2003 HSC Notes from the Marking Centre Agriculture

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2003 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 2003 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 2003 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 2003, 1288 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, sustainable chemical use, experimental procedure and interpretation of data. Generally candidates performed well, demonstrating a sound understanding of the quality criteria and marketing of the product they selected. An ability to correctly interpret tabulated data was also evident. Responses indicated that candidates have a good grasp of experimental design and its application.

Candidates satisfactorily interpreted questions and responded appropriately to key words. More limited responses reflected an inability to adequately 'explain' or 'discuss' as required.

Question 1

(a) (i) A relevant measure of quality for the named product was correctly identified by the majority of candidates.
(ii) Most candidates were able to identify two appropriate marketing strategies available to the farmer. Better responses suitably outlined the two nominated strategies. Lower scoring responses outlined only one of the strategies or could not initially identify more than one relevant marketing strategy.

(b) (iii) High scoring responses identified a relevant advance in technology and explained how the technology improved an appropriate aspect of product quality or quantity.
Many candidates identified an advance in technology but did not provide a detailed link to improvements in product quality or quantity.

(c) The majority of candidates identified an appropriate strategy to manage irregular income. Highest scoring responses provided a detailed description of the strategy and discussed advantages and disadvantages associated with it in the management of irregular income. Poorer responses outlined a strategy but did not include any discussion.

Question 2

(a) Most candidates scored full marks for this part, concluding that there was relationship between high application rate of herbicide and high levels of resistance in ryegrass.
Poorer responses did not identify this relationship and merely re-stated results from the table. It was noted that a significant number of candidates referred to the ryegrass as a pest comparable to an insect and confused glyphosate herbicide with phosphate fertiliser.

(b) Better responses demonstrated an understanding of the development of resistance through the process of natural selection. Many candidates referred incorrectly to the development of 'immunity' rather than resistance and/or described the development of 'tolerance' to a herbicide within a single generation.

(c) A limited number of candidates scored full marks in this part. Those who did, correctly identified one or more alternative strategies then discussed their advantages and disadvantages or compared and contrasted the effect of the strategies. Those answers gaining maximum marks always included a value judgement in relation to the strategy's influence in slowing the development of resistance.
Lower scoring responses mentioned IPM only as an alternative and did not include an adequate evaluation. Many candidates referred to changing dose rate or time of application while still using one chemical only, missing the point of the question.

Question 3

(a) The majority of candidates correctly identified the effect of irrigation intervals on potato moth infection and total yield using the experimental data provided.

(b) Many responses provided an appropriate proposal for an irrigation interval. Most candidates were able to adequately justify their choice, relating to moth infection rates, potato yield and relative labour costs of the various irrigation intervals investigated. A significant number of candidates identified intervals outside the range of the data provided. They were then unable to justify their choice based on the information available. A number of candidates focused on the effect of the amount of water used, despite the question indicating that the same total amount of water was involved in each strategy.

(c) Generally this part was well answered. Most candidates were able to identify two experimental procedures and explain how each contributed to ensuring the validity of trial results.

Section II

This compulsory section focuses on the plant and animal content of the syllabus. Question 4 was animal based and Question 5 related to plants.

Question 4

(a) This question was well answered by most candidates. The majority of responses scored full marks by identifying a hormone and correctly outlining its role in animal behaviour.
(b) Most responses used an appropriate example to describe the effect of an environmental factor on animal fertility. There was some confusion amongst candidates about whether the example related to the 'environmental factor' or the 'fertility factor'.
(c) The majority of candidates scored in the mid to high range for this question. Some candidates misread the word 'reproduction' as 'production' and their answers were then not relevant.
(d) Those candidates who demonstrated an understanding of the interaction between different hormones in regulating the oestrus cycle scored highly. The use of 'feed back' diagrams was common in such answers. A number of candidates interpreted the question as farmer manipulation of oestrus rather than natural hormonal regulation of oestrus. Generally candidates displayed a low level of understanding of hormones involved and their interaction to regulate oestrus. A significant number of candidates did not attempt this question.

