2004 HSC Notes from
The Marking Centre
Agriculture

Contents

2004 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 provides comments with regard to responses to the 2004 Higher School Certificate Examination, indicating the quality of candidate responses and highlighting the relative strengths and weaknesses of the candidature in each section and each question.

It is essential for this document to be read in conjunction with the relevant syllabus, the 2004 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 2004, 1272 candidates attempted the Agriculture examination.

Teachers and candidates should be aware that as agriculture is an applied science, 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'.

Paper 1

Section I

This is a mandatory section which focused on the farm product study, factors affecting production and the subsequent social impacts, experimental procedure and interpretation of data. Generally candidates performed well in the initial parts of each question.

Candidates scoring highest marks satisfactorily interpreted questions and responded appropriately to key words. More limited responses reflected an inability to adequately 'explain' (link cause and effect) or 'justify' (support an argument) as required, providing simplistic descriptions instead.

Question 1

(a) The majority of responses named a measurable feature of the quantity or quality of production. Many did not attach a unit of measurement.

(b) Most responses outlined an on-farm practice that improved product quality or identified a practice and related how it improved product quality.

(c) Better quality responses identified a factor that affected the quality of the product after it left the farm and were able to draw out the relationship between that factor and an

improvement or decrease in product quality. A significant number of responses chose an 'off-farm' factor that had its impact on the farm. Examples include such things as drought or weather conditions. These responses received lower marks.

(d)   Candidates scoring maximum marks were able to identify a process (or processes) that added value to their chosen product. These responses included a detailed explanation of how value is added to the product by the process (or processes). They cited such things as stimulating consumer demand by producing a wider range of consumer goods or by increasing the convenience of the product and then related these to higher prices that can be charged for the products, thus showing a clear understanding of the concept of value-adding.

Responses which scored fewer marks explained value adding in more general terms. Low marks were given to responses which simply described the processing of the nominated product.

Question 2

(a)   The majority of candidates could identify the trend of an increase in the area planted over time. There was some confusion between trends in production and trends in area planted.

(b)   Most responses named a factor that influenced total production. A limited number could provide a specific reason for the change.

(c)   Many candidates could describe a simplistic link between levels of production, farm income and wealth in the local community.

The better scoring responses explained a dependent relationship between fluctuating farm production, income and community prosperity.

A limited number then went on to explain the relationship between regional prosperity and regional sustainability.

Question 3

(a)   Better responses identified a 'nil' treatment of 0kgN/ha or the 'accepted regional application rate' as a control in this experimental design question. Weaker responses commonly confused the control with an 'average' between the two treatments (ie 30kgN/ha) or randomly selected another amount, providing no reasoning behind their choice.

(b)   Many candidates could identify the control as a base for a quantitative comparison with other treatments, but did not link this to the stated trial. Candidates scoring full marks were able to link the control comparison to the two different fertiliser treatments and the effect that these two treatments could have on the yield of wheat.

(c)   Many candidates gained full marks for successfully demonstrating the concepts of replication and randomisation by dividing the 'plot' into multiple, equal sized plots with correct labelling. However, weaker responses often did not either replicate the trial at least three times or illustrate randomisation in the trial design.

(d)   The majority of candidates could suggest two further investigations but then did not outline a supportive argument for each investigation before making a recommendation. For example, a low scoring response suggested replication of the trial over a wider range of locations in the district before making a recommendation. A higher scoring response also justified this investigation by stating the need to find if the suggested rates would be applicable to the whole district, not just the farm that the initial trial was conducted on.

Section II

This compulsory section focuses on the plant and animal content of the syllabus. Question 4 (a), (b), (c) and (d) were animal based and Question 5 and 4(e) related to plants and/or soils.

Question 4

(a)   The majority of responses identified changes in the proportions of hay and grain across all three rations. Those that referred to only one change in hay and/or grain scored lower marks.

(b)   Most candidates identified cattle as ruminants. Better responses clearly described a process of rumination involving the utilisation of hay as a feed source. Lower scoring responses only mentioned the ability of cattle to digest hay, omitting a clear description of a feature enabling this to occur.

(c)   Better responses clearly related required changes in the proportion of grain and hay to changes in microbial populations in the rumen and subsequent problems of acidosis/grain poisoning/ bloat. Responses that related dietary changes to the stage of the animals' production were awarded lower marks.

(d)   Most of the varied responses to this question included an example of a practice to manage the nutritional requirements of animals. Highest scoring responses were able to link the practice to the production cycle of a named animal eg the supplementary feeding of pregnant ewes to increase lamb survival rates in prime lamb production.

(e)   The majority of candidates answered this question well. Better responses provided advantages and disadvantages of native AND introduced pasture species and formed a judgement in relating these to production goals and sustainability. Candidates who described native and/or introduced pastures without adequately linking their features to production or sustainability goals scored lower marks. More imaginative responses went beyond the bounds of current technology, proposing hybridisation of native and introduced species to achieve farmer goals.

