2014 Examination Report

VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

State Government Victoria

2014 Agricultural and Horticultural Studies: GA 3: Examination

GENERAL COMMENTS

In the 2014 Agricultural and Horticultural Studies exam, modifying soil-growing media and climate to maximise production was generally not well understood by many students. Understanding of how hard-coated seeds could be treated pre-sowing and problems associated with organic matter in soils and potting mixes was particularly limited. It is important that teachers cover aspects of climate and soil modification that relate to a wide range of horticultural and agricultural contexts.

Students are required to study a number of weeds, which are listed by the VCAA. Responses to questions about weeds on this examination were simplistic and very general in content. It should be stressed to students that a detailed knowledge of their selected weeds is required. Apart from prevention and control measures, students need to show understanding of how the weed affects production of animals and plants. Understanding of the different risk classifications of weeds is an area that needs further revision.

In Question 9, students were able to state the signs and symptoms of their pest or disease quite well. However, strategies to either prevent or treat their selected pest or disease were generally limited in responses. Students who scored well for this question gave detailed responses.

Student understanding of what is meant by a new and emerging technology generally good. Explanation of how the new or emerging technology works or is used was generally basic in content. Students need to be able to show that they understand how the new or innovative technology works in detail. Students need to read questions carefully, as many students did not mention the current practice and how this compared to the chosen new technology. Students were able to state advantages and disadvantages of the technology quite well.

Students were generally able to state the likely impact of climate change on their chosen business and a potential adaptation strategy. Once again, many answers were simplistic in content. Detailed explanations gained many more marks.

Students are required to design and operate a small agricultural or horticultural business for 30 weeks throughout the year. Although Question 12 in this examination related to a commercial business, the principles are no different. Students need to understand that the principles of their business can relate to a commercial business, and ensure that they can identify the similarities of both. Students need to understand how the inputs and processes are monitored to maintain quality. They also need to know how various factors, such as the physical environment, marketing and government regulations, determine the type and size of the business. Student responses for all parts of this question were generally poor.

Understanding the difference between a managed and a natural ecosystem is an important component of the study. It underpins the understanding of practices that prevent or rectify land degradation. Many students showed little understanding of these concepts. Identification of an issue and the key indicator was generally well answered. Explanations as to how to overcome the issue and its prevention, as well as how the degradation affects economic, environmental and social sustainability, generally showed little understanding.

Questions 14a. and 14b. were about the development of property management plans (often called whole farm plans) and were poorly answered. Many students did not know the purpose of the plan or the steps required to develop a plan. More time should be spent focusing on this area.

When preparing for the examination, students should refer to the current *VCE Agricultural and Horticultural Studies Study Design* and the examination specifications and sample questions for Agricultural and Horticultural Studies. Students need to be able to apply their understanding to a range of land, plant and animal management techniques in agricultural and horticultural businesses throughout Victoria.

This report should be read in conjunction with the 2014 VCE Agricultural and Horticultural Studies written examination.

SPECIFIC INFORMATION

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

Question 1a.

Marks	0	1	Average
%	23	77	**0.8**

Students needed to identify one technique for modifying farm topography. Possible responses included (one of):

- raised beds
- levelling
- terracing
- contour ploughing
- contour banks
- channel filling.

Question 1b.

Marks	0	1	2	Average
%	67	22	11	**0.5**

Students needed to describe two pre-sowing treatments that can be used to aid the germination of hard-coated seeds. Possible responses included (two of):

- boiling
- abrasive sanding/nick (scarification)
- soak in water or acid solution
- exposure to heat and smoke
- burning
- soak in soapy water
- passing through appropriate animals
- microwaving
- placing seeds in hot water.

Question 2

Marks	0	1	2	3	4	Average
%	13	42	37	8	1	**1.4**

Students were required to state two advantages and two disadvantages of using a drip irrigation system instead of an overhead sprinkler system to water trees in an orchard.