Question 5

(a) Highest scoring responses clearly described an example of interference resulting in a change of plant growth. Poorer responses did not link interference to a subsequent change in the plant growth and many answers were very superficial. The word 'interference' led many candidates to use an example of a negative response. Examples of positive interference rarely appeared in the responses.
(b) This question was well answered by most candidates. Candidates outlined a valid reason for vegetable rotation and its subsequent benefits over time. Many candidates failed to read the word ONE. Two or more reasons were often given.
(c) Most candidates were able to identify two benefits; the highest scoring responses provided a suitable explanation of each. Many candidates however responded in general terms and tended to outline rather than explain the benefits.
(d) Highest scoring candidates discussed in depth economic and environmental sustainability possible as a consequence of adopting such a system. The better responses integrated both concepts ie environmental sustainability leads into economic sustainability. Mid-range responses discussed factors separately or concentrated on one only. A number of responses scored in the low range as they provided an outline rather than a discussion.

Section III

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

Generally, candidate performance was good in part (a) of each question. 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. Few provided adequate evaluation on specific issues using the scaffold provided in the question. This was necessary to achieve in the higher performance ranges. Many candidates did not adequately consider the 'evaluate' component of the questions.

Question 6

Approximately 35% of candidates attempted this question.

(a) The majority of candidates gave a good description of the conditions leading to the existence of a disease. A large percentage of responses were limited to a very small number of farm diseases (eg liverfluke and flystrike). The best responses tied together the relationships between the three elements of the disease triangle. Poorer responses outlined general conditions not related to the disease triangle and included no specific examples.
(b) A significant number of students were able to give a full description for a specific IPM program, with the top candidates critically evaluating their chosen program in terms of the 3 criteria with supported and detailed judgements. Generally, candidates provided only a limited evaluation. The provision of current and accurate industry examples would often lead to a more interesting response.

Question 7

Approximately 48% of candidates attempted this question.

(a) The majority of students could identify and adequately describe two farming practices and how each caused environmental damage. Best responses clearly illustrated the link between the practice and the resulting damage using an appropriate example.
(b) Most candidates identified and briefly described alternative uses of water but failed to describe the tension that exists between water use and conservation or protection. A high proportion of responses did not provide an evaluation of how this tension is being addressed by the three groups identified in the question ie farmers, community and government. Some candidates were able to assess the issues relating to one or two of the groups to some degree but it was uncommon for all three groups to be considered in an adequate evaluation.

Question 8

Approximately 11% of candidates attempted this question.

(a) Most candidates answered this part well with the majority of candidates able to describe the stages of bone, muscle and fat formation. Better candidates were able to link this to stage of growth and development of a farm animal.
(b) The majority of candidates were able to describe a nutritional strategy to meet a product specification. Some better responses were able to evaluate the strategy in terms of cost involved and market price. A number of responses did not address the success of goal achievement.

Question 9

Approximately 5% of candidates attempted this question.

(a) The majority of candidates were able to describe a breeding system. Most responses failed to also describe the problem in the production system. Few were able to explain the relationship between an identified problem in a plant production system and the selected breeding system. Better responses included relevant examples from industry and clearly linked the problem with the breeding systems.

(b) A significant number of candidates were able to identify three characteristics that have been bred in agricultural plants but failed to develop their description into a valid evaluation. Those that provided evaluations failed to support their arguments qualitatively and quantitatively. Poorer responses gave generalised characteristics and evaluations loosely related to the question.

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 94% of candidates who sat Paper 1 attempted Paper 2. Questions required candidates to describe and explain processes involved in key areas of their elective study. Students are expected to study a relevant piece of research conducted in each topic area. The question for each elective, based on this research study, required a description of the research and an assessment of research methodology, data analysis and presentation and conclusions and recommendations.

A significant number of responses could have more clearly displayed 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.

