PRINCIPAL EXAMINER'S REPORT

BOTSWANA
EXAMINATIONS
COUNCIL

JCE AGRICULTURE

2024

Advancing learning, certifying your future

PAPER 1: MULTIPLE CHOICE

General Comments

The performance of the candidates was similar to that of the previous year with a mean of 21.57 compared to that of 21.60. As usual, the performance varied across the items with some having very high proportions of candidates getting the item correct while others had very low proportions.

The strongest distractors and distribution of the candidates across the options generally indicate that there were a few misconceptions that were shown by the candidates, and generally they showed mastery of content. The misconceptions and lack of content in a few items should be used to improve the teaching and learning.

Generally, Multiple-Choice items have a guessing factor that is considered to be the lowest proportion of being able to get the item correct without knowing the answer. For a Multiple-Choice item with four options, the guessing factor is 25% and any item which has the proportion of candidates who got it correct lower than the guessing factor is a cause for concern. Candidates should be encouraged to always read the question for understanding before they select an answer. The report is mainly in table format showing the number of candidates at each of the options. The key for reading the table:

N number of candidates that selected the option as their answer

Key the option that was taken as the answer for the item

Comments on Individual Items

Question 1

Option	N	KEY.	Comment
A	1033	C	Well done. The item is an easier topic for the candidates to understand and therefore the majority went for option C. The strongest distractor was D which deals with the production of food in general.
B	715		
C	39442		
D	2218		

Question 2

Option	N	KEY.	Comment
A	3021	C	An easy and understandable topic for candidates. The strongest distractor was D which is not an impact of HIV/AIDS.
B	2331		
C	26341		
D	11715		

Question 3

Option	N	KEY.	Comment
A	2406	D	Well done. General knowledge item that is very easy. Strongest distractor was B, which trains teachers rather than veterinary assistants.
B	8900		
C	1259		
D	30843		

Question 4

Option	N	KEY.	Comment
A	35039	A	Well done. A practical based item requiring recall of processes on the use of tools.
B	2420		
C	3241		
D	2708		

Question 5

Option	N	KEY.	Comment
A	767	D	Well done. Almost all the candidates were able to identify that tool L is used for transplanting.
B	905		
C	900		
D	40836		

Question 6

Option	N	KEY.	Comment
A	2613	D	Well done. Almost all the candidates were able to identify a tool that does not require greasing.
B	3148		
C	1881		
D	35766		

Question 7

Option	N	KEY.	Comment
A	8487	B	Fairly done. The candidates had to look for a disadvantage of the use of machinery in Agriculture. The item was slightly challenging for candidates with many spread across the distractors.
B	24207		
C	6624		
D	4090		

Question 8

Option	N	KEY.	Comment
A	10371	D	Fairly done. Scientific item that requires candidates to exhibit their comprehension of animal nutrition. Some candidates selected iron which is more essential for transport of oxygen.
B	4194		
C	3111		
D	25732		

Question 9

Option	N	KEY.	Comment
A	2372	B	Well done. Simple topic item on use of fertilisers. Almost all the candidates were able to select a group of organic fertilizers from the list given.
B	37286		
C	1834		
D	1916		

Question 10

Option	N	KEY.	Comment
A	4722	C	Well done. An application item challenging candidates on calculations.
B	2176		
C	34045		
D	2465		

Question 11

Option	N	KEY.	Comment
A	10024	B	Poorly done. Good candidates were able to identify the disadvantage of organic fertilisers. Majority of the candidates were spread across options A and C.
B	18544		
C	10641		
D	4199		

Question 12

Option	N	KEY.	Comment
A	2649	D	Fairly done. The scenario enabled the good candidates to analyse the situation given. The strongest distractor was top dressing.
B	3141		
C	15404		
D	22214		

Question 13

Option	N	KEY.	Comment
A	9210	B	Fairly done. An item related to item 12 and therefore the candidates who got item 12 correctly would find item 13 easy. Strongest distractor was fertigation.
B	23316		
C	4090		
D	6792		