Question 5

(a)   The majority of candidates scored full marks by identifying four soil nutrients required by plants. Responses that scored lower marks included factors affecting plants other than soil nutrients.

(b)   The best responses provided an appropriate example to explain the effect of a factor on the availability of a particular soil nutrient for the growth of plants. Many responses did not identify a specific nutrient and could not clearly explain the link between the factor,

eg pH and the nutrient's availability. Lowest scoring responses identified a factor but did link it to a factor influencing it or plant growth.

(c) Responses scoring full marks provided details of advantages and disadvantages of two organic methods of improving soil fertility. A number did not score in the high mark range as they described methods rather than discussing them. Lower scoring responses identified one or two organic methods, however they demonstrated little understanding of their significance in improving fertility. A number of responses indicated a lack of understanding of the term 'organic' in relation to management of soil fertility.

(d) Highest scoring responses identified a method of genetic manipulation in a specific plant production system and clearly linked it to changes in output, quality or disease resistance etc. Lower scoring responses were unable to link plant breeding to improved plant performance.

Section III

Candidates were required to select one extended structured response question from a choice of four in Section III. This section examined all aspects of the course, with a focus on explaining and assessing the effectiveness of management processes in agricultural systems.

Generally candidate performance was good in part (a) of each question where a description of factors or effects was required. Part (b) in most cases was not as well answered. Candidates were able to identify and describe the required features, characteristics or relationships in most cases. In some questions, many responses failed to provide adequate discussion of the issues involved or the effectiveness of decisions or management strategies. In a number of cases, responses indicated that candidates found it difficult to relate cause and effect, as part of their explanation.

Question 6

Approximately 45% of candidates attempted this question. In general, both parts were answered well, indicating a good understanding of plant production and its management.

(a) This part was well answered by most candidates. Almost all candidates correctly identified three environmental factors. The majority of candidates described at least two factors adequately. The best responses gave significant features and characteristics of all three stated environmental factors.

(b) Almost all responses listed a valid strategy farmers could use to modify the impact of each factor. Most candidates could explain the strategy adequately. Better responses fully discussed the impact of the strategies on plant production, including major advantages and disadvantages.

Question 7

Approximately 13% of candidates attempted this question. Many candidates did not address the tension between profitability and sustainability in part (b).

(a) Most candidates successfully identified factors that impacted on farm business profitability. The majority of responses used examples such as product quality,

production levels and consumer demand in the answer. The highest scoring responses then provided the relevant features of each factor that influenced profitability.

(b)   High scoring responses were well constructed; they explained the effects of well described management decisions AND linked these to both profitability and sustainability. Weaker responses did not distinguish between profitability and long-term sustainability, concluding that profitability and financial sustainability were equivalent. Often, candidates concentrated on an outline of the general effects of management decisions and did not provide any link with profitability or sustainability.

Question 8

Approximately 20% of candidates attempted this question. Part (b) was not answered in the depth required and a high percentage of responses made no reference to legal or ethical issues that have arisen due to the need to meet consumer preferences.

(a)   Most candidates were able to identify at least one change in consumer preference. Higher scoring responses identified at least two changed preferences in a specific animal production system and provided the key features of each.

(b)   Higher scoring responses explained how the strategies they described made their product suitable to meet these changed consumer preferences. Better responses also identified legal and/or ethical issues confronting producers and/or the industry as a whole and were able to provide some detailed information about them. Many lower scoring responses identified three management practices but were unable to develop the link to changes in consumer preferences.

Question 9

Approximately 15% of candidates attempted this question.

(a)   The majority of candidates could adequately identify and give features of three technological innovations. Highest marks were achieved by those responses that provided a full description of each technology. Poorer responses provided little detail or used technologies that were far from 'innovative', eg the stump-jump plough and the wheel.

(b)   Many responses clearly provided a link between the three innovations and a production or marketing goal, few were able to explain this link. Higher scoring responses provided a clear explanation of how the innovation affected the stated goal eg the use of AI and EBVs in the production of marbled beef for the Japanese export market. The majority of candidates were able to list issues associated with implementation of each innovation but they were less likely to develop a balanced discussion.

Paper 2

Candidates were required to attempt two of the six elective questions in this section if they had not presented a Research Project. Approximately 93% of candidates who sat Paper 1 attempted Paper 2. Questions required candidates to clearly display a thorough understanding of the elective content in parts (a) and (b). Some high scoring responses described and explained points as required. Lower scoring responses provided basic outlines and discussions.

Question 1

Approximately 11% of elective candidates attempted this question on Agribusiness.

(a)   Approximately 50% of candidates were able to name 3 options but were unable to provide a detailed description. High scoring responses were able to give detailed descriptions of valid selling options.

(b)   Very few candidates were able to give examples of uses of different advisory services. Many candidates talked in general about advice farmers may need without clarifying where the advice came from. Few were able to link the information from the advisory service to the decisions made on the farm.