Advantages (any two of):

- delivers water to a specific site
- effectively manages water delivery
- can be cheap to set up
- less leaf disease
- less fruit spoiling
- more efficient irrigation and less water use; therefore, cheaper running costs
- less drift on windy days
- potential for fertigation
- less fungal disease due to lower humidity
- lower humidity
- less evaporation
- saves water.

Disadvantages (any two of):

- more maintenance
- drippers can become blocked
- cannot reduce frost damage

- cannot reduce high temperatures
- cannot put fires out
- localised salinity near dripper
- reduced root exploration of trees
- harder to observe if functioning properly
- unable to alter humidity effectively
- unable to cool whole plant down.

Question 3a.

Marks	0	1	2	Average
%	20	38	42	**1.2**

Organic matter in soil or potting mix is generally good for plants. Benefits of having organic matter in soil or potting mix are:

- increases water-holding capacity
- improves soil structure
- improves nutrient retention
- provides some nutrients when breaking down
- increases positive soil organisms
- helps to naturally fertilise the plant
- increases soil biodiversity.

Question 3b.

Marks	0	1	2	Average
%	50	43	7	**0.6**

Problems that may be caused by organic matter in soil or potting mix include:

- introduces weeds/seeds
- introduces pathogens/toxins
- introduction of disease
- holds too much water/water-logging
- potential water repellence.

Question 4

Marks	0	1	2	3	Average
%	8	22	33	37	**2**

Students were required to outline three things, other than supplying food and water, that the manager can do so that the animals have the optimum environment for production in an intensively managed system.

Possible responses included (three of):

- light control
- adequate housing
- shading
- temperature control (including sprinklers and fans)
- disease control
- pest control
- adequate space
- calm environment
- provide salt licks to address deficiencies
- prevent animal–animal attack
- provide good quality air if housed
- prevent excessive dust
- clean, hygienic environment
- constantly observe livestock for pests and diseases
- shelter
- vaccinate or drench.

Question 5

Marks	0	1	2	3	4	Average
%	4	19	32	34	11	**2.3**

This question was about the growing of a commercial crop of cherry tomatoes in a polyhouse and the advantages compared with growing them in the field. Possible responses included any four of the following examples.

- better control over:
  - the temperature
  - soil/growing-medium moisture levels
  - light levels
  - humidity
  - wind or air movement
  - some pests, vermin and some diseases
  - spray drift from chemical/water application
  - the working environment
  - the security of crop from theft
  - the protection from physical damage, such as storm, hail or sunburn damage
  - the ability to extend the growing season
  - the planting height (better ergonomics for workers)
- sterile growing medium
- can be grown on poor quality (cheap) farmland – does not need good soil
- supplies exactly what the plant needs – nothing extra
- grows more in a smaller area
- growing media is lighter and easier to set up
- weeds not an issue.

Question 6a.

Marks	0	1	2	Average
%	25	58	17	**1**

Students were asked to select a weed other than flickweed from the table given and discuss the effect that this weed may have on animals.

Many students failed to mention a specific example of an animal that the weed would have an effect on and many responses lacked detail. Information about effects on animals can be sourced from the Victorian Department of Environment, Land Water and Planning's website.

Question 6b.

Marks	0	1	2	Average
%	35	47	18	**0.9**

Students were required to discuss the effect that a weed other than capeweed may have on crops. Information for effects on crops can be sourced from the Victorian Department of Environment, Land Water and Planning's website.

Question 6c.

Marks	0	1	2	Average
%	49	31	20	**0.7**

This question required students to select a weed and discuss the effect that this weed may have on the quality of the final agricultural or horticultural product, **not** a stage of development. The effect of these weeds could be discussed as a decrease in value of fleece, carcass or yield caused by competition, or decrease in standard of the final product due to contamination. Other high-scoring answers would have mentioned injuries to livestock such as cuts or irritation. Slower growth rate so that selling opportunities are lost (for example, lambs' cut teeth or weaners not able to be sold) was also a good response.

