



INTERNATIONAL SECONDARY CERTIFICATE EXAMINATION
NOVEMBER 2024

AGRICULTURAL MANAGEMENT PRACTICES

MARKING GUIDELINES

Time: 3 hours

200 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

SECTION A

QUESTION 1

- 1.1 1.1.1 D
1.1.2 A
1.1.3 D
1.1.4 A
1.1.5 A
1.1.6 B
1.1.7 A
1.1.8 B
1.1.9 C
1.1.10 D

1.2	1.2.1	1.2.2	1.2.3	1.2.4	1.2.5	1.2.6	1.2.7	1.2.8	1.2.9	1.2.10
	F	H	D	B	A	C	J	E	M	L

- 1.3 1.3.1 Marketing/Advertising
1.3.2 Inventory
1.3.3 Loan
1.3.4 Marketing matrix
1.3.5 Processing
1.3.6 Grading
1.3.7 Collateral
1.3.8 Crop rotation
1.3.9 A commercial farmer
1.3.10 Vaccination

- 1.4 1.4.1 Topography
1.4.2 Land/Soil
1.4.3 Extensive
1.4.4 Over capitalisation
1.4.5 Coordination
1.4.6 Entrepreneur
1.4.7 Threats
1.4.8 Sourveld
1.4.9 Under capitalisation
1.4.10 Income Statement

SECTION B

QUESTION 2

- 2.1 Explain in detail the use of technology to optimise production and support your answer with information from the article**

This is a production system that uses technology; various elements such as the sensors, servers, LED artificial light and smart phones to collect and process information to enable better management of inputs to increase yields in this hydroponic system.

- 2.2 From the article, extract TWO advantages of precision farming as outlined in this hydroponic vegetable growing technology.**

(Any 2)

- More precise application of inputs; nutrients (fertiliser) premixed with water at predetermined scale.
- Less wastage as nutrient solution is recycled.
- Better management; setting watering time, lighting time and alert levels through a smart phone.
- Less laborious; farmers add water twice a week and replace seeds only after harvesting.
- Time saving (increased growth rate from 30–50%).
- Better returns/production (50–300% increase).

- 2.3 Identify the technological tools used in the article, to aid the following:**

- 2.3.1 Detect variations in temperature and humidity in the air.**

Sensor

- 2.3.2 Data storage and update.**

(Any 1)

- Server
- Smart phone

- 2.3.3 Illumination of plants.**

LED artificial lighting system

2.4 2.4.1 Briefly describe how this method of vegetable production helps farmers to better manage the natural resources outlined below.

(a) Plant nutrients

(Any 2)

- Soil nutrients are better utilised when pre-mixed with water, nutrients are pumped and recycled & plant uptake is improved.
- Nutrients are not lost down the soil profile through leaching.
- No soil degradation.

(b) Water

(Any 2)

- Water is recycled thus less loss of water out of the system takes place
- No water pollution as excess nutrients are recycled in the system.
- No eutrophication as excess nutrients are recycled in the system.

2.4.2 Identify the economic properties of soil that are apparent in each of the descriptions below.

(a) Soil does not naturally run out, does not decay, does not get old and does not get used up.

Soil is indestructible

(b) Soil will always have value.

Soil is durable

2.4.3 List FOUR factors that determine whether the land is arable or not.

(Any 4)

- Soil depth
- Rockiness
- Slope
- Texture
- Drainage

2.4.4 Suggest with justification ONE method that a farmer could use to overcome soil erosion on a sloping area.

(Any 1)

- *Contour ploughing/farming*
Because contour ploughing reduces the incidence of run-off water as we plough across the slope rather than along the slope; the practice of making contour walls across a hill so that the contour walls remain at the same height and do not go up or down the hill (slope)/ contours change the direction of run-off water from direct downhill to around the gradient of the hill.
- *Stable outlets*
Stable outlets for surface water on contoured field.
- *Vegetation strips*
Growing of crops between grass strips to protect the soil from direct removal by run-off water.
- *Contour banks/stone banks*
Stone bank is built along the contour to reduce water flow.
Making ditches with the bank of the soil on the down slope to stop the rainwater from carrying the soil away.
- *Terraces*
Making of steps into the slop and you grow crops on the flat part of the step and support the soil on the upright of the step with grass and trees, or with stones if the slope is stony.
- *Mulching*
Cover the soil to minimize the impact and flow of run-off water.
- *Good pasture/veld management*
Good plant coverage to reduce the flow of water.
- *Correct cultivation methods*
Create the soil surface that is resistant to erosion.