Part (c) in general was poorly answered. In many cases it was evident that the analysis of an appropriate study or piece of research in each elective area had not been effectively undertaken. Where a piece of research or a study was the basis of a response, an outline of a simple trial was often included rather than a study relevant to the elective topic.

Question 1

Approximately 9% of elective candidates attempted this question on Agribusiness.

(a) Most candidates could identify a financial technique. The description of techniques in many cases was simplistic. Highest scoring responses clearly linked a well described technique to a change or expansion in an enterprise.
(b) The majority of candidates could identify a strategy to obtain finance from an institution. A significant number provided an outline of the strategy. Fewer candidates were able to score highly by linking the strategy described to a planned enterprise change.
(c) A significantly small number of candidates described a study that involved a research component. Those few high scoring responses clearly identified, described and made relevant judgements on a research study that investigated an organisation's impact on an agricultural industry.
Most candidates focused on the description of a rural business organisation's operations. The lack of discussion of a research study resulted in an inability to make any evaluation based on the criteria.

Question 2

Approximately 71% of candidates attempted this question on Animal Management.

(a) The majority of responses included an identification of a reproductive technique; however many candidates had difficulty in describing it. Some candidates confused the concept of reproductive outcomes with either marketing or production outcomes.

(b) Many candidates were unable to identify an objective measurement. A significant number of candidates confused objective measurements with breeding techniques, such as artificial insemination. Often candidates used general terms such as EBV and Breedplan, rather than explaining the measurement within these systems. Better candidates outlined a specific objective measurement and linked it to market specifications.
(c) There were a significant number of poor responses for this part. Few used the dot point scaffold provided in the question to frame their answer. Generally, candidates did not understand how to evaluate the research, so many of those who described the components of the research design failed to make any judgements about it, and instead outlined recommendations from the study.

Question 3

Approximately 10% of candidates attempted this question relating to Horticulture.

(a) Most candidates were able to identify at least one plant characteristic, although many failed to link the characteristic with its use in horticulture.
(b) The majority of candidates failed to identify a plant physiological process. Many candidates were able to describe how processes could be manipulated but they often failed to link this manipulation to increased productivity in horticultural systems.
(c) Few candidates used the dot point scaffold in the question to assist them in writing their response. The majority of candidates were able to identify a topic suitable for research, however many candidates were unable to identify a study or outline the research methodology involved. Few candidates were able to evaluate the research methodology.

Question 4

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

(a) The majority of the candidates were able to identify a biological feature of a plant or animal. The majority of the candidates were able to link the biological feature to the management process but few described this feature satisfactorily.
(b) Many candidates restated the sentiments in the question giving a general treatise on marketing without giving specific examples of how alternative production systems have special marketing needs. Only a few candidates mentioned appropriate marketing vehicles including surveys, newspaper advertisements, taste tests. Very few candidates linked the marketing techniques to appropriate management strategies for optimising market returns.
(c) Most candidates were able to identify a suitable research study. Many candidates were able to describe certain aspects of the study but few were able to make critical evaluations about any aspects of the study. Candidates needed to make a judgement about the validity of the research design, data analysis, conclusion and recommendations. A judgement could include both positive and negative comments about the study. These comments needed to have appropriate justification/substantiation on each aspect of experimental design (ie why was it poor or why was it a good study).

Question 5

Approximately 35% of candidates attempted this question on Plant Management.

(a) Most candidates were able to identify the effect of planting density on the vegetative or reproductive yield of plants. Very few responses were able to describe how both vegetative and reproductive yield are affected by plant density.
(b) A majority of responses were able to identify two environmental factors that limit photosynthesis. Most responses did not relate the effect of two environmental factors that may limit the physiological process of photosynthesis.
(c) Many candidates were able to identify a current research study in plant management. Some candidates were able to describe the components that make up the research study. Very few responses were able to evaluate the various components of a research study. Far too many candidates did not identify a research study correctly. Rather, they wrote in general terms about designing and conducting an experiment of their own.

