

PRINCIPAL EXAMINER'S REPORT



BOTSWANA
EXAMINATIONS
COUNCIL

JCE AGRICULTURE

2022

COMPONENT 2

GENERAL COMMENTS

The report covers Agriculture Paper 2. It reports on how candidates responded to items on the paper. Generally, candidates were weaker than those of the previous year. Centres are encouraged to use this report as a reference point for identifying areas of improvement.

Section 1

Generally, candidates' responses were weaker than those of the previous candidature in all Questions of different levels. Candidates failed to access marks from some of the items which needed application as well as knowledge and understanding. Items on management practices were poorly answered, especially on section B on Goat Production. Candidates also failed to present steps carried out for different procedures in a sequential manner e.g., on Fish Production (section C)

Section 2: Comments on Individual Questions

Question 1

- (a) i. Candidates were expected to name the tool as a Hand trowel. Most candidates provided the appropriate answer.
- ii. Candidates were expected to list two routine checks carried out on a wheelbarrow. The expected answers were to check bolts and nuts/ tightened or missing and Check the wheel. This question was fairly answered. Some candidates wrote maintenance activities.
- iii. Candidates were expected to state the advantages of using equipment in the stimulus (a Tractor) which was presented in the diagram. The question was well answered, and the expected responses were: Work is done faster; Efficient; reduces labour and it never gets tired.

Question 2

- (a) Candidates were expected to name a piece of equipment that can be used to apply fertilizer on a large field. Candidates gave the answer as a planter but were

- expected to write specific names for Fertiliser application equipment since all planters are not applicable. Expected answers were Fertiliser applicator/ spreader; (accept specific names) e.g. vicon spreader/safim planter/ boom sprayer, box type
- (b) Candidates were expected to give advantages of using organic fertilizers on a field'. The question was fairly answered. Candidates gave general advantages of organic fertilisers not being specific to use on a field. The expected responses were, improves soil structure/improves water holding capacity/ water retention; adds microbes; adds trace elements; environmentally friendly;

Question 3

- (a) i. Candidates were expected to name the type of company with a structure presented on the stimulus. The question was poorly answered. Most of the students gave the type of company as Sole trader while the answer was Private limited company.
- ii. Candidates were expected to give a reason to the answer in (a) and the question was poorly answered:

Most candidates failed to justify their answer at 3 (a) (i). The justification was not led by Board of Directors/ led by one Managing Director.

- (a) Candidates were expected to name positions labeled in the stimulus
- The question was fairly answered. Most candidates managed to name M but failed N, they wrote site 3 supervisor. The names were M - sales/ marketing manager;
N - Purchase supervisor/ procurement/ supplies supervisor.
- (b) Candidates were expected to explain why there were more employees under the production manager than other managers. The question was fairly answered. Most students failed to give a reason why there were more employees under the production manager than other managers. The answer was Responsible for the production of products; To increase production.
- (c) Candidates were expected to calculate the total amount required to pay all laborers after all have worked for 5 days and show their working. The question

was fairly answered, Most of the candidates did not show their working for the total number of laborers as thus;

Addition of labourers / $7 + 7 + 7 = 21$
21 labourers x P50 x 5 = P5250

Question 4

Candidates were expected to explain the features of a well-constructed poultry house with the help of a well-labelled diagram to support their answers.

Response to the diagram:

The candidates did not draw a well-constructed poultry house, the expected diagram was to have the following features: an overhanging roof; a brick wall with mesh wire at the midpoint of the door up to the roof.

Explanation

The question was fairly answered. Some candidates explained the construction of a chicken house instead of explaining the features of a poultry house.

The expected answers were

Explanation:

- Lockable door at the entrance for security/ keeping out predators
- Walls should be smooth to prevent pathogen entry/ built using brick and cement for durability.
- A floor made of concrete for easy cleaning.
- Mesh wire between wall and roof for ventilation.
- Over hanging roof to protect against harsh weather conditions.
- Should be of east or west orientation/ side where the sun sets or where the sun rises walls should be high to prevent the entry of sunlight

Question 5

- (a) Candidates were expected to calculate the amount of fertilizer for all crops and show their working.

The question was fairly answered. Some candidates failed to show their working, calculate the area, and give appropriate units,

The expected answer was:

Area: 4m x 5m	=	20m ²	
15 x 20	=	300g	lettuce
6 x 20	=	120g	rape
5 x 20	=	100g	groundnuts
10 x 20	=	200g	guava
10 x 20	=	200g	oranges

$$300 + 120 + 100 + 200 + 200 = 920 \text{ g}$$

- (b) Candidates were expected to name two artificial fertilisers that can be used to top-dress. The question was well answered. Some candidates wrote abbreviations which are not internationally recognized e.g., LAN instead Limestone ammonium nitrate.