2.5 2.5.1 Define *labour*.

Labour is the physical and mental work performed by people. It includes manual labourers, supervising operators, accountants, etc.

2.5.2 Formulate a short explanation of the following as applied in the article:

(a) Permanent labourer

A labourer that is employed by the farmer for the whole year (full-time basis throughout the year), for example, daily livestock herding and feeding. Entitled to some benefits such as paid leave, housing and can live with their families within the farm.

(b) Casual labour

A labourer employed on short-term basis to carry out specific duties to carry out specific duties such as fencing and de-bushing. They do not have contracts, and labour laws do not apply.

2.5.3 In the article, identify THREE major challenges encountered by farm labourers in Namibia.

(Any 3)

- Poor living conditions (lack of accommodation).
- Work longer than the standard working hours.
- Do not receive their annual leave, if granted it is paid.
- They are not provided protective clothing (PPE).

2.5.4 Identify and explain ONE labour law violated by most Namibian farmers as outlined in the article.

(Any 1)

- Labour Act (1992): contains extensive and detailed provisions relating to basic conditions of employment, and rules concerning termination of service, dismissal of workers, and disciplinary action.
- Occupational Health and Safety Act: to ensure that the working environment is safe and holds no risk to the health of workers.

2.6 2.6.1 Formulate a short explanation of mechanisation as depicted in the picture.

When machinery is used to replace human labour / animal draft / power to carry out agricultural operations such as spraying as shown in the picture for improved efficiency and product quality.

2.6.2 Compare the use of manual labour and mechanisation in terms of the following:

(a) Costs

Manual labour is cheaper, while mechanization is more expensive.

(b) Efficiency

Manual labour is less efficient, while mechanization is more efficient.

(c) Product quality

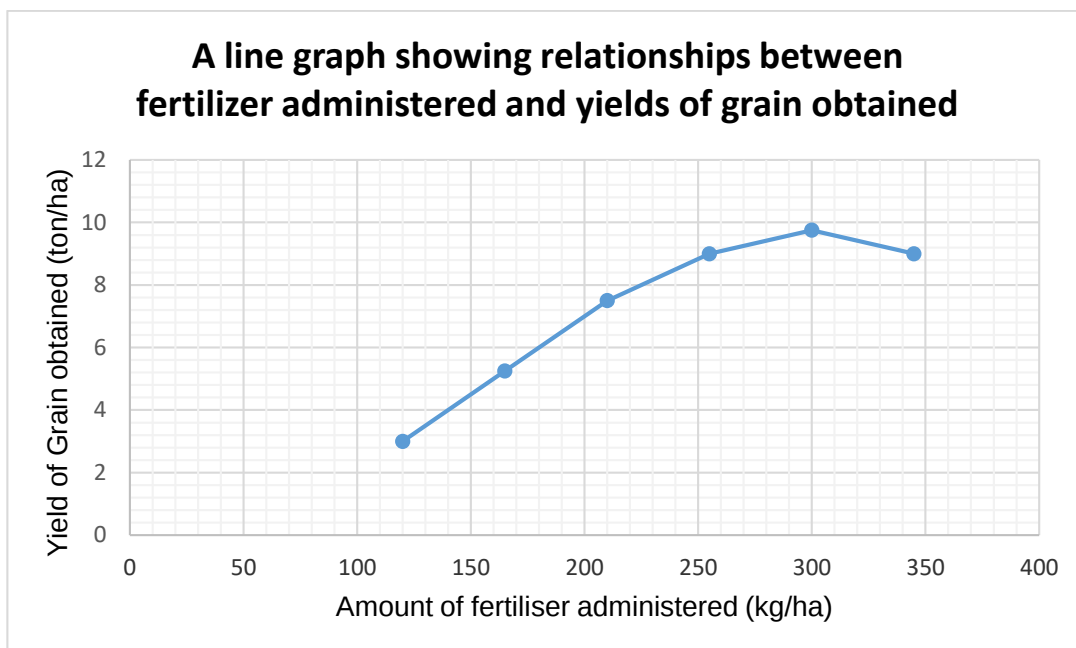
Depending on the product manual labour can secure a better-quality product, e.g., fruit & vegetables, where hand picking leads to less damage.