Question 6

Approximately 65% of candidates attempted this question on Sustainable Management.

(a) Many candidates answered this part of the question in detail, and demonstrated a clear understanding of the question. The majority of responses identified a practice that led to degradation. Better responses included more than one practice and linked these to degradation.
(b) Most candidates identified a soil process and provided a link to the effects on plant growth. Higher scoring candidates described how the process caused further soil degradation.
(c) Many candidates identified a research study or a form of innovation that involved water use in agriculture. Better candidates provided detail of the components in a study. Few candidates could substantiate their judgements about the research.

Optional Research Project

Approximately 6% of the 2003 HSC Agriculture candidature submitted the research project.

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.

Low-scoring projects often 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.

In general, 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 chosen research.

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.

Many of the projects that scored low marks simply described experiments that demonstrated poor ex
perimental design eg inadequate replication and poor attention to standardisation of conditions. This then hindered the analysis of the results and the development of meaningful conclusions. Projects with such flaws rarely acknowledged these or provided suitable recommendations to rectify them in future research.

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.

Many candidates presented poor referencing in their projects. 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. Marks were awarded to those candidates that referenced material from a wide range of sources.

In the presentation of data, many candidates continue to present discontinuous scales. This makes results look more significant, but is not an 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 of candidates from a school's previous years. 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 starting 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.

A number of candidates 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.

In many of the better projects, candidates 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.

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.

Agriculture Paper 1

2003 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
Section I			
1 (a) (i)	1	Quality of product	H3.1
1 (a) (ii)	2	Marketing of product	H3.2
1 (a) (iii)	3	Technology and product quality	H3.3
1 (b)	4	Managing irregular income	H3.1
2 (a)	1	Management processes	H3.4
2 (b)	2	Resistance in population	H1.1
2 (c)	3	Resistance in population	H3.4
3 (a)	2	Experimental technique	H4.1
3 (b)	3	Experimental technique	H4.1
3 (c)	4	Experimental technique	H4.1
Section II			
4 (a)	2	Role of animal hormones	H2.2
4 (b)	3	Animal fertility	H2.2
4 (c)	4	Timing of reproduction	H1.1, H2.2
4 (d)	6	Hormones in oestrus	H2.2
5 (a)	2	Interference in plants	H2.1
5 (b)	3	Managing rotation	H2.1
5 (c)	4	Management systems for plants	H2.1, H3.4
5 (d)	6	Management outcomes and impacts of plant systems	H3.4
Section III			
6 (a)	5	Disease	H2.1, H2.2
6 (b)	10	IPM programs	H2.1, H2.2
7 (a)	5	Farm practices and environment	H1.1, H2.1, H2.2
7 (b)	10	Environmental management of water in Ag.	H1.1, H2.1, H2.2, H3.4
8 (a)	5	Growth and development in animals	H2.2
8 (b)	10	Animal nutrition	H2.2, H3.1
9 (a)	5	Plant Breeding	H2.1
9 (b)	10	Impact plant breeding/innovation	H2.1, H5.1

BOARD OF STUDIES
NEW SOUTH WALES

2003 HSC Agriculture
Marking Guidelines
Paper 1

Section I

Question 1 (a) (i)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Identifies one measure of quality	1

Question 1 (a) (ii)

Outcomes assessed: H3.2

MARKING GUIDELINES

Criteria	Marks
• Indicates the main feature of two ways the named product can be marketed	2
• Indicates the main feature of one way the named product can be marketed OR • Identifies two ways of marketing	1

Question 1 (a) (iii)

Outcomes assessed: H3.3

MARKING GUIDELINES

Criteria	Marks
• Identifies the technological advance • Relates the effect of the technology to the quality or quantity of the product • Indicates how the technology improves the quality or quantity of the product	3
• Identifies the technological advance • Relates the effect of the technology to the quality or quantity of the product OR • Indicates how the technology improves the quality/quantity of the product	2
• Identifies the technological advance	1