Many responses were simplistic in content. Students should be encouraged to give detailed responses that demonstrate their understanding.

Question 7ai.

Marks	0	1	Average
%	14	86	**0.9**

A weed refers to a plant that is unwanted in a particular place and time.

Question 7aii.

Marks	0	1	Average
%	76	24	**0.3**

Students were asked to explain what the term 'regionally controlled' means.

- Regionally controlled weeds occur in particular regions, are capable of spreading further and should be prevented from doing so. Continuing control measures are required to prevent their spread.
- It is the landowner's responsibility to take all reasonable steps to prevent the growth and spread of regionally controlled weeds.
- If the landowner fails in their obligations regarding regionally controlled weeds, they may be served with a Directions Notice or Land Management Notice (LMN). The Directions Notice or LMN will direct the landowner to take certain actions to control weeds on their property. If they fail to comply with the Directions Notice or LMN they may be liable for a penalty under the *Catchment and Land Protection (CALP) Act 1994*.

This question was not answered well. Many student responses simply reworded the question as their answer.

Question 7b.

Marks	0	1	2	3	4	Average
%	22	31	24	14	9	**1.6**

Students were required to state four techniques of an integrated weed management plan, to control and eradicate weeds, that would be compatible with organic farming.

As the garden is organic, **no** mention of spraying should have occurred. Appropriate techniques could have included any four of the following:

- physically remove plants
- slash or cut plants prior to flowering and seeding to reduce seedbed
- if late and seeds are set, carefully remove plants and place in plastic bags for removal (do not compost in case of carry-over seeds)
- plant crops that compete well
- biological control
- burn to destroy seeds
- use weed mat
- solarisation (or cover with black plastic).

Question 8a.

Marks	0	1	Average
%	35	65	**0.7**

A possible answer could have been: This sign forms part of a biosecurity plan for the primary producer.

Students needed to explain the purpose of the sign that would be placed at the entry of a primary producer's property. The words 'biosecurity' and 'plan' needed to be included in the response.

Question 8b.

Marks	0	1	2	3	Average
%	9	36	46	9	**1.6**

Students needed to outline the measures the primary producer who owns the land should ask visitors and contactors to take before entering the property, to ensure that no foreign weed species are introduced to the property.

The primary producer/landowner should:

- inspect machinery prior to it entering the property
- ask what areas the contractor had been in before or speak to other farmers where the contractor has been previously to discuss weeds on their property

- demand the contractor's equipment be blown down with high-pressure air away from the property
- demand washing of contractor's equipment occurs away from property
- the contractor wears clean clothing to remove seeds of weeds
- clean accompanying vehicles to remove weed seeds
- clean footwear is worn by contractor to ensure no seeds are caught in treads
- ask for a guarantee from the contractor that no new weed species will be introduced.

Question 9a.

Marks	0	1	2	Average
%	18	47	35	**1.2**

Students were required to select one pest or disease from the table provided. No marks were awarded for listing the pest or disease.

Students were required to describe the symptoms or signs that indicate this pest or disease is present on a property.

Question 9b.

Marks	0	1	2	Average
%	13	58	28	**1.2**

Students had to state two impacts their chosen pest or disease may have on an agricultural or horticultural business.

Question 9c.

Marks	0	1	2	3	4	Average
%	21	32	20	19	8	**1.6**

Students were required to state one prevention and one treatment method for their chosen pest or disease.

Students generally showed some understanding of their pest or disease. In many of the responses, specific detail was generally lacking. For more details on pests and diseases, refer to the Victorian Department of Environment, Land Water and Planning's website.

Question 10ai.

Marks	0	1	2	Average
%	20	47	33	**1.2**

Students were required to describe one new or emerging technology or innovation important for the development of agricultural and horticultural industries.

Most students could give some detail of their chosen technology or innovation in terms of how it works or is used. Good answers were detailed and did not discuss in generalities.