2.6.3 State TWO negative effects of high farm mechanisation.

(Any 2)

- Social justice: job losses / unemployment / no skilled labourers.
- Environmental justice: air pollution / land pollution / water pollution / noise pollution.
- Economic matters: expensive.

2.7 2.7.1 Line graph showing the relationship between fertiliser administered and grain yield obtained for the last six years.



Marking of graph	Yes	No
Heading	1	0
X-axis labelled with unit	1	0
Y-axis labelled with unit	1	0
Correct calibration	1	0
Line graph	1	0
Correct positioning online graph	1	0

2.7.2 State the economic term depicted by the line graph in Question 2.7.1.

The law of diminishing returns.

2.7.3 Describe the tendency in the table in Question 2.7 and state the conclusion that the producer will reach after he has studied the recorded data.

- From 2018 to 2020 the yields obtained increased with an increase in fertilizer application.
- From 2021 to 2023 an increase in fertilizer application did not lead to a marked increase in production, thus the excess fertilizer is lost/ can lead to soil pollution

2.7.4 Explanation of contribution to soil pollution.

- The data shows that too much fertiliser was administered as the fertiliser was increased with an aim of increasing yields, more importantly in the last 2 years.
- The excess fertiliser, therefore contributed to both soil and water pollution in form of soil solution and ground water.

QUESTION 3

- 3.1 3.1.1 **List THREE other areas of interest tourist can be treated with, other than ostrich riding from the article.**

(Any 3)

- Observe large flocks of ostriches at different stages of development.
- Feed ostrich by hand.
- Watch how feather dusters and boas are made.
- Visit the shop and purchase items on sale.

- 3.1.2 **Explain what is meant by the term *agritourism*.**

The form of commercial enterprise that links agricultural production with tourism to attract visitors onto the farm. The field of agriculture where producers try to diversify by attracting visitors into the farm to increase profits.

- 3.1.3 **Identify the following types of agritourism:**

- (a) **Tourists visiting the ostrich farm to conduct research on ostrich breeding.**

Educational tourists

- (b) **Tourist visiting the farm to follow the route to see how ostrich products are being processed.**

Product-route tourists

- 3.1.4 **Problems that could emanate from having a large number of tourists visiting the farm.**

(Any 3)

- May bring diseases to the farm (Biosecurity issues).
- Negatively impact the environment if not properly managed (pollution).
- May result to loss of privacy.
- May result in too much pressure on the resources/existing structure.
- It can turn out to be expensive/costly as time goes by; additional of trained staff, development requires additional planning, and supervision.
- There are Acts involved to regulate inclusion of tourism in agriculture – legal aspects and additional insurance are additional cost.
- Daily operations may create problems on social well-being, human health, empowerment and transport.

3.2 3.2.1 State the marketing channel used in this farm.

Directly to the consumer (direct marketing)

3.2.2 Suggest TWO reasons why this marketing channel may not be ideal in this farm.

(Any 2)

- Their products were unknown.
- Low clientele base/low response as only the people on the farm or has visited the farm know about the product.
- Needs his flexibility on the price of the product as tourist may be exploitive.
- Risk of theft is high.
- Additional staff may need to be appointed.
- Costs accumulate if stalls are built, rented or equipment purchased.