Question 14

Option	N	KEY.	Comment
A	8486	B	Poorly done. The majority of candidates did not comprehend the item. The answer attracted the lowest number of candidates even though urea by nature is good for top dressing. Centres are advised to cover the concepts well for candidates to understand and differentiate between the two methods.
B	6577		
C	18431		
D	9914		

Question 15

Option	N	KEY.	Comment
A	4228	C	Fairly done. The candidates were able to pick that the diagram was showing monocropping.
B	1350		
C	29523		
D	8307		

Question 16

Option	N	KEY.	Comment
A	8383	D	Poorly done. The distribution of the candidates across the items shows that they did not understand the characteristics of dairy cows. The majority of the candidates went for a misconception and couldn't get the item.
B	6960		
C	18117		
D	9948		

Question 17

Option	N	KEY.	Comment
A	11193	B	Poorly done. Very few candidates were able to deduce that more space for planting is created by removing stumps. Centres are advised to cover the concept for candidates to understand.
B	15295		
C	4994		
D	11926		

Question 18

Option	N	KEY.	Comment
A	8684	D	Poorly done. A misconception of relating the size of seed and the size of plant. The factors that determine sowing depth are mainly soil texture and size of the seed. The answer attracted the lowest proportion of candidates with most of them settling for size of the plant, which is a misconception.
B	19410		
C	10357		
D	4957		

Question 19

Option	N	KEY.	Comment
A	9677	C	Poorly done. A simple concept that relates to size of seed and planting depth. Centres should cover the relationship between diameter of seed and planting depth in detail which should be roughly more than twice the size of the seed.
B	13161		
C	19457		
D	1113		

Question 20

Option	N	KEY.	Comment
A	4365	C	Well done. Candidates able to pick out that any intruding plant is a weed.
B	2990		
C	32397		
D	3656		

Question 21

Option	N	KEY.	Comment
A	5022	B	Fairly done. Stimulus given used to relate the concept of thinning. Centres are advised to cover pruning and transplanting to differentiate them from thinning.
B	28261		
C	8732		
D	1392		

Question 22

Option	N	KEY.	Comment
A	17995	A	Poorly done. The candidates were expected to select a method that was **cannot** be effective to control rats but their selection shows that B and D were strongest distractors. Candidates should be taught all the different methods and pay attention to the command words.
B	10762		
C	5247		
D	9403		

Question 23

Option	N	KEY.	Comment
A	13103	D	Poorly done. Most candidates were split between options A and B which are mainly mineral and protein supplements. The understanding of the classes of feeds is not well gotten. Centres are advised to cover classification of feeds in details.
B	14925		
C	5070		
D	10309		

Question 24

Option	N	KEY.	Comment
A	22027	A	Fairly done. An easier concept of maintaining animals. The strongest distractor was balanced ration. Centres are advised to cover the purposes of all the types of rations given to animals.
B	5660		
C	13937		
D	1783		

Question 25

Option	N	KEY.	Comment
A	26119	A	Fairly done. Candidates were able to identify classes of diseases though there was a significant number across the options.
B	5797		
C	7772		
D	3719		

Question 26

Option	N	KEY.	Comment
A	2777	D	Fairly done. Candidates were able to pick the correct option that describes the disease.
B	6406		
C	4901		
D	29322		

Question 27

Option	N	KEY.	Comment
A	7789	D	Fairly done. The candidates were able to relate this item to the previous one.
B	3663		
C	3441		
D	28513		

Question 28

Option	N	KEY.	Comment
A	12147	B	Poorly done. The candidates were almost spread across all the options an indication of guess work. The candidates were not able to differentiate between indigenous trees and exotic trees. Centres are advised to classify trees accordingly.
B	14952		
C	6898		
D	9409		

Question 29

Option	N	KEY.	Comment
A	8188	C	Fairly done. Candidates were able to show understanding of materials used to propagate different types of trees.
B	2791		
C	24687		
D	7740		