Some students gave examples of technologies or innovations that are not new or emerging or were incorporated widely within the agriculture or horticulture fields. The study design states that students are to focus on new or emerging technology or innovations that have been adopted by only a small number of agricultural and/or horticultural businesses. New technology or innovation is defined as having been readily available for fewer than five years preceding the year of study; emerging technology or innovation is still in the development stages and is not commercially available. Some of the types of technologies that were **unacceptable** are listed in the table below.

algae ponds	methane digester
artificial insemination (cervical/laparoscopic)	Nite Guard predator deterrent
automatic calf/cow feeders	NLIS ear tags
automatic hay ring tipper	OPTILINE drencher
automatic slaughtering machines	petrol post driver
auto-steer tractor	refrigerated trucks
barley fish food	raised beds
BioClip	robotic dairies
bio-control agents	Roundup Ready canola
CCTV	salt-tolerant wheat
drench capsules	sniffer bees
dung beetles for worm control	solar gates
Elders weather app/CliMate	solar panels
embryo transfer	solar-powered canola dryer
sexed semen	soybean oil tyres
feed reducing methane emissions	Swath Control – variable spraying (John Deere)
FodderTech sprout fodder	telematics
GM foods	tick-resistant cattle
GM	vaccination (CD-T toxoid)
GPS tractors	vertical gardens
grape marc feed	wide-span tractors
laser levelling	wind turbines
LED lighting	

It should be noted that robotic dairies are no longer considered new or emerging.

Question 10aii.

Marks	0	1	2	3	Average
%	23	31	28	17	**1.4**

Students were asked to assess the likely impact of the technology or innovation by comparing its advantages and disadvantages over current practice.

Question 10bi.

Marks	0	1	2	Average
%	32	38	30	**1**

Students were required to describe a second new or emerging technology or innovation important for the development of agricultural and horticultural industries.

They were again asked to describe how this technology or innovation works or is used.

Question 10bii.

Marks	0	1	2	3	Average
%	29	27	33	10	**1.3**

Students were asked to assess the likely impact of the technology by comparing its advantages and disadvantages over current practice.

For both Questions 10aii. and 10bii., most students could state some advantages and disadvantages of the new technology or innovation, but many students failed to mention current practice in their response.

Question 11a.

Marks	0	1	2	3	Average
%	18	44	33	5	**1.3**

Students were asked to choose one type of business and one climate change issue. They were asked to state the likely impact that their chosen climate change issue would have on their chosen type of business.

Question 11b.

Marks	0	1	2	3	Average
%	19	43	29	9	**1.3**

This question required students to outline a possible adaptation strategy that their chosen business could adopt to cope with the climate change issue.

Possible responses for Questions 11a. and 11b. are listed in the table below.

Climate change issue	Potential impact on the business	Possible adaptation strategy
Dryland cropping		
increase in mean temperature, reduced chilling	earlier maturation; reduced grain quality; heat stress on plants, particularly at flowering – susceptibility dependent on crop; increased water use, possible water stress; increased potential for fire; operator heat stress; changed range of potentially suitable crops; reduced frost damage	change in variety or growing season; change in crop; water retention practices such as mulching and use of weed mats; weed control
decrease in average annual rainfall	water stress on plants, reduced yield; potentially non-viable cropping	water-retention practices; change in variety/crop; agronomic changes: sowing date, spacings
shift in rainfall pattern	changed range of potentially suitable crops; change in pest and disease issues; potentially increased erosion and salinity	water-retention practices; change in variety/crop; agronomic changes: sowing date, spacings; erosion control
increased frequency of very hot days	increased potential for fire; operator heat stress; heat stress on plants, particularly at flowering – susceptibility dependant on crop; changed range of potentially suitable crops; increased fire probability	change in variety/crop; agronomic changes: sowing date, spacings; crop insurance; air-conditioned cab
Dairying		
increase in mean temperature, reduced chilling	increased water demand; possible water stress; possible heat stress to plants, workers and animals; potential lasting damage to perennial pastures (haying off); reduced frost damage; change to milk storage requirements; changes in pasture composition; increased winter productivity	change pasture variety and adjust agronomy accordingly; water-retention practices, including improved irrigation efficiency; improve shelter for stock; improve electricity use efficiency; animal genetics