Question 1 (b)

Outcomes assessed: H3.1

MARKING GUIDELINES

Criteria	Marks
• Identifies and describes an appropriate strategy to manage the irregular income • Provides detail of advantages and/or disadvantages that may arise from using this strategy over time	4
• Identifies and describes an appropriate strategy to manage the irregular income • Identifies advantages and/or disadvantages that may arise from using this strategy	3
• Identifies and describes an appropriate strategy to manage the irregular income	2
• Identifies an appropriate strategy to manage the irregular income	1

Question 2 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies that the higher frequency of use of herbicide increases the resistant populations of ryegrass (ie a generalisation) OR • Uses a specific example to outline the concept of increasing resistance	1

Question 2 (b)

Outcomes assessed: H1.1

MARKING GUIDELINES

Criteria	Marks
• Identifies that some ryegrass plants will be resistant to the herbicide and hence survive • Recognises that these resistant plants will survive and become dominant more quickly as herbicide rate increases because conditions favour them over the susceptible plants	2
• Identifies that some ryegrass plants will be resistant to the herbicide and hence survive	1

Question 2 (c)

Outcomes assessed: H3.4

Criteria	Marks
• Identifies and describes a suitable alternative approach for control • Determines the value of the suitability of the approach in relation to the development of resistance and any other related or unrelated outcomes	3
• Identifies and describes a suitable alternative approach for control	2
• Identifies an alternative approach for control	1

Question 3 (a)

Outcomes assessed: H4.1

Criteria	Marks
• Identifies two valid conclusions	2
• Identifies one valid conclusion	1

Question 3 (b)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Provides an appropriate proposal • Supports a recommendation with an appropriate argument relating to both moth infection and potato yield or identifies additional factors to justify	3
• Provides an appropriate proposal with a simple linear justification based on only restating data in the table	2
• Lists an irrigation interval within the range of the data	1

Question 3 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies two procedures • Provides why and/or how both procedures increase validity of the data from scientific experimental design	4
• Identifies two procedures, and • Provides why and/or how one of the procedures increases validity of the data from scientific experimental design OR • Two procedures with outlines of what they involve	3
• Identifies two procedures OR • Identifies one procedure with an outline of what it involves	2
• Identifies one procedure	1

Section II

Question 4 (a)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Identifies a hormone involved in animal behaviour • Links the identified hormone to a particular behaviour	2
• Identifies a hormone or an animal behaviour	1

Question 4 (b)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Identifies one environmental factor that affects the fertility of a particular farm animal • Quantifies the environmental factor and/or its specific effect and relates this to a specific fertility outcome OR • Makes clear links between the environmental factor and a specific fertility outcome	3
• Identifies one environmental factor that affects the fertility of a particular farm animal • Relates the environmental factor to fertility	2
• Identifies one environmental factor that affects the fertility of a particular farm animal	1

Question 4 (c)

Outcomes assessed: H1.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Clearly relates, using an example or measure, production goals with financial returns • Shows how management practice is used to meet the production goals	4
• Links the management practice to increased production and financial returns	3
• Outlines a management practice involved in farm animal reproduction	2
• Identifies a management practice involved in farm animal reproduction	1

Question 4 (d)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Names at least three major hormones of the oestrus cycle and states the functions of the hormones • Describes a sequence of events involving hormones and their effects on reproductive organs • Relates hormone levels as a part of a feedback mechanism which controls and maintains the oestrus cycle	5–6
• Names at least two hormones of the oestrus cycle • Describes in general terms that hormones interact with reproductive organs and that hormones change in levels in some sort of sequence	3–4
• Names at least one hormone in the oestrus cycle • Identifies that hormones initiate and are important in events in oestrus	1–2

Question 5 (a)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a way that the lucerne and vegetable plants may interfere with each other • Provides some detail about the named interference and its effect/implied effect on growth	2
• Identifies a way that the lucerne and vegetable plants may interfere with each other	1