Question 30

Option	N	KEY.	Comment
A	3080	C	Well done. Majority of the candidates were able to use the diagram to relate it to the concept of layering.
B	3998		
C	33152		
D	3175		

Question 31

Option	N	KEY.	Comment
A	2280	C	Omitted
B	5476		
C	19260		
D	16388		

Question 32

Option	N	KEY.	Comment
A	20300	A	Poorly done. Candidates displayed understanding of the reproductive system of a hen, but many of them failed to identify the part where fertilisation takes place. Centres are advised to cover the details of reproductive system.
B	7893		
C	10176		
D	5035		

Question 33

Option	N	KEY.	Comment
A	2550	D	Fairly done. Candidates able to relate the behaviour of chicks in relation to heat. The strongest distractor was shortage of food.
B	10670		
C	4394		
D	25790		

Question 34

Option	N	KEY.	Comment
A	30589	A	Well done. An application item requiring the candidates to choose a legume from the diagrams of different crops.
B	3284		
C	3047		
D	6483		

Question 35

Option	N	KEY.	Comment
A	20143	A	Poorly done. A recall item for the gestation period of a cow. A significant number thought that the cow requires a full year.
B	5793		
C	3954		
D	13511		

Question 36

Option	N	KEY.	Comment
A	7135	C	Fairly done. Candidates were able to relate the lactating cow to milk fever.
B	5903		
C	26233		
D	4129		

Question 37

Option	N	KEY.	Comment
A	11886	B	Poorly done. A misconception of the concept of the behaviour of consumer and seller. Most candidates settled for number of goods.
B	8872		
C	13102		
D	9534		

Question 38

Option	N	KEY.	Comment
A	1921	B	Fairly done. Candidates who were able to interpret the law of demand got the item correctly.
B	24015		
C	14113		
D	3340		

Question 39

Option	N	KEY.	Comment
A	14105	D	Poorly done. Misconception showing candidates picked A because there are a lot of cattle in Ghanzi.
B	9544		
C	9036		
D	10647		

Question 40

Option	N	KEY.	Comment
A	7815	D	Fairly done. Candidates were able to calculate the profit. A considerable number of candidates were spread across the distractors. Centres should practice with candidates' problems that involve mathematical skills.
B	9086		
C	3154		
D	22692		

PAPER 2: WRITTEN THEORY

General Comments

The report covers Agriculture Paper 2. It reports on how candidates responded to items on paper. Generally, candidates' responses were weaker than those of the previous year, for both application, knowledge and understanding questions. Most candidates were not able to access marks on high order questions. Items on management practices were poorly answered, especially on section B (goat/sheep management). Candidates failed to draw, and label expected diagrams. Centres are encouraged to use this report as a reference point for identifying areas of improvement.

Comments on Individual Questions

Section A

1 (a) Candidates were expected to list **two** levels of production in Agriculture. It was fairly answered with most candidates listing commercial farming and subsistence farming as their answers. Some of the candidates listed types of farming instead of levels.

(b) Candidates were expected to describe **three** ways in which the knowledge of mathematics is useful to a pastoral farmer. It was fairly answered, candidates stated general knowledge in relation to agriculture instead of being specific to pastoral farming. Some failed to state the knowledge gained from mathematics e.g. counting, measuring, calculating instead they described the general knowledge. The candidates were expected to state that pastoral farmers will use mathematics to calculate the carrying capacity of the area; count the number of animals; calculate rations; calculate the yield/production; calculate profit/ loss; calculate dosage of drugs.

(c) The question was fairly answered. Most of the candidates named the correct career opportunity for teaching farmers modern farming techniques and failed to describe agricultural research. They used the word research in their description instead of explaining what research is.