The expected answers are Limestone ammonium nitrate; Urea; super phosphate; ammonium sulphate; Muriate of potash.

Question 6

- (a) Candidates were expected to state two ways by which strong winds can affect crops on a field. The question was fairly answered. Some candidates gave the general effects of winds e.g., causes soil erosion.

The expected answers are Lodging of plants/ bending of plants; Uprooting of plants; Increases transpiration; Breaking of plants; Falling/dropping of parts of the plants; Causing wounds to the plants.

- (b) Candidates were expected to describe how crops can be protected from damage caused by wind. They were supposed to use a well labeled diagram to support their answers.

Some candidates drew a diagram without labels' and also failed to elaborate further on how the drawn structure could protect crops from wind damage, especially on the direction of the wind which is the key to the candidate's responses.

Description

The question was fairly answered. Most of the candidates did not give a full description of how crops can be protected from the wind.

The expected responses are:

Plant tall trees / build tall walls; on the direction of the wind; to act as wind breakers.

- (c) Candidates were expected to state three conditions required for a seed to germinate. The question was fairly answered. Candidates gave responses such as warmth, sunlight, and viable seed. The expected responses are Water; Air / oxygen; Suitable temperature.

SECTION B

Goat\Sheep Production

- 7 (a) (i) Candidates were expected to classify the breeds of goats labeled O and P according to their use as shown on the stimulus material. The question was poorly answered, Most of the candidates gave the name of the breeds instead of classification according to their use, and the expected responses were as follows: **O** Meat breed; **P**. Mohair breed.
- (a) ii. Candidates were expected to state the feature for each breed that supports the classification in their answer in 7 (a) (i). The question was poorly answered. Most of the candidates failed to state the feature which supports their answer in 7 (a) (i) and the responses are: **O** large body structure / blocky shape / fleshy body; **P** long hair / long wavy hair.

Candidates were expected to describe two ways by which goats can be protected from diseases. The question was poorly answered. Candidates were stating ways of controlling diseases instead of describing them e.g., culling, vaccination, deworming. Below are expected ways of controlling goat diseases,

- ✓ Provision of shelter/house
- ✓ Administration of vaccines.
- ✓ Proper feeding.
- ✓ Allow animals to move around.
- ✓ Keep animals in a clean environment.

- ✓ Control the movement of animals between zones.
- ✓ Check animals for parasites and diseases before they move from one zone to another.
- ✓ Separate sick animals from the main flock.
- ✓ Provision of disinfectant solution at the entrance of the farm.

- ✓ Administer acaricides and anthelmintics.
- ✓ Remove the sick goat completely from the flock.

Candidates were expected to describe how hoof trimming is carried out on goats. The question was poorly answered. Most of the candidates failed to describe the process of hoof trimming. The expected responses are:

- ✓ Hold the goat with the affected leg;
- ✓ Clean the hoof to be trimmed.
- ✓ Open the jaws of the hoof trimmer.
- ✓ Insert the elongated hoof part inside the trimmer.
- ✓ Press the trimmer to cut the inserted part.

SECTION C BEE KEEPING

Question 9

- (a) Candidates were expected to name any two members of a bee colony. The question was well answered. Below were the expected responses.

Worker; Queen; Drone.

- (b) Candidates were expected to name any tools used to catch bees. The question was well answered, and the expected tools are as follows:

Match box; Smoker; Catch box; Bee brush /quill/feather.

- (c) Candidates were expected to explain three precautions that should be taken when catching bees. The question was fairly answered. Most candidates stated the precautions without explaining e.g. wear protective clothing without giving a reason instead of saying Wear protective clothing to avoid being stung;

- ✓ Avoid wearing perfume to avoid being stung.
- ✓ Avoid making noise to avoid scaring bees.
- ✓ Smoke the bees to make them calm.
- ✓ Catch bees late in the afternoon when they are calm.
- ✓ Avoid catching bees on windy days and rainy days when they are restless.
- ✓ Do not wave arms in panic or run away to avoid the attack.
- ✓ Avoid crushing bees to avoid alarming others.
- ✓ Always have a partner to assist.