(c)   High scoring responses evaluated the impact of large organisations on production and marketing for a stated product. Many responses were general in their discussion of influences on marketing or production without specifying any industry or they listed a range of general impacts without relating them to a product.

Question 2

Approximately 77% of candidates attempted this question on Animal Management.

(a)   The vast majority of candidates successfully identified one or more strategies for ensuring the health of animals, however a significant number could not describe features of their named strategies.

(b)   High scoring responses identified a specific trait that was objectively measured. They demonstrated how objective measurements are used in animal breeding programs.

(c)   Most candidates could successfully identify three techniques used to manipulate animal reproduction. The best responses were able to evaluate techniques fully, giving judgements based on criteria. These candidates were able to weigh up the advantages and disadvantages of each technique and supply a judgment for each. Fewer candidates demonstrated an ability to list the advantages as well as the disadvantages of their identified techniques.

Question 3

Approximately 6% of candidates attempted this question relating to Horticulture.

(a)   Better responses described issues related to importing and exporting produce into and out of Australia as well as trade within Australia.

(b)   Many candidates identified a range of farm inputs and outputs but few related the level of input to the output achieved. Many responses were general and did not give specific explanations about the level of input influencing the quantity or quality of output.

(c)   Most candidates correctly outlined the changes a farm manager may make to a farm system to better meet marketing and sustainability issues but few responses made any judgements about the effects of these managerial changes/decisions.

Question 4

Approximately 9% of candidates attempted the Innovation and Diversification question.

(a)   The majority of candidates identified and accurately described three new agricultural enterprises or technologies.

(b)   Very few responses demonstrated a clear understanding of all aspects of the marketing process.

(c)   Better responses based their evaluations on criteria judgements relevant to the alternative production system or technology discussed. The majority of responses described the features of the production system or technology, and stated some positive or negative implications.

Question 5

Approximately 27% of candidates attempted this question on Plant Management.

(a)   Most candidates identified that hormones were important to plant function. Better responses could differentiate between and name three particular hormones, describing their effects. Many did not accurately connect three named hormones to definite functions in relation to manipulating plant production.

(b)   Most responses described a simple relationship between light energy, water, carbon dioxide and chlorophyll to produce glucose (sugar) and oxygen. Better responses described this photochemical reaction, producing a word/symbol chemical equation and then went on to connect this process with plant growth and development. High scoring responses clearly articulated the photosynthetic process and effectively included details about the light and dark phases.

(c)   High scoring candidates could present a critical argument for managing nutrient cycling and plant reproduction in terms of 'the value of' decision making and resource allocation for a named cropping system. Better responses described a number of activities available to managers that could cycle nutrients or affect plant reproduction. Few critically evaluated not only the degree of intervention by management but also the effect of intervention for both nutrient cycling and plant reproduction in a normal cropping system. Low scoring responses did not recognise concepts relating to nutrient cycling and most omitted to mention plant reproduction in relation to management.

Question 6

Approximately 66% of candidates attempted this question on Sustainable Management.

(a) Most respondents correctly identified innovative strategies implemented by farmers to address environmental sustainability. Higher scoring responses provided detailed descriptions of the features/characteristics of the strategies and related these to environmental sustainability.

(b) The majority of candidates identified farming practices that have led to named forms of soil degradation. Higher scoring responses demonstrated a clear understanding of the cause and effect relationship involved.

(c) Better responses included judgment on the effectiveness of Government regulations. They provided details of the effects of the regulations on the supply and quality of water in an agricultural situation. Weaker responses were only able to list some Government regulations relating to water use or quality.

Optional Research Project

Approximately 7% of the 2004 HSC Agriculture candidature submitted a research project in lieu of studying two elective topics and attempting Paper 2.

A wide range of research topics was presented and both quantitative and qualitative research methodologies were represented.

Projects that gained high marks were characterised by:
• The selection of a relevant agricultural problem
• The statement of a clear research question
• The use of appropriate 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 3,000 – 5,000 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. 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.

Higher-scoring 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 their research process.

Low-scoring 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 candidates 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.

Many projects contained poor literature reviews. These reviews were characterised by candidates presenting all the information that they had sourced about the topic in general and

were not directly related to the research question. Many candidates did not refer to previous research. It should be noted that the recency and relevance of the literature reviewed is critical. The quantity of material presented is not important. The literature review should discuss previous research in relation to the issue or problem that is the subject of the research.

Lower scoring projects were write-ups about experiments that had bad experimental design (inadequate replication, randomisation and poor attention to standardisation of conditions). Some qualitative studies used an inadequate sample size, leading to less meaningful results and then making it difficult for the student to draw conclusions and write discussions. This was particularly inexcusable when the subject of the research was a common plant, eg radishes, broad beans.
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.