Question 5 (b)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Outlines the reason for the rotation and makes explicit the relationship between the reason and the processes involved	3
• Outlines a reason for rotating the type of vegetables grown	2
• Identifies one reason for rotating the type of vegetables grown	1

Question 5 (c)

Outcomes assessed: H2.1, 3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies two benefits of alley cropping • Relates the cause and effects of both of these benefits and details how they are beneficial	4
• Identifies at least one benefit of alley cropping • Relates the cause and effect of one benefit of alley cropping in detail with one benefit identified or poorly explained	3
• Identifies two benefits of alley cropping	2
• Identifies one benefit of alley cropping OR • Names two benefits of alley cropping	1

Question 5 (d)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Identifies some of the economic and environmental issues/impacts, relating to the sustainability of alley cropping (or other cropping system) • Provides points for and/or against the use of alley cropping (or other cropping system) related to the economic and environmental issues/impacts identified	5–6
• Describes at least one economic and one environmental issue/impact, relating to the sustainability of alley cropping (or other cropping system) OR • Identifies one economic or one environmental issue/impact, and, • Provides points for and/or against the use of alley cropping (or other cropping system) for the identified issue/impact	3–4
• Identifies one economic and one environmental, or two environmental, or two economic, issues/impacts of alley cropping (or other cropping system)	2
• Identifies one issue/impact of alley cropping (or other cropping system)	1

Section III

Question 6 (a)

Outcomes assessed: H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Describes conditions leading to disease with specific examples drawn from each of the three areas of host, pathogen and environment • Describes the need for the interaction of favourable environment, susceptible host and virulent pathogen for disease to occur	5
• Describes conditions leading to disease with specific examples drawn from two or three areas of: host, pathogen and environment	3–4
• Identifies some conditions that can lead to a disease	1–2

Question 6 (b)

Outcomes assessed: H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Accurately describes the major elements of a named IPM program; includes strategic issues associated with its success eg. timing, seasonal conditions, monitoring • Outlines issues associated with each of the three criteria • Makes supported and detailed judgements related to all of the criteria	9–10
• Accurately describes the major elements of a named IPM program; includes strategic issues associated with its success eg. timing, seasonal conditions, monitoring • Outlines issues associated with each of the three criteria • Makes judgements about the outcomes of the program	7–8
• Describes the major components of a named IPM program • Outlines issues associated with one or two of the criteria associated with some superficial evaluation	5–6
• Identifies/outlines the major components of a named IPM program • Outlines issues associated with one or two of the criteria	3–4
• Identifies/outlines the major components of a named IPM program	1–2

Question 7 (a)

Outcomes assessed: H1.1, H2.1, H2.2

MARKING GUIDELINES

Criteria	Marks
• Describes two farming practices and relates these to descriptions of specific environmental damage	5
• Describes two farming practices and identifies the environmental outcome of each	3–4
• Identifies one or two farming practices that are related to environmental damage	1–2

Question 7 (b)

Outcomes assessed:H1.1, H2.1, H2.2, H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes alternative uses of water and links this to the creation of tension/debates between different users • Evaluation across the three areas is done in detail with multiple aspects of each	9–10
• Describes alternative uses of water and links this to the creation of tension/debates between different users • Evaluation across at least two areas and at least one is done in some detail. Detail includes looking at multiple aspects of each of the areas evaluated	7–8
• Describes alternative uses of water and links this to the creation of tension/debates between different users • Superficial evaluation but not across the three areas of farmers, community and government	5–6
• Describes alternative uses of water and links this to the creation of tension/debates between different users • Little or no evaluation	3–4
• Identifies alternative uses of water – between agriculture and the environment eg irrigation versus river flow; irrigation of rice versus irrigation of other horticultural crops; bare fallows washes soil and fertiliser into rivers • No evaluation	1–2

Question 8 (a)