Question 10

- a) Candidates were expected to name two products of fish. The question was fairly answered. Most of the candidates managed to state one product and the expected responses are:

Meat; Oil.

- b) Candidates were expected to name any tools used to catch fish. The question was well answered. Most of the candidates named the tools correctly and the expected responses are: Fish line; Net; Hook; Fishing baskets; Spear /wounding gear;Cork;

- c) Candidates were expected to explain the steps that should be taken when processing fish for canning. The question was poorly answered. The candidates

failed to present the steps logically and explain them, Below are the expected steps:

- ✓ Internal organs of fish are removed to prevent rotting.
- ✓ Fish is cleaned to remove dirt for hygiene.
- ✓ Head fins and scales are removed to expose tender meat.
- ✓ Fish is cooked in big pots to kill harmful bacteria.
- ✓ Ingredients such as salt, vinegar and tomato juice are added to add flavour.
- ✓ Fish is put into cans and then sealed to avoid spoilage.

PIG PRODUCTION

None of the students attempted section C question 11.

RABBIT PRODUCTION

Question 12

- (a) Candidates were expected to name any two internal parasites of rabbits. The question was well answered, and the expected responses are as indicated below:
Tapeworm; roundworm; hair worm; liver fluke; coccidian; pinworm; wireworm.
- (b) Candidates were expected to name any two diseases of rabbits. The question was well answered and the expected responses were:
Coccidiosis; rabbit/syphilis/vent; mastitis; weepy eyes/sore eyes/conjunctivitis; enteritis/bloat; ear canker; sore hooks;
- (c) Candidates were expected to explain three preparations that should be carried out before the arrival of young rabbits it was fairly answered. Most of the candidates stated the preparations without giving reasons for carrying them out and the responses are:
- ✓ Cleaning and disinfecting the house and equipment to kill pathogens;
 - ✓ Buying feeds to feed young rabbits.
 - ✓ Buying drugs to control parasites and diseases.
 - ✓ Construct a waterproof hutch with a dark corner for retreatment; Install feeders and drinkers filled with water and feeds to make them readily available;
 - ✓ Placing of litter/ bedding to absorb dropping provision of warmth.

PAPER 4

The 2022 cohort was able to name vegetable crops that they studied but failed to classify them. They were not able to analyse given information to make conclusions. They failed to describe processes for carrying out management practices.

Question 1

- (a) The expectation was for candidates to prepare a complete card of record on vegetable production using given information in order of occurrence (logical presentation), appropriate dates, tools and reasons as indicated below.

Date	Activity	Reason	Tool
March 1 st	Basal dressing	To increase nutrients	Hands
March 15 th	Marking out planting rows	For correct spacing	Tape measure/ruler
	Planting seeds	To produce crops	Hands
	Covering with soil	For the growth/development of a seed	Hands
	Mulching	To conserve moisture/induce seed germination	Grass s/other materials for mulching Watering can
March 22 nd	Mulch removal	Allow sunlight	Hands
April 15 th	Pruning	For air circulation	Hands
	Cultivation	For aeration	Hand fork
May 4 th	Top dressing	Add nutrients to the soil	Hands

*Correct Entry

Most candidates entered all activities as required by the question and stated the correct tools for the activity given. However, some candidates left blank spaces where there was no specific tool to use instead of indicating that they used hands.

* Logical Presentation

Most candidates failed to differentiate between pre-planting, planting and post-planting activities and the reasons for the activities carried out. This was noted when candidates could not differentiate reasons for cultivation before and after planting, seeds and seedlings, basal dressing and top dressing, mulching and removal of mulch. Instead of giving reasons for activities, some candidates defined the activities e.g., pruning, thinning and top dressing.

* Timely recording

Most of the candidates did not state the correct dates using the stimulus (March to May) instead they stated activities that are outside the stimulus. Others congested all activities within a space of one month and could not state the correct interval between activities carried out such as planting and removal of mulch, seedling emergence and pruning.

* Neatness

This component was well done since most candidates made minimal cancellation. Generally, most candidates were not able to prepare a complete card of record. Schools are advised to emphasize the preparation of practical cards under vegetable production.