3.2.3 Evaluate the suitability of using a website as a method of advertising in this farm.

(Any 2)

- Increased clientele base (can reach global audience).
- It is very fast and can allow development of the brand within a short period of time.
- Cost effective/costs are relatively low (affordable).
- Does not require large investment/not capital intensive.

3.3 3.3.1 Explain the effect of this outbreak on the supply of eggs in South Africa.

(Any 2)

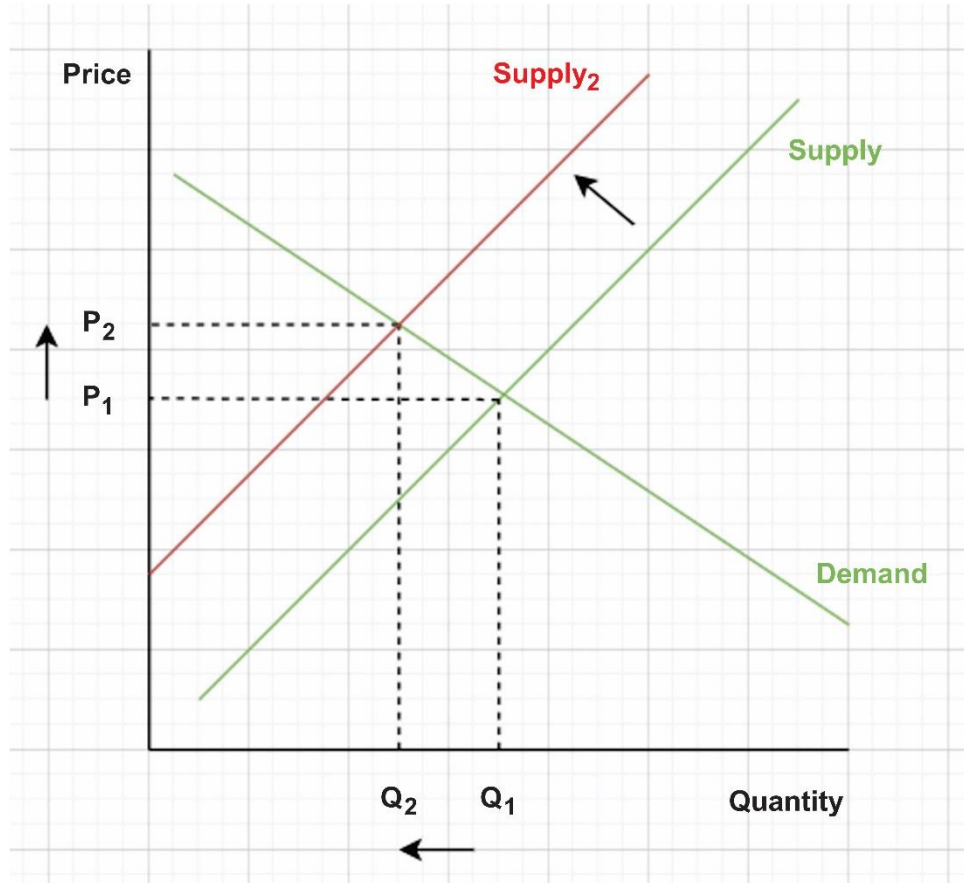
- Most farmers are exiting the industry, hence low supply of eggs.
- Dead/sick birds do not lay eggs, hence reduced supply of eggs.
- A substantial number of layers might be culled to prevent spread, hence reduced supply of eggs.

3.3.2 Discuss the impact of this outbreak on the supply and price of eggs in South Africa.

The outbreak will result to reduced supply of eggs, thus increased demand and higher the price.

3.3.3 Explain, using the supply and demand curve to support your answer, how the reduced supply of eggs has affected the price of eggs in South Africa.

Reduced egg supply causes price increase



3.3.4 The article mentions that a number of small producers have gone out of business as a result of the outbreak.

(a) TWO reasons why small producers are more vulnerable in this situation.

(Any 2)

- Scale of production is low and as such they could not benefit from economies of scale; fixed production costs are higher.
- Small producers are less flexible.
- Less saleable products to generate income when required.