Career group	**Description**
Agricultural demonstrator/ extension officer	Teaches farmers modern farming techniques
Agricultural researcher	Finds out possible solutions to agriculture problems

2 (a) Candidates were expected to explain how drainage can be improved using a stimulus provided. They failed to realise that the soil texture required addition of sandy soil or organic matter to improve the soil structure. It was poorly answered, most of the candidates ignored the stimulus material instead most of the candidates wrote cultivation which was wrong.

(b) Candidates were expected to describe how they could apply urea fertilizer using the stimulus material in (a). It was poorly answered. Candidates failed to describe any of the methods of fertilizer application, which includes digging furrows along the row with sands, putting fertilizers in the furrow, covering with soil, dalloping, etc. instead they explained the methods of fertilizer application.

3 **(a)** A stimulus material describing stumping or de-stumping was presented describing an activity carried out in an area. It was poorly answered. Some candidates did not refer to the stimulus material, most of the candidates gave their response as land clearing which had already been done.

(b) Candidates were expected to describe how the activity in the stimulus is carried out. It was poorly answered. Candidates failed to describe any activity that they wrote. Candidates have a problem in answering items on procedures. They even failed to write tools used in carrying out the activities. The candidates had to present the steps in the order to allow for the removal of the tree: Dig the soil around the stump with a pick, remove the soil with a shovel, cut the roots of the stump at the bottom with an axe and remove the stump from the hole.

4 The question was poorly answered. Candidates were expected to describe layering method in fruit tree production with the aid of a well labelled diagram. The diagram was poorly drawn some of the candidates failed to draw a complete well labelled diagram of layering which includes labelling of the following: a peg, mother plant, a bent branch, soil surface/ground level, developing roots, supporting stick etc. which were supposed to be in the diagram. The description of layering was poorly answered as candidates failed to write their steps logically. The logical steps were bending a branch from the mother plant, burying the part of the plant under the ground while still attached to the mother plant and pinning the branch to the soil or any other method.

5 A stimulus material showing an egg grader was presented as a diagram. Candidates were expected to describe how the equipment is used. The question was very poorly answered, almost all candidates failed to describe how an egg grader is used. Some if the candidates did not know what the equipment was. The egg grader has to be placed on a flat surface and an egg placed on top of the egg holder and reading taken when reader point stops moving.

6 A stimulus material was presented indicating a farmer raising chickens in a rural area where there is no electricity.

(a) The question was well answered. The candidates were expected to suggest any heating method including mbaula, gas, drum etc. that does not require the use of electricity. Candidates were expected to suggest a suitable method of heating the brooding unit that could be used in the area. It was well answered.

(b) Candidates were expected to describe the method of brooding unit named in 6(a). It was fairly answered, most of the candidates did not use the perforated bucket which is very important to let oxygen keep the charcoal burning for the mbaula system. Most of the candidates did not mention that the bucket or the container was perforated.

7 **(a)** A financial report for a vegetable producer was presented. Candidates were expected to prepare a profit or loss account using the financial report given. It was poorly answered, most of the candidates failed to present the correct format for profit or loss account. Most of the candidates presented a format for budget while others presented a format for balance sheet.

Expenditure		Income	
Items	Pula	Items	Pula
Seeds Fertilizers Pesticides Water bill Labour Electricity	150.00 200.00 150.00 300.00 600.00 150.00	Cabbage Spinach Carrots Onions	900.00 500.00 300.00 500.00
Total	1500.00		2200.00

Profit/Loss

P2200.00 - P1550.00 = P650.00

(b) Candidates were expected to state **one** reason for collecting information from consumers before starting an enterprise. It was well answered. Most candidates were able to relate collecting information consumers to see if the business is viable or to see if there is a market or to see if there is demand of the products.

8 (a) Candidates were expected to name any breed of cattle. It was well answered. Most candidates recalled the names that included Tswana and Brahman. There were very few candidates who mentioned other breeds like Afrikaner, Simental and Jersey.

(b) Candidates were expected to state the duration of heat in cows, which is any time between 10 and 18 hours. It was fairly answered as some candidates stated a range.