Candidates undertaking surveys should be advised that there are well documented strategies and rules for designing questions. Poorer 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 doesn't merely regurgitate information obviously provided by a biometrician. The analysis must be appropriate for the data supplied.

Better projects presented good referencing in their projects with clear links from the text to the details in the reference section. Web site references should be dated. It should be noted that where a web site provides a window to a publication, the publication should be cited, not the web site. Marks were awarded to those candidates that referenced material from a wide range of sources of different types.

In the presentation of data, many candidates continue to present discontinuous scales. This makes results look more significant, but is not accurate presentation of data. Where histograms are used, candidates should be encouraged to include standard deviations or standard errors on the graph. The presentation of data should be ethical and unbiased.

Candidates should be encouraged to develop an original research question, and not one very similar to other candidates from their own centre. Journal entries also suggested the 'recycling' of project topics from a school's previous years candidates. This does not help to generate original research. Projects that centred on plants selected for quick growth rather than agricultural importance were all too common and often reflected a late start date for projects. Many projects scoring low to mid-range marks investigated questions that were extremely simplistic or were obvious in their outcome eg the effect of changing protein levels on animal growth, nitrogen fertiliser effects on plants, comparisons of common products and techniques with well-documented effects, and investigations into the effects of basic inputs. The subject of some projects reflected little knowledge of commercial agriculture by selecting a topic for investigation with little or no relevance to the real-life situation, eg the effects of dechlorinated and chlorinated water on the growth of a broadacre crop.

A number of candidates simply submitted a report, describing a topic of interest or a piece of equipment that they were interested in, without conducting any experimental investigation. These projects scored poorly.

Many of the better projects indicated in their journals that they had had regular consultation with 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 they provide an excellent window into the candidates' 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 bound with the project. Ideally they should be raw diaries, in exercise or note books, reflecting the passage of time.

Agriculture Paper 1

2004 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I			
1 (a)	1	Product study	H3.1
1 (b)	2	Product study	H3.4
1 (c)	3	Product study	H3.1
1 (d)	4	Product study	H3.2
2 (a)	1	Dynamic changes in agriculture	H1.1
2 (b)	2	Dynamic changes in agriculture	H1.1
2 (c)	3	Changes and socioeconomic impact	H1.1
3 (a)	1	Experimental method	H4.1
3 (b)	2	Experimental method	H4.1
3 (c)	2	Experimental method	H4.1
3 (d)	4	Experimental method	H4.1
Section II			
4 (a)	1	Animal nutrition	H2.2
4 (b)	2	Animal nutrition	H2.2
4 (c)	3	Animal nutrition	H2.2
4 (d)	4	Animal nutrition	H2.2
4 (e)	5	Pasture management	H2.1
5 (a)	2	Soil fertility	H2.1
5 (b)	3	Soil fertility	H2.1
5 (c)	6	Soil fertility	H2.1
5 (d)	4	Genotype/environment	H1.1
Section III			
6 (a)	5	Plant production: environment constraints and management	H2.1, H3.4
6 (b)	10	Plant production: environment constraints and management	H2.1, H3.4
7 (a)	5	Farm profitability versus sustainability	H1.1, H3.1, H3.4
7 (b)	10	Farm profitability versus sustainability	H1.1, H3.1, H3.4
8 (a)	5	Breeding systems and improved production/ethics	H2.2, H5.1
8 (b)	10	Breeding systems and improved production/ethics	H2.2, H5.1
9 (a)	5	Technological innovation and change	H3.1, H3.3
9 (b)	10	Technological innovation and change	H3.1, H3.3
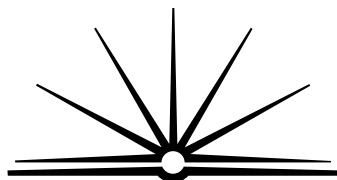
2004 HSC Agriculture Paper 1
Marking Guidelines

Section I

Question 1 (a)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Identifies ONE measure of quantity or quality of the named product	1

Question 1 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies the key features of the management practice which improves the quality/characteristics of the named product	2
• Names an on-farm management practice used in the production of the named product which improves the quality OR identifies the quality factors of the product without linking it to a management practice	1

Question 1 (c)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Describes an off-farm factor that affects quality of the named product AND describes the quality characteristic(s) of the named product, and • Makes the relationship as to how the off-farm factor affects the quality of the named product	3
• Describes an off-farm factor that affects quality of the named product AND identifies the quality characteristic(s) of the named product	2
• Identifies an off-farm factor that affects quality of the named product OR • Identifies a quality/characteristic(s) of the named product	1

Question 1 (d)

Outcomes assessed: H3.2

MARKING GUIDELINES

Criteria	Marks
• Describes a process that affects the value of a named product and explains in detail how that process leads to an increase in the value of the product	4
• Describes a process that affects the value of the named product AND explains in general terms that value increases as a result	3
• Identifies a process that affects the value of the named product AND • Identifies an increase in value of the named product OR • Describes a process that affects the value of the named product OR • Describes an increase in the value of the named product	2
• Identifies a process that affects the value of the named product OR • Identifies an increase in value of the named product	1