- (b) i. The expectation was for candidates to name a pest affecting a vegetable studied such as spinach-cutworm, cabbage-aphids, and tomatoes-red spider mites. Most candidates were able to name a pest and a vegetable crop affected. However, some candidates named field crops instead of vegetable crops. The question was fairly answered. Schools are advised to make emphasis on the difference between examples of field crops and vegetable crops.
- ii. The expectation was for candidates to describe the method used to control the pest named in **b (i)** without using chemicals such as; the use of crop rotation to break the life cycle of pests, soil cultivation to expose pests to be burned by the sun, early planting for crops to mature before the onset of pests, use of marigold for pest repulsion, use of scarecrows to scare away birds, pruning of affected leaves to prevent the spread of pests. Most candidates were able to name the method used to control pests but were not able to describe how the method controls the named pest. The question was not well answered. Schools are advised to make emphasis on description of methods used to control pests.

Question 2

- (a) The expectation was for candidates to name the tool used for transplanting a seedling. The appropriate tool used for transplanting is a hand trowel/trowel. Most candidates were able to name the correct tool for transplanting. However, some candidates named a hand fork as a tool used for transplanting. The question was well answered.
- (b) The expectation was for candidates to outline steps taken when transplanting seedlings. The steps involve: watering seedlings a day before transplanting, making planting holes, removing a seedling with soil around the roots using a trowel, taking the seedling to a planting hole, covering the seedling with soil and firming soil to remove air pockets. Most candidates were not able to follow the correct steps when transplanting a seedling. There were cases where candidates mentioned seeds instead of seedlings. The question was not well answered. Schools are advised to emphasize on correct procedure when transplanting seedlings.
- (c) The expectation was for candidates to describe how compact soil would be improved for vegetable production. The steps taken involve: breaking a hard layer/turning the soil upside down using a digging fork/ripper, breaking large lumps using a digging fork/harrow and addition of organic manure to improve soil structure. Most candidates were not able to describe how a compact soil could be improved instead stated the activities of improving compact soil without description. The question was not well answered. Schools are advised to make emphasis on both primary and secondary tillage operations.

Question 3

- (a) The expectation was for candidates to name the type of seedbed suitable for village X which received little rainfall. The appropriate seedbed is a sunken plot. The question was not well answered as candidates were not able to interpret the stimulus given. Schools are advised to impart skills on the interpretation of questions with stimulus.
- (b) The expectation was for candidates to make a diagram of a sunken bed and describe how a sunken bed is prepared. Preparation of a sunken bed involves; digging the soil using a digging fork/pickaxe, taking out topsoil to the sides using a spade, taking out subsoil to make the ridges, taking back topsoil and leveling the soil using a rake. The question was not well answered as candidates were not able to make a proper diagram of a sunken bed and describe how it is prepared. Schools

are advised to impart skills on making diagrams of vegetable beds and steps taken when preparing vegetable beds.

- (c) i. The expectation was for candidates to suggest two management practices carried out in a plot in village **x** which received low rainfall. The management practices are watering, shading, soil cultivation, mulching and the addition of organic manure. Most candidates stated post-planting activities which did not address the question from the stimulus. The question was not well answered.
- ii. The expectation was for candidates to outline steps carried out in one of the management practices suggested in **c (i)** above. One of the responses expected is watering and the steps taken are fit a rose into a watering can; fill the water into the watering can and spread water evenly into the plot. The question was not well answered as candidates were not able to outline steps for suggested management practices instead, they defined the management practice given. Schools are advised to make emphasis on procedures to carry out management practices in vegetable production.

Question 4

- (a) The expectation was for candidates to list two crops that should follow each other in a crop rotation from a given list of vegetables (peas, carrots, broccoli, spinach, tomatoes, beetroots). The crops which should not follow each other are carrots and beetroots. The candidates were not able to select the two crops using the principles of crop rotation. The question was not well answered. The advice to schools is to make emphasis on the understanding of the principles of crop rotation.
- (b) The expectation was for candidates to choose **one** vegetable crop from the list of vegetable crops given and show how the crop is directly planted into the already prepared soil. The steps involve; marking and measuring planting stations at the correct spacing, making planting holes/furrows, placing seeds into holes/furrows, covering holes with soil, mulching and watering. Most candidates were able to complete the process of planting a seed. However, some candidates described the process of planting a seedling instead of a seed. The question was fairly answered.



Question 5

The expectation was for candidates to arrange information given into financial and production records as indicated below;

Production record	Financial records
-Harvested 20 boxes of tomatoes	-Bought 10 packets of seed for P30 each -Paid 2 casual labourers p100 in total - Paid P25 for the water bill -Paid labour for preparing plots

- ✓ Most candidates were able to itemize the information given into production and financial records. However, some candidates included the items under both production and financial records. Schools should emphasise that anything that involves money falls under financial records. The question was fairly answered.