(c) Candidates were expected to state any **two** possible causes of dystocia. It was well answered. There were many possibilities that included wrong presentation of the calf, overfeeding pregnant cows, mating young heifers, etc. which candidates could choose from.

Section B

Goat/Sheep Production (The Section covers both question 9 and 10)

9/10 (a) Candidates were expected to state **two** reasons for providing goats/sheep with water. The question was well answered as candidates were able to recall at least one reason for providing goats with water. However, some candidates stated that water provides energy which is wrong. The main reasons are water is needed for formation of body fluids / blood / milk, water cools their bodies, water forms part of blood cells and tissues and water helps in digestion / helps to transport nutrients around the body of an animal/helps to remove waste

(b) Candidates were expected to define castration. The question was well answered as candidates recalled that castration is making a male animal unable to reproduce. However, some candidates wrote incomplete definition.

(c) Candidates were expected to name one goat/sheep product. The question was well answered. The candidates recalled that milk and meat are products of goats. There were other options like mohair, skin, manure and horns which were not very popular with the candidates.

(d) A stimulus material showing a syringe fitted with a needle was presented as a diagram.

(i) Candidates were expected to name the tool shown. The question was well answered. The candidates noted that the tool was the syringe.

(ii) Candidates were expected to describe how the tool is used in goat/sheep production. The question was poorly answered. Candidates were not able to arrange steps carried out in a sequential order. One of the methods follows the procedure as outlined: Insert the needle into the medicine bottle/vial. Turn the bottle/vial upside down with the syringe and needle inside. Gently pull back syringe plunger until filled with the correct amount of chemical/medicine/vaccine/anthelmintic. Remove syringe from bottle/vial. Tap syringe to check/remove air bubble.

Section C

Bee Keeping

11 (a) Candidates were expected to name any **two** members of a bee colony. The question was well answered. The candidates recalled some of the members that include queen, drone and worker bee.

(b) Candidates were expected to describe the digestive system of a bee using a well labelled diagram to support the answer. DIAGRAM: Candidates failed to draw a proper diagram of the digestive system of a bee. DESCRIPTION: Candidates failed to describe the proper digestive system of a bee. They failed to state functions of each organ of the digestive system.

The expected response was: Mouth-food taken into the body through the mouth/proboscis. Salivary glands-food pass through it to the crop/honey/stomach. Honey stomach/crop-the nectar gets into the honey stomach temporarily. Water is removed and becomes unripe honey. Intestines-broken food from proper stomach passes into intestines, nutrients are absorbed into the blood stream and sent to different parts of the body. Rectum-undigested food is stored here before released. Anus-undigested food material is released here.

Fish Production

12 (a) Candidates were expected to name **two** types of fish found in Botswana. The question was well answered. Most candidates who answered the question could recall the name of at least one fish from tilapia, catfish, common carp, African pike, salmon and tiger fish.

(b) Candidates were expected to describe how a concrete fishpond is constructed. The question was poorly answered. Candidates failed to arrange steps carried out when constructing a fishpond logically.

The steps required are clearing of the site, measuring and marking with pegs, compacting the remaining soil, putting inlet and outlet pipes, building walls around the area, covering the floor of pond with concrete, plastering inside the wall and allowing concrete to dry.

(c) Candidates were expected to list any **three** equipment/ materials used in catching fish. The question was well answered. Most candidates were able to recall the equipment from the list of

nets, wounding gear, spear, floats, sinker, fishline, cork, bait, basket, hook, etc.

Rabbit Production

13 (a) Candidates were expected to list **two** products of rabbits. The question was well answered. The candidates recalled the products that included meat, skin, pelt, manure and fur.