decrease in average annual rainfall	reduced pasture performance; increased demand for irrigation water; increased frequency of irrigation resulting in more work	water-retention practices; change in variety/crop; agronomic changes; buy more water rights; reduce herd size; organise feed arrangements
shift in rainfall pattern	change in timing of water requirements (if irrigated); shift in plant species	water-retention practices; change in variety/crop; agronomic changes: sowing date, spacings; erosion control
increased frequency of very hot days	increased potential for fire; operator heat stress; animal heat stress; heat stress on plants, particularly at flowering – susceptibility dependant on crop; changed range of potentially suitable species; blackouts; increased fire probability	change in variety/crop; agronomic changes: sowing date, spacings; crop insurance; stock shelter; backup power evaluation; animal genetics
Irrigated fruit trees		
increase in mean temperature, reduced chilling	potentially reduced fruit set; earlier maturation; heat stress on plants, particularly at flowering – susceptibility dependent on crop; increased water use, possible water stress and increased irrigation needs; increased potential for fire; operator heat stress; changed range of potentially suitable crops; reduced frost damage	change tree/rootstock variety and adjust agronomy accordingly; water-retention practices, including improved irrigation efficiency; shadecloth; clay spray to increase reflection; breeding program to reduce need for chilling
decrease in average annual rainfall	water stress on plants, reduced yield; potentially non-viable cropping; increased irrigation requirement	water-retention practices; change in variety/crop; agronomic changes; buy more water rights; reduce orchard
shift in rainfall pattern	changed range of potentially suitable crops; change in pest and disease issues; potentially increased erosion and salinity; changed timing of irrigation water requirement; potential water-logging	water-retention practices; change in variety/crop; agronomic changes: spacings; erosion control; improved irrigation efficiency; pest and disease reevaluation
increased frequency of very hot days	heat stress on plants; damage to fruit; fire probability increase	change in variety/crop; misting devices; shadecloth; insurance
Urban wholesale nursery		
increase in mean temperature, reduced chilling	heat stress on plants, particularly at flowering – susceptibility dependent on crop; increased water use, possible water stress and increased irrigation needs; increased potential for fire; operator heat stress; changed range of potentially suitable crops; reduced frost damage; faster growth for some plants; change in consumer preference	change tree/rootstock variety and adjust agronomy accordingly; guide changes in consumer preference; water-retention practices, including improved irrigation efficiency; shadecloth; clay spray to increase reflection; breeding program to reduce need for chilling
decrease in average annual rainfall	water stress on plants, reduced yield; potentially non-viable cropping; increased irrigation requirement; reduced drainage needs	water-retention practices; change in variety/crops; agronomic changes; buy more water rights; reduce area; guide changes in consumer preference
shift in rainfall pattern	changed range of potentially suitable crops; change in pest and disease issues; potentially increased erosion and salinity; changed timing of irrigation water requirement; potential water-logging	water-retention practices; change in variety/crop; agronomic changes: spacings; erosion control; improved irrigation efficiency; pest and disease reevaluation; guide changes in consumer preference
increased frequency of very hot days	heat stress on plants; damage to fruit; seedling damage; increased fire probability	change in variety/crop; misting devices; shadecloth; insurance

Question 12a.

Marks	0	1	2	3	4	Average
%	20	33	28	15	4	**1.5**

Students were required to choose a specific agricultural or horticultural business. Using specific examples, students were asked to outline how inputs and processes could be monitored and managed to ensure that a product or service meets the quality that the market expects.