Question 2 (a)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
• Correctly identifies that the area planted to chickpeas has increased	1

Question 2 (b)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
• Provides features or characteristics of the factor that may have accounted for the changes in production	2
• Correctly identifies one factor that may account for the changes shown in figure 1	1

Question 2 (c)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
• Identifies some relational impacts of the issue on rural communities eg lack of income, variable income in business, impact on employment and business viability AND • Relates this to wider impacts (particularly social) of the issue across the community. Less people $\Rightarrow$ less services $\Rightarrow$ town decline/aging population etc	3
• Identifies some relational impacts of the issue on rural communities eg lack of income $\Rightarrow$ variable income in business $\Rightarrow$ impact on employment and business viability	2
• Identifies a single relationship of an identified issue on rural communities eg lower farmer incomes leads to lower community incomes	1

Question 3 (a)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• States that the control is zero fertiliser OR • The existing district recommendation	1

Question 3 (b)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies control as a comparison for treatments and relates it to this specific trial	2
• General statement of control as a base for comparison with other treatments	1

Question 3 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Demonstrates randomisation by use of treatment values and has at least three replicates showing a good understanding of replication	2
• Demonstrates randomisation but insufficient replication OR • Minimum replication but no randomisation	1

Question 3 (d)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Outlines TWO investigations that could be carried out AND • Gives reasons for carrying out these TWO further investigations	4
• Outlines ONE investigation that could be carried out AND • Gives reasons for investigations that could be carried out	3
• Outlines TWO additional investigations that could be carried out OR • Outlines ONE additional investigation and provides the reason why this additional investigation is important/needed	2
• Outlines ONE additional investigation that could be carried out	1

Question 4 (a)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Identifies the changes in proportions of hay and grain	2
• Identifies changes in the proportion of hay OR grain	1

Question 4 (b)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Provides a description of some process of rumination in cattle	2
• Identifies a feature such as rumen or cellulose breakdown, or microbes that break down hay	1

Question 4 (c)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Clearly relates that high levels of grain fed too early/quickly may cause imbalances in microbial populations and/or cause grain poisoning/acidosis in the animal OR • Clearly relates that hay in the ration can assist in maintaining the rumination process and/or suitable microbial populations thus avoiding feeding problems for the animals	3
• Outlines the role of hay and/or grain in the diet and the digestive process in the rumen OR • Suggests that feeding lower levels of grain/high levels of hay initially may impact on the microbial populations in the rumen OR • Describes feeding grain levels (higher/lower) changes production levels	2
• Identifies that higher levels of grain may cause some kind of feeding problem for the animal OR • Identifies that higher levels of hay may help avoid a feeding problem for the animal OR • Identifies that levels of grain feeding change production levels	1

Question 4 (d)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of at least ONE practice that manages nutritional requirements AND • Links this practice to the production cycle	3
• Provides characteristics and features of ONE practice that manages nutritional requirements without clearly linking to the production cycle	2
• Identifies ONE practice that manages nutritional requirements OR • Identifies a stage in production that need nutritional management	1

Question 4 (e)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Describes advantages and/or disadvantages of introduced and native pasture species in relation to production goals and sustainability AND • Makes some judgement about the value of their effectiveness/use in terms of a production system	5
• Describes advantages and/or disadvantages of introduced and native pasture species in relation to both production goals and pastures sustainability OR • Describes and makes some judgement about introduced and/or native pasture species in relation to one of the areas	3–4
• Identifies at least ONE advantage and/or disadvantage of both native and/or introduced pasture species • Makes a link to production goals OR sustainable pastures	1–2

Question 5 (a)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Lists FOUR soil nutrients	2
• Lists THREE soil nutrients OR • Lists TWO soil nutrients	1

Question 5 (b)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Clearly identifies a factor and relates the cause with the effect ie how the factor limits or enhances the availability of a named soil nutrient	3
• Clearly identifies a factor and its effect on the availability of plant nutrient(s)	2
• States a factor that affects the availability of a nutrient	1

Question 5 (c)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Identifies points for and/or against the use of two named organic methods of improving soil fertility	5–6
• Identifies points for and/or against the use of one named organic method of improving fertility AND • Outlines another organic method of improving soil fertility OR • Describes two organic methods of improving soil fertility	3–4
• Outlines one organic method of improving soil fertility AND • Lists one other organic method OR • Lists two organic methods of improving soil fertility	1–2

Question 5 (d)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a suitable genetic manipulation and clearly indicates how this manipulation results in a change in production or quality of a plant production system	4
• Identifies a suitable genetic manipulation and links it with a change in production or quality of a plant production system	3
• Identifies a suitable genetic manipulation and identifies a change in production or quality of plants OR • Describes changes in production without specifically identifying the genetic manipulation	2
• Identifies a genetic manipulation OR identifies a change in production or quality of plants	1