Outcomes assessed: H2.2

MARKING GUIDELINES

Criteria	Marks
• Describes the various stages of growth and development of an animal • Describes the link between time and growth and development and the changes in bone, muscle and fat	5
• Describes the various stages of growth and development of an animal	3–4
• Identifies the various stages of growth and development	1–2

Question 8 (b)

Outcomes assessed: H2.2, H3.1

MARKING GUIDELINES

Criteria	Marks
• Describes a nutritional strategy and links it to a product specification and fully evaluates this strategy in all three areas	9–10
• Describes a nutritional strategy and links it to a product specification and evaluates this strategy in detail in relation to two areas	7–8
• Describes a nutritional strategy and links it to a product specification and applies some superficial evaluation to this strategy in one or more areas	5–6
• Describes a nutritional strategy and links it to a product specification • Little or no evaluation	3–4
• Outlines a nutritional strategy and/or a statement of product specification • No evaluation	1–2

Question 9 (a)

Outcomes assessed: H2.1

MARKING GUIDELINES

Criteria	Marks
• Describes both problem and breeding system • Shows relationship between problem and breeding system	5
• Describes the breeding system and describes the problem	3–4
• Identifies a breeding system and/or identifies a problem in a plant production system	1–2

Question 9 (b)

Outcomes assessed: H2.1, H 5.1

MARKING GUIDELINES

Criteria	Marks
• Identifies three characteristics that have been bred into new plants • Evaluation of their impact across all three areas • Evaluation is made against criteria with valid judgements made • Judgements involve qualitative and quantitative assessment and examples may be provided	9–10
• Describes three characteristics that have been bred into new plants • Evaluation of their impact across at least two areas and at least one is done in some detail	7–8
• Describes three characteristics that have been bred into new plants • Some superficial (qualitative) evaluation of their impact on one or two of the areas	5–6
• Describes two characteristics that have been bred into new plants • Little or no evaluation of their impact	3–4
• Identifies up to three characteristics that have been bred into new plants • No evaluation of their impact	1–2

Agriculture Paper 2

2003 HSC Examination Mapping Grid

Question	Marks	Content	Syllabus outcomes
1 (a)	3	Financial technologies	H3.4
1 (b)	4	Obtaining farm finance	H3.4
1 (c)	8	A research study	H4.1
2 (a)	3	Animal breeding technique	H3.4
2 (b)	4	Object measurement in breeding	H3.4
2 (c)	8	A research study	H4.1
3 (a)	3	Plant characterisation in horticulture	H3.4
3 (b)	4	Manipulating plant process	H3.4
3 (c)	8	A research study	H4.1
4 (a)	3	Managing in alternative enterprises	H3.4
4 (b)	4	Marketing in alternative enterprises	H3.4
4 (c)	8	A research study	H4.1
5 (a)	3	Plant density	H3.4
5 (b)	4	Environmental and photosynthesis	H3.4
5 (c)	8	A research study	H4.1
6 (a)	3	Farming practices and soil degradation	H3.4
6 (b)	4	Soil processes and soil degradation	H3.4
6 (c)	8	A research study	H4.1

BOARD OF STUDIES
NEW SOUTH WALES

2003 HSC Agriculture
Marking Guidelines
Paper 2

Question 1 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines the characteristics and features of the financial technique and link its use to the consideration of changing/expanding on an enterprise	3
• Outlines the characteristics and features of the financial technique	2
• Identifies a financial technique	1

Question 1 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Relates the use of the strategies outlined to putting a plan together to obtain finance for enterprise change	4
• Outlines at least two strategies which may be used to obtain finance OR • Describes one strategy in detail	3
• Outlines a strategy which maybe used to obtain finance	2
• Identifies a strategy for obtaining finance	1

Question 1 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Outlines some components of the research study	1–2

Question 2 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines the characteristics and features of one breeding technique • Link the breeding technique to managing a reproductive outcome	3
• Outlines the characteristics and features of one breeding technique	2
• Identifies breeding technique	1