Many students were able to list some examples of inputs and processes for their chosen business, but few were able to explain how they were monitored to meet specific quality standards.

Question 12b.

Marks	0	1	2	3	4	5	6	Average
%	18	26	26	18	11	3	0	**1.9**

Students were asked to explain what factors they would need to consider for their chosen type of business when developing a business plan and deciding on or evaluating a location. The three areas that needed to be addressed were physical environment, marketing and government policies and regulations. Examples of factors to be considered are listed under these areas, below.

Physical environment:

- waterways
- native vegetation
- land suitability
- climate
- soil
- water availability
- slope

Marketing:

- transport
- footprint (distance to market)
- perishability of product
- bulk or volume of product
- cost of transport
- transport infrastructure

Government policies and regulations:

- *Catchment and Land Protection Act*
- state regulations
- local regulations
- EPA regulations (e.g not polluting waterways)

Question 12c.

Marks	0	1	2	3	4	Average
%	33	33	27	5	1	**1.1**

Students were required to describe two methods used to analyse the financial performance of the business to keep it economically sustainable.

Acceptable answers included (any two of):

- profit/loss statements
- financial records
- business plans
- monitoring marketing strategy
- production costs
- actual cash flows and returns.

Question 13a.

Marks	0	1	2	3	4	Average
%	50	19	16	12	3	**1**

Students were required to discuss the differences between the natural ecosystem and the managed ecosystem for their selected scenario in terms of biodiversity, biomass and the cycling of matter.

A good response should have included some points from the table below.

Managed ecosystem	Unmanaged ecosystem
monoculture in paddocks, i.e. controlled environment, small number of different flora and fauna	large number of different species present, both flora and fauna
lower biomass due to reduced number of species	high biomass due to large number species present
artificial control methods, i.e. spray pesticides and herbicides; cultivation	natural control measures, such as predators; boom and bust cycle

This question was poorly answered, with many students showing no understanding of the difference between managed and natural ecosystems.

Question 13b.

Marks	0	1	2	3	4	5	6	7	8	Average
%	9	9	18	12	15	10	10	10	5	**3.7**

Students were required to complete a table by identifying two sustainability issues for their selected scenario. One environmental indicator was required for each associated issue, and two methods were required to overcome the issue.

Example answers are listed in the table below.

Issue	Indicator	Method of overcoming the issue
algal bloom	algae in waterways	• decrease nitrogenous fertiliser application • have buffer zones between pasture and waterway so that decreased levels of nitrogen-based fertilisers reach the waterway • fence off waterway and have trough watering points for cattle so that decreased amounts of animal waste reach the waterway • split nitrogen applications • use legumes in rotation instead of using fertiliser • use variable rate technology to deliver nitrogen to areas that need it most • ensure that waste from dairy goes to settling ponds not waterways
water-logging or compaction	• water pooling • wheel marks • slow growth rate	• prevent stock and machinery from travelling across these areas when they are wet • deep rip to open up the soil • apply gypsum to improve drainage • plant deep-rooted crops in cropping area (e.g. canola) and deep-rooted forage plants in grazing paddocks (e.g. lucerne) • increase organic matter to increase soil porosity and increase drainage
salinity	• tree dieback • crystals on surface • poor pasture growth	• plant salt-tolerant plants in these areas, such as wheat grass and salt bush • deep rip to improve drainage

		• pump salty water to the surface and allow to evaporate (could sell salt) • laser level paddocks to decrease recharge water entering in low-lying areas • plant trees in higher areas to decrease the level of the water table
wind erosion or erosion	• sand on fence line • decreased visibility on windy days	• decrease speed of wind at soil surface • retain stubble • decrease stock numbers • add wind breaks • adopt minimum tillage or direct-drilling techniques • control rabbit numbers as they can eat foliage, and warrens, diggings, etc. loosen soil • if erosion has started, rip the soil up so that furrows and large clods decrease and trap loose particles

Question 13ci.