Section III

Question 6 (a)

Outcomes assessed: H2.1, H3.4

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of the effect of THREE environmental factors on a plant production system	5
• Identifies THREE environmental factors that affect a plant production system OR • Provides characteristics and features of the effect of ONE or TWO environmental factors on a plant production system	3–4
• Identifies ONE or TWO factors that affect plant production systems	1–2

Question 6 (b)

Outcomes assessed: H2.1, H3.4

MARKING GUIDELINES

Criteria	Marks
• For each environmental factor, identifies ONE management strategy and gives the key features of the management strategy AND • Outlines the advantages and/or disadvantages of the THREE management strategies on plant production	9–10
• For at least two environmental factors, identifies ONE management strategy and gives the key features of the management strategies AND • Outlines the advantages and/or disadvantages of at least ONE of the management strategies on plant production	7–8
• For at least two environmental factors, identifies ONE management strategy and gives the key features of the management strategy AND • Outlines how the management practices modify the impact on each of the environmental factors	5–6
• For at least two environmental factors, identifies ONE management strategy and gives the key features of the management strategy	3–4
• Identifies ONE or TWO management strategies for a corresponding environmental factor	1–2

Question 7 (a)

Outcomes assessed: H1.1, H3.1, H3.4

MARKING GUIDELINES

Criteria	Marks
• Provides the characteristics and features of THREE factors that impact on profitability	5
• Provides the characteristics and features of up to TWO factors that impact on profitability • Identifies the remaining factor(s) up to three	3–4
• Identifies up to TWO factors that impact on profitability	1–2

Question 7 (b)

Outcomes assessed: H1.1, H3.1, H3.4

MARKING GUIDELINES

Criteria	Marks
• Links each decision to both profitability and long term sustainability AND • Provides detailed relationships between each decision and how these changes may change profitability AND • Identifies issues and provides points for and against the impact of these decisions on long term sustainability	9–10
• Links each decision to both profitability and long term sustainability AND • Provides detailed relationships between the decisions and how these changes may change profitability AND • Identifies an issue that relates to each decision on long term sustainability	7–8
• Describes at least ONE decision for each of the three factors and links each decision to profitability and/or long term sustainability AND • Identifies an issue that relates to long term sustainability	5–6
• Identifies at least ONE decision for each of the three factors AND • Makes links for some of these decisions to profitability and/or long term sustainability	3–4
• Identifies some decisions for at least ONE of the factors AND • Makes some link between the identified decision and profitability and/or long term sustainability	1–2

Question 8 (a)

Outcomes assessed: H2.2, H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides the characteristics and key features of TWO changes in consumer preferences	5
• Outlines TWO changes in consumer preferences (4) • Outlines ONE change in consumer preference and identifies another change (3)	3–4
• Identifies ONE or TWO changes in consumer preferences OR • Outlines ONE change in consumer preference	1–2

Question 8 (b)

Outcomes assessed: H2.2, H5.1

MARKING GUIDELINES

Criteria	Marks
• Makes clear relationships between three described management strategies that farmers and/or industry have put in place and the identified changed consumer preferences • Identifies valid points for and against for more than one legal and/or ethical issue in the marketing chain	9–10
• Describes two strategies and identifies one other management strategy that farmers and/or industry have put in place to meet the changed consumer preference • Identifies some points for and against for more than one legal and/or ethical issue in the marketing chain	7–8
• Identifies three or outlines two management strategies that farmers and/or industry have put in place to meet the changed consumer preference • Provides some points for and against one legal and/or ethical issue in the marketing chain and identifies another legal/ethical issue	5–6
• Identifies two or outlines one management strategy that farmers and/or industry have put in place to meet the changed consumer preference • Identifies more than one or provides points for and against one legal or ethical issue that farmers and/or industry need to address in the production and marketing chain	3–4
• Identifies at least one management strategy that farmers and/or industry have put in place to meet the changed consumer preference • Identifies an ethical or legal issue that farmers and/or industry need to address in the production and marketing chain	1–2

Question 9 (a)

Outcomes assessed: H3.1, H3.3

MARKING GUIDELINES

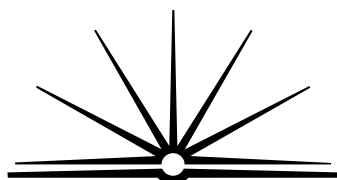| Criteria	Marks
• Provides the key characteristics of THREE technological innovations in production systems	5
• Provides the key characteristics of up to TWO examples of technological innovations in production systems OR • Identifies THREE technological innovations	3–4
• Identifies up to TWO examples of technological innovation in production systems	1–2

Question 9 (b)