- (b) **Suggest how small producers could protect their businesses and become more sustainable.**

(Any 2)

- Diversification to spread the risk.
- Have an alternative source of income.
- Focus on improving the efficiency.
- Insurance
- Small producers come together to form cooperative so they can a strong voice in the market.

- 3.3.5 **The article mentions the South African Poultry Association. Give the FOUR functions of industry associations in the agricultural industry.**

- Conduct research and come up with latest intervention to improve production.
- Address challenges faced by the industry.
- Train and empower the producers.
- Sell and bargain on behalf of the producers.

- 3.4 **If the selling price of eggs is R60 000 per ton, the fixed cost R96 000 per chicken shed and the variable cost R41 000 per chicken shed. Calculate the break-even point. Show the formula as well as all the calculations.**

$$\begin{aligned}\text{Break-even point} &= \frac{\text{Fixed cost}}{\text{Price} - \text{variable cost}} \\ &= \frac{96\,000}{60\,000 - 41\,000} \\ &= \frac{96\,000}{19\,000} \\ &= 5,1\end{aligned}$$

Therefore, more than 5,1 tons of eggs of eggs per chicken shed should be sold to make a profit.

- 3.5 **The outbreak of the Avian flu offered business opportunities to biosecurity supplies to entrepreneurs.**

- 3.5.1 **Briefly explain the term *entrepreneur*.**

Someone who is able to identify a business opportunity and has the courage to take the risk to establish and manage the enterprise.

3.5.2 Give TWO reasons why this farmer will have to compile a farm budget.

(Any 2)

- To determine the amount capital needed to start this business.
- To determine is practicability of the decision to start this business.
- To determine is this business will be profitable or not.
- To quantify long term strategy and objectives.
- For control purposes.

3.5.3 Name TWO basic elements of a budget.

- Estimated income.
- Estimated costs.

3.5.4 Distinguish between a whole-farm budget and an enterprise budget.

(1 advantage, 1 disadvantage)

Whole-farm budget	Enterprise budget
• Contains the expected income, expenses, and profit of a given farm plan. • Used to estimate the profitability of an entire farm.	• Contains the expected income and expenses related to a particular enterprise (both fixed and variable costs).

3.6 Interestingly, the few surviving small egg producers are planning to expand production in response of the increasing demand for eggs.

3.6.1 Name the tool the farmers could use to apply for a loan to obtain extra capital needed for this expansion.

Business plan

3.6.2 Give ONE institution where a farmer can acquire capital.

(Any 1)

- Commercial bank
- Land bank
- Non-banking financial institutions

3.6.3 Describe THREE important reasons of reviewing a business plan.

(Any 3)

- To provide for any changes in the market.
- To help the owner to make the best use of opportunities.
- To be prepared for possible events.
- To adopt the plan to any changes in the external environment.

QUESTION 4

4.1 4.1.1 **Identify the harvesting method in the article.**

Mechanical harvesting

4.1.2 **Name the harvesting implement used in the article.**

Combine harvester

4.1.3 **Give THREE ways in which the quality of wheat can deteriorate as a result of poor post-harvest handling and storage.**

(Any 3)

- Damage by insect pest
- Damage by rodents
- Spoilage by moisture/moulds
- Deterioration due to extreme heat
- Cracking/drying out due to extended storage

4.2 4.2.1 **TWO factors that determine the method of storing grain?**

- Moisture content of the product.
- Relative humidity of the environment during the time of storage.

4.2.2 **List FOUR advantages of storing products in bags.**

(Any 4)

- Easier to load and handle.
- Contain specific weight and amount.
- Grain can be graded and stored or transported according to their grade.
- Grain is not directly exposed to air.
- Infected bags can be treated separately.
- Bags can be easily tagged individually.

4.3 4.3.1 **Identify the management practice that can rectify these problems.**

Control

4.3.2 Suggest TWO practical mechanisms that will reduce the problem of labourers arriving late for work and leaving early in the afternoon.

(Any 2)

- Provide transport.
- Provide accommodation.
- Apply a disciplinary action.
- Implement a time clock system that will control the labourer's arrival and departure.
- Keep an attendance register.