Question 2 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Relates the use of objective measurement data to the way in which a breeding program is carried out	4
• Describes the way in which data on objective measurement is collected for use in a breeding program or describes how objective measurement is used in the breeding program OR • Describes how objective measurement is used in the breeding program	3
• Outlines quality characteristics of the objective measurement	2
• Identifies an objective measurement used in a breeding program	1

Question 2 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Lists some components of the research study	1–2

Question 3 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines how the characteristics of an individual plant can be important in horticulture and links this to its use in the horticultural industry	3
• Outlines how the characteristics of an individual plant can be important in horticulture	2
• Identifies a useful characteristic of plant used in horticulture	1

Question 3 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines a physiological process involved in plant productivity and describes the way in which the process can be manipulated • Relates the manipulation of the process to productivity in the system	4
• Outlines a physiological process involved in plant productivity and describes the way in which the process can be manipulated	3
• Outlines a physiological process involved in productivity in plants	2
• Identifies a physiological process involved in productivity in plants	1

Question 3 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Lists some components of the research study	1–2

Question 4 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines the characteristics of the plant or animal and links this feature to the management of the alternative enterprise	3
• Outlines the characteristics of one feature of the biology of a plant or animal	2
• Identifies a feature of the plant or animal	1

Question 4 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes the link between knowledge of a potential market and the use of a particular marketing technique and relates this to the nature of alternative enterprises or particular production methods	4
• Describes the link between knowledge of a potential market and the use of a particular marketing technique	3
• Outlines knowledge of a potential market or a marketing technique	2
• Identifies some knowledge of a potential market or a marketing technique	1

Question 4 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Lists some components of the research study	1–2

Question 5 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes the way in which vegetative and reproductive yields change in response to density	3
• Describes the way in which vegetative or reproductive yields change in response to density	2
• Identifies the effect of planting density on vegetative yield OR reproductive yield	1

Question 5 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Relates the effect of TWO environmental factors to the photosynthetic process, demonstrating the impact of each environmental factor on the specific sub process within the photosynthetic process	4
• Describes the effects of TWO environmental factors that limit photosynthesis	3
• Outlines TWO environmental factors that limit the process of photosynthesis OR • Describes the effect of ONE environmental factor that limits photosynthesis	2
• Identifies TWO environmental factors that limit the process of photosynthesis or outlines ONE factor	1

Question 5 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Lists some components of the research study	1–2

Question 6 (a)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Outlines the characteristics and features of some related practices that have led to the degradation and links the way in which each of the practices lead to this degradation	3
• Outlines the characteristics and features of some related practices that have led to the degradation	2
• Identifies at least one relevant farming practice	1

Question 6 (b)

Outcomes assessed: H3.4

MARKING GUIDELINES

Criteria	Marks
• Describes the way in which the physical or biological processes (ie more than one) have caused the identified soil degradation • Relates the soil processes to the condition of the degraded soil • Relates the changes in the soil environment due to the degradation to the way in which plant growth is impeded	4
• Describes the physical or biological processes (ie more than one) which have caused the identified soil degradation and outlines its effect on plant growth (ie the features of plant growth that are affected)	3
• Outlines ONE physical or biological process which has led to an identified degradation problem	2
• Identifies ONE soil process that is involved in soil degradation	1

Question 6 (c)

Outcomes assessed: H4.1

MARKING GUIDELINES

Criteria	Marks
• Identifies a research study • Describes most components of the research study • Makes valid and substantiated judgements about the – research design – data analysis and presentation – conclusion and recommendation using the aim of the research study as a criteria	7–8
• Identifies a research study • Describes most components of the research study • Makes judgements about the – research design – data analysis and presentation – conclusion and recommendation, used in the study	5–6
• Identifies a research study • Describes some components of the research study • Makes some limited judgements about the research study	3–4
• Identifies a research study • Lists some components of the research study	1–2