Outcomes assessed: H3.1, H3.3

MARKING GUIDELINES

Criteria	Marks
• Describes a link between the three innovation and production/marketing goals AND relates how the innovation affects the marketing/production goals AND • Provides positive and negative issues associated with the implementation of each innovation	9–10
• Describes a link between the three innovations and a production/marketing goal AND relates how the innovation affects the marketing/production goals AND • Outlines at least one implementation issue for each of the innovations	7–8
• Identifies a link between the three innovations and a production/marketing goal AND • Outlines at least one implementation issue for two of the innovations	5–6
• Identifies a link between at least two of the innovations to a production/marketing goal AND • Identifies at least one implementation issue for one of the innovations	3–4
• Identifies a link between at least one of the innovations to a production/marketing goal AND • Identifies at least one implementation issue for one of the innovations	1–2

Agriculture Paper 2
2004 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Question 1 — Agribusiness			
1 (a)	3	Agribusiness: innovation/ethics	H5.1
1 (b)	4	Process management	H3.4
1 (c)	8	Process management	H3.4
Question 2 — Animal Management			
2 (a)	3	Animal management: innovation/ethics	H5.1
2 (b)	4	Process management	H3.4
2 (c)	8	Process management	H3.4
Question 3 — Horticulture			
3 (a)	3	Horticulture: innovation/ethics	H5.1
3 (b)	4	Process management	H3.4
3 (c)	8	Process management	H3.4
Question 4 — Innovation and Diversification			
4 (a)	3	Innovation and diversification: innovation/ethics	H5.1
4 (b)	4	Process management	H3.4
4 (c)	8	Process management	H3.4
Question 5 — Plant Management			
5 (a)	3	Plant management: innovation/ethics	H5.1
5 (b)	4	Process management	H3.4
5 (c)	8	Process management	H3.4
Question 6 — Sustainable Land and Resource Management			
6 (a)	3	Land and resource management; innovation/ethics	H5.1
6 (b)	4	Process management	H3.4
6 (c)	8	Process management	H3.4

2004 HSC Agriculture Paper 2
Marking Guidelines

Question 1 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of THREE selling options for a particular product	3
• Provides characteristics and features of TWO selling options for a particular product OR • Provides characteristics and features of ONE option and lists two others	2
• Provides characteristics and features of ONE selling option OR • Lists at least TWO selling options	1

Question 1 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies TWO uses of farm advisory services AND relates the way in which each aids in providing information and assists decision making of the farmer	4
• Identifies TWO uses of farm advisory services AND outlines briefly the use of each to the farmer	3
• Identifies TWO uses of farm advisory services	2
• Identifies ONE use of farm advisory services	1

Question 1 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes positive and negative impacts of large organisations and companies in both production and marketing of a specific product and makes a clear value judgement of the associated impacts of such involvement on both production and marketing	7–8
• Describes positive and negative impact/s of large organisations or companies on production and marketing and makes a value judgement of the associated impacts of such involvement on either production or marketing	5–6
• Describes positive and negative impacts of large organisations or companies on production OR marketing	3–4
• Briefly outlines impact/s on either production or marketing of a large company	1–2

Question 2 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of THREE strategies used to keep livestock healthy	3
• Provides characteristics and features of TWO strategies used to keep livestock healthy OR • Provides characteristics and features of ONE and states TWO other strategies	2
• Provides characteristics and features of ONE strategy OR • Lists TWO strategies	1

Question 2 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies an appropriate trait that can be quantified and measured, outlines how this trait is important for the animal industry and relates selection being used in breeding programs (eg Breedplan) to increase the expression of the desirable trait	4
• Identifies a trait and describes the process of objective measurement and its use in breeding programs	3
• Identifies a trait and outlines objective measurement in general terms	2
• States meaning of objective measurement OR • Identifies an appropriate trait that can be measured	1

Question 2 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes advantages and disadvantages of the use of THREE management techniques, making a clear value judgement on the use of each of these techniques	7–8
• Describes advantages and disadvantages of THREE management techniques used to manipulate reproduction, attempts to evaluate for TWO of these techniques	5–6
• Outlines TWO management techniques used to manipulate reproduction and/or attempts to evaluate the use of ONE of these techniques	3–4
• Identifies TWO management techniques used to manipulate reproduction OR • Briefly outlines ONE technique	1–2

Question 3 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of THREE impacts of quarantine	3
• Provides characteristics and features of TWO impacts of quarantine OR • Provides characteristics and features of ONE impact of quarantine and lists TWO impacts of quarantine	2
• Provides characteristics and features ONE impact of quarantine OR • Lists at least TWO impacts of quarantine	1

Question 3 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes and provides reasons as to HOW at least TWO inputs are linked to the output(s)	4
• Describes and provides reasons as to HOW at least ONE input is linked to the output(s) AND • Describes at least ONE input that is linked to an output	3
• Identifies at least TWO inputs that are linked to the output(s) OR • Describes ONE input that is clearly linked to an output	2
• Identifies at least ONE input that is linked to an output	1