Marks	0	1	Average
%	56	44	**0.5**

Students were required to state a method that would prevent one of the issues mentioned in Question 13b. from occurring in other areas of the farm.

Most students were unable to state one prevention method.

Question 13cii.

Marks	0	1	2	3	Average
%	58	22	16	5	**0.7**

Students had to explain how the prevention method could bring about the desired effect.

Examples of responses are included in the table below.

Issue	Prevention method
algal blooms	• decrease nitrogenous fertiliser application • have buffer zones between pasture and waterway so that decreased levels of nitrogen-based fertiliser reach the waterway • fence off waterway and have trough watering points for cattle so that decreased amounts of animal waste reach the waterway • split nitrogen applications, so less excess will be leached into waterway • use legumes in rotation instead of using fertiliser; nitrogen is fixed in soil, not applied and released due to mineralisation and plant residue breakdown • use variable rate technology to deliver nitrogen to areas that need it most, thereby decreasing amount leached into waterway • ensure that waste from dairy goes to settling ponds not waterways
compaction, water-logging	• do not allow machinery to pass over these areas when wet to prevent compaction, fence off areas to prevent stock from entering • deep rip to open the soil and apply gypsum to improve soil aggregate size, allowing better drainage • plant deep-rooted crops such as canola or lucerne to open soil up and improve drainage • increase organic matter in soil to increase soil porosity • reduce stock numbers or do not put stock in that paddock
salinity	• plant salt-tolerant plants, such as wheat grass or salt bush, to lower water table

	• deep rip the soil so that drainage is improved and salt-affected water can be leached from upper levels of soil as the water table falls, use of gypsum can improve drainage • pump salty water to surface to decrease water table height • laser level to improve run-off and prevent water from pooling in low-lying areas • plant trees in higher areas (recharge) to decrease the level of the water table
wind erosion or erosion	• use methods that decrease the speed of the wind at the soil's surface • retain stubble • decrease stock or remove them altogether to prevent them breaking down soil structure • add wind breaks • adopt minimum tillage or direct-drilling techniques, which decrease soil disturbance; use narrow points or discs • control rabbit numbers, as burrowing loosens soil

Question 13d.

Marks	0	1	2	3	4	5	6	Average
%	42	20	16	13	5	3	1	**1.3**

Students had to choose one issue identified in Question 13b. and discuss how each form of sustainability (i.e. social, environmental and economic) is affected by the chosen issue.

Social sustainability:

- decreasing employment opportunities
- affecting family life
- farm may be sold and families move away
- increased reliance on benefits
- decreased numbers in towns affect sporting teams, clubs, schools, etc.
- increase incidences of stress, depression, etc.
- relationships with neighbours may be affected

Environmental sustainability:

- decreased carrying capacity of land
- loss of biodiversity
- decreased water quality

Economic sustainability:

- decreased income due to lower carcass values
- decreased income due to lower quality product (e.g. milk)
- decreased profitability
- lower land values for resale or borrowing
- less yield

Question 14a.

Marks	0	1	Average
%	76	24	**0.3**

Students were asked to state why property management plans are a recommended business practice. The response should have included the following points.

Property management plans allow the landowner to recognise and highlight areas of concern on their property and design a series of steps to improve the viability of the property, and hence increase social, environmental and financial sustainability of the property.

Question 14b.

Marks	0	1	2	3	4	5	Average
%	46	21	15	7	9	1	**1.2**

Students were asked to outline the main steps involved in producing a property management plan.
Responses should have mentioned the following steps.

- Create a vision statement or goal.
- Take an aerial view of property and put it on a board.
- On acetate sheet 1 include information such as buildings, fence lines, tracks, land classes, slope, etc.
- On acetate sheet 2 include problem areas such as weeds, salinity, erosion, water-logging, etc.
- On acetate sheet 3 include the ideal farm layout.
- Create a timeline of tasks to be completed and budget.
- Access the plan on a yearly basis and revise vision statement and goals.