4.3.3 A disciplinary action is needed to curb the theft of wheat. List FOUR requirements for efficient disciplinary action.

(Any 4)

- Action must be aimed at the offence and not the employee.
- Action must take place as soon as possible after the offence.
- Action must be consistent at all times.
- Keep relationship with employee as normal as possible – as if no offence has taken place.
- Employee must be aware of action against him/her if he/she commits a certain offence.

4.4 4.4.1 Formulate a short explanation of milk processing as applied in the picture.

Milk processing is the conversion (changing) milk which is a primary agricultural product into various more useful / edible / valuable products.

4.4.2 Give TWO reasons for processing milk into various products.

(Any 2)

- Prolong shelf life of milk.
- Address demand for various milk products.
- Utilize lower quality milk.
- Easier transport and handling.

4.4.3 Processing of agricultural produce can be divided into primary conversion and secondary conversion. Classify the milk products in the picture above under the correct headings.

PRIMARY CONVERSION	SECONDARY CONVERSION
Milk	Cream
	Yoghurt
	Cheese

4.4.4 Identify THREE methods of preserving milk used in the picture.

- Pasteurisation
- Freezing
- Fermentation

4.4.5 The cooling of milk during transportation and in the storeroom is of the utmost importance.

- (a) **Justify the statement above by referring to the effect of temperature on living microorganisms and enzymes present in the milk.**

(Any 2)

- Cooling slows down the life processes of microorganisms as well as microbial activity (enzymes) which cause spoilage of the product.
- Slows down multiplication (reproduction) of microbial population.
- Cooling should take place as quickly as possible after milking, storage and transportation.

- (b) **TWO types of cooling methods**

(Any 2)

- Cold-air cooling
- Hydro-cooling
- Ice-pack cooling

4.5 4.5.1 Explain the information that must be provided on the label by referring to the following aspect:

- (a) **Product information**

(Any 2)

- Name/type of product.
- Mass/volume of product.
- Ingredients of the product.
- Nutritional values.

- (b) **Nutritional value**

(Any 2)

- Table with nutritional value.
- Value as mass/percentage of RDA.
- Arranged from highest to lowest order.

(c) Allergies

- Any allergies that can be caused by the product must be indicated.
- Any allergies that is not related to the product itself or that is added.

4.5.2 For which TWO reasons are products mainly packaged?

(Any 2)

- Protection of the product from contamination, moist, light.
- Products are handled more easily.
- Product to be transported easily.
- Information about the product is communicated on the packaging material.
- Identification of the product.
- Value addition.

4.5.3 Evaluate the suitability of polyethylene as the packing material for fresh milk.

Suitable because it does not absorb odour, light weight, low cost, and can be cleaned.

4.5.4 Plastic is no longer a preferred packaging because of its negative effects on the environment. Explain why.

(Any 1)

- Plastic is non-biodegradable.
- Because it has a petroleum base that pollutes the environment for many years after it has been discarded.

4.5.5 Propose a solution for the problem of plastic pollution.

(Any 1)

- Use biodegradable products.
- Use recycled products.

4.6 4.6.1 From the article, explain the definition of a *niche market*.

A niche market is the supply/marketing of a unique product/service to a specific group of customers/target group.

4.6.2 Give TWO reasons why niche markets are becoming more common in the agricultural industry.

(Any 2)

- International recognition of regions in the future, leading to a regional premium – region-related niche market.
- Economic survival as niche marketing does not allow the large debt to expand.
- Technological development may lead to wider variety of products in a small area.
- Smaller farms are more efficient than bigger farms.
- Emotional connection with customers may lead to emotional niche markets.
- Increased demand for quality niche products.
- Increased demand for traceability of niche products.

4.6.3 Give TWO disadvantages of niche marketing.

(Any 2)

- A niche audience might be too small or seasonal.
- A risk of saturation when adequately promoted.
- Niche preferences change over time.
- A significant investment may be needed for diversification.
- Relying on niche can narrow market growth.

Total: 200 marks