research in advancing productivity of plant production systems OR <ul style="list-style-type: none"> Identifies a significant step of the method used in a study on the role of plant breeding or related research in advancing productivity of plant production systems 	1

Question 5 (c)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Provides a number of points for and/or against using plant hormones in plant production systems Demonstrates an extensive understanding of plant hormones used in manipulating plant production 	7–8
<ul style="list-style-type: none"> Provides some points for and/or against using plant hormones in plant production systems 	5–6
<ul style="list-style-type: none"> Provides a number of points for and/or against using a plant hormone in plant production systems OR	3–4
<ul style="list-style-type: none"> Outlines uses of plant hormones in plant production systems Outlines a plant hormone and its use in plant production systems OR	1–2
<ul style="list-style-type: none"> Identifies plant hormone(s) 	

Question 6 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> Sketches in general terms the main features of the Australian Land Capabilities system and clearly states its purpose in sustainable land use practices 	3
<ul style="list-style-type: none"> Sketches in general terms the main features of the Australian Land Capabilities system 	2
<ul style="list-style-type: none"> Identifies that the Australian Land Capabilities system is associated with sustainable land use practices 	1

Question 6 (b)*Outcomes assessed: H4.1***MARKING GUIDELINES**

Criteria	Marks
<ul style="list-style-type: none">• Outlines a finding from an identified study on innovative technologies, or practices that are assisting with the conservation and efficient use of water and relates the impact of this finding to agricultural production systems	4
<ul style="list-style-type: none">• Outlines a finding from a study on innovative technologies, or practices that are assisting with the conservation and efficient use of water and relates the impact of this finding to agricultural production systems	3
<ul style="list-style-type: none">• Outlines a finding from a study of innovative technologies, or practices that are assisting with the conservation and efficient use of water in agricultural production systems	2
<ul style="list-style-type: none">• Identifies a study on innovative technologies, or practices that are assisting with the conservation and efficient use of water in agricultural production systems <p>OR</p> <ul style="list-style-type: none">• Identifies a finding from a study of innovative technologies, or practices that are assisting with the conservation and efficient use of water in agricultural production systems	1

Question 6 (c)
Outcomes assessed: H5.1
MARKING GUIDELINES

Criteria	Marks
<ul style="list-style-type: none"> • Provides a number of points for and/or against the use of whole-farm planning in achieving sustainability in agriculture • Demonstrates an extensive understanding of whole-farm planning and its components 	7–8
<ul style="list-style-type: none"> • Provides some points for and/or against the use of whole-farm planning in achieving sustainability in agriculture, including an outline of some aspects of whole-farm planning 	5–6
<ul style="list-style-type: none"> • Provides points for and/or against the use of whole-farm planning in achieving sustainability in agriculture OR <ul style="list-style-type: none"> • Outlines aspects of whole-farm planning in achieving sustainability in agriculture 	3–4
<ul style="list-style-type: none"> • Outlines an aspect of whole-farm planning in achieving sustainability in agriculture OR <ul style="list-style-type: none"> • Identifies aspect(s) of whole-farm planning in achieving sustainability in agriculture 	1–2