Question 3 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Provides positive and negative effects of the manager in supplying new or developing markets and maintaining environmental sustainability AND • Makes a judgement about the importance of the manager in the success or otherwise of market supply AND environmental sustainability	7–8
• Provides positive and negative effects of the manager supplying new or developing markets AND/OR maintaining environmental sustainability and makes a judgement about the importance of the manager in the success or otherwise of market supply OR maintaining environmental sustainability	5–6
• Outlines at least ONE thing a manager does in supplying new or developing markets AND maintaining environmental sustainability	3–4
• Outlines at least ONE thing the manager does in either supplying markets OR • Maintaining environmental sustainability	1–2

Question 4 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of THREE new agricultural enterprises or technologies	3
• Provides characteristics and features of at least TWO new agricultural enterprises or technologies OR • Provides characteristics and features of ONE new agricultural enterprise or technology and lists TWO new agricultural enterprises or technologies	2
• Provides characteristics and features of at least ONE new agricultural enterprise or technology OR • Lists TWO new agricultural enterprises or technologies	1

Question 4 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Relates the need for good marketing plans and market research and analysis to the success of new innovations in the market place AND outlines why it is important as part of the initial planning before production begins	4
• Describes some aspects of good marketing (not just selling) and links it to successful marketing of new innovations	3
• Outlines some aspects of good marketing and identifies its role in getting new innovations into the market	2
• States a feature of marketing and links it to selling an innovation	1

Question 4 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes positive and negative economic implications and environmental impacts of an alternative agricultural production system OR technological innovation AND makes a clear judgement about BOTH the economic implications and environmental impacts to indicate a preferred outcome	7–8
• Describes positive and negative economic implications and environmental impacts of an alternative agricultural production system OR technological innovation AND makes a clear judgement about EITHER the economic implications OR environmental impacts to indicate a preferred outcome	5–6
• Describes positive and negative economic implications and environmental impacts of an alternative agricultural production system OR technological innovation	3–4
• Briefly outlines economic implications OR environmental impacts of an alternative agricultural system OR technological innovation	1–2

Question 5 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of THREE ways hormones manipulate plant growth and/or development	3
• Provides characteristics and features of TWO ways hormones manipulate plant growth and/or development OR • Provides characteristics and features of ONE way hormones manipulate plant growth and lists TWO ways hormones manipulate plant growth and/or development	2
• Provides characteristics and features of ONE way hormones manipulate plant growth and/or development OR • Lists TWO ways hormones manipulate plant growth and/or development	1

Question 5 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes the process of photosynthesis and clearly relates this to plant growth processes	4
• Describes the process of photosynthesis and the inputs and outputs involved	3
• Outlines in general terms some of the processes of photosynthesis and/or inputs/outputs of photosynthesis OR • Outlines plant growth in general terms	2
• Identifies some of the inputs and/or outputs of photosynthesis	1

Question 5 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes positive and negative effects of management on both nutrient cycling and plant reproduction for a studied cropping system AND • Makes a clear value judgement about the effect of management upon both nutrient cycling and plant reproduction	7-8
• Describes positive and negative effects of management on both nutrient cycling and plant reproduction for a studied cropping system AND • Makes a clear value judgement about the effect of management upon EITHER nutrient cycling OR plant reproduction	5-6
• Describes effects of management on EITHER nutrient cycling or plant reproduction for a studied cropping system	3–4
• Briefly outlines effects of management on either nutrient cycling OR plant reproduction for a cropping system	1–2

Question 6 (a)

Outcomes assessed: H5.1

MARKING GUIDELINES

Criteria	Marks
• Provides characteristics and features of at least THREE strategies that have been implemented to deal with sustainability in agriculture	3
• Provides characteristics and features of TWO strategies OR • Provides characteristics and features of ONE strategy and lists TWO other strategies	2
• Provides characteristics and features of ONE strategy OR • Lists at least TWO strategies	1

Question 6 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes at least TWO management practices that have led to soil degradation and relates these causes to the effects of degradation	4
• Describes ONE management practice, relating this to the onset of soil degradation and identifies one other management practice that has led to soil degradation	3
• Outlines ONE management practice and relates this to causes of soil degradation OR • Identifies TWO management practices that have led to soil degradation	2
• Identifies ONE management practice that has led to one form of soil degradation	1

Question 6 (c)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes positive and negative effects of government regulations on BOTH the supply of water and quality of water AND • Makes a clear value judgement about the effectiveness of government regulations on BOTH supply and quality of water	7–8
• Describes positive and negative effects of government regulations on BOTH the supply of water and quality of water AND • Makes a clear judgement about the effectiveness of government regulations on EITHER supply OR quality of water	5–6
• Describes positive and negative effects of government regulations on EITHER the supply of water OR quality of water	3–4
• Briefly outlines effects of government regulations on EITHER the supply of water OR quality of water	1–2