(b) Candidates were expected to state **two** reasons for housing rabbits. The question was well answered. The candidates were to give any of the listed responses; protection from bad weather, to protect them from predators, to protect them from thieves, for easy management practices and to separate sick ones from healthy ones

(c) Candidates were expected to describe how sexing is carried out. The question was fairly answered. Candidates had the following mistakes: not putting the rabbit on its bag, not able to interpret the observation of either it's a male or a female, they were not able to describe the method used to restrain the rabbit. The process involves lifting the rabbit by the loose skin behind the neck with one hand, holding the animal on flat surface on its back and safely restrain it, bringing the animal genital opening into full view by pressing down the fur around it and gently pressing around the genital area. If it is a buck, a finger like projection will come out; and if it is a doe, the V shape will appear.

Pig Production

14 (a) Candidates were expected to name **two** products of pigs. The question was well answered. Most candidates gave responses from pork, meat, lard, manure and hair.

(b) Candidates were expected to state **three** reasons for housing pigs. The question was well answered. The candidates were to state any reason from protecting them from bad weather, protecting them from predators, separating sick ones from healthy ones, controlling their movement, protecting them from thieves, for easy management practices and preventing them from going astray.

(c) Candidates were expected to describe how teeth clipping is done. The question was poorly answered. Candidates described the process of removing the teeth instead of cutting them. They also placed the clipper between the teeth. The process should be holding the head firmly, opening the piglets mouth, opening the tooth clipper, placing the tooth between the jaws of the clipper and pressing the clipper to cut the tooth.

PAPER 3: COURSEWORK

General Overview

Generally, crops were mature but had not reached the marketability stage. In a few centres crops were still at seedling stage. Damage of crops was observed in a few centres. In some instances, few candidates within a centre presented empty plots and two centres presented empty plots for all candidates alluding to shortage of water as a failure to do the project. There was also a challenge of levelling across the country. Nonetheless most centres presented very good and healthy crops.

Areas Covered

Layout: Cover Ridges, Levelling and Measurement

1.1 Ridges: The expectation was to find four well defined ridges which will keep water in the plot. Well-constructed ridges were found in most centres.

1.2 Levelling: The expectation was to find plots that are not sloping. In most centres plots were not level. Most plots were jagged/lumpy in the middle or showing signs of water flowing to one side of the plot.

1.3 Measurement: The expectation was to find a 2 m × 1 m plot. Most Centres adhered to the set standard while in some few Centres plots were smaller than the expected measurements.

Cleanliness: The expectation was to find clean plots which are free from weeds and other materials that can hamper plant growth. Generally, plots were clean in most Centres.

Cultivation. The expectation was to find well cultivated plots with a fine tilth. Plots were not well cultivated; clods were not broken after cultivation in some Centres.

Population. The expectation was to find correctly populated plots. The population is based on the recommended spacing given below:

CROP	INTER ROW SPACING	INTRA ROW SPACING
Egg plant	60 – 90 cm	45 – 60 cm
Spinach	40 – 60 cm	20 – 25 cm
Swiss Chard Onion	25 – 60 cm	10 – 15 cm
Beetroot	25 – 60 cm	10 – 15 cm
Rape	40 – 60 cm	20 – 40 cm
Runner beans	50 – 60 cm	20 – 30 cm
Radish	25 – 40 cm	5 – 10 cm
Cabbage	40 – 60 cm	40 – 50 cm
Garden Peas	30 – 60 cm	10 – 15 cm
Tomatoes	40 – 60 cm	30 – 50 cm
Dwarf beans	50 – 60 cm	15 – 20 cm
Sweet Pepper/ Green Pepper	60 – 80 cm	30 – 45 cm
Kale/ Choumoellier	40 – 60 cm	20 – 40 cm
Carrots	25 – 60 cm	10 – 15 cm
Spring Onion	15 cm	1 – 5 cm

CROP	INTER ROW SPACING	INTRA ROW SPACING
Okra	50 cm – 60 cm	20 – 40 cm

The expectation was to find a correctly populated plot based on the formula given below:

Example: plot size 2 m × 1 m with a crop spaced 15 cm between plants (intra-row spacing)

$$\text{crops in row} = \frac{\text{length of plot} - 20\text{ cm} + 1}{\text{intra row spacing}}$$

$$13$$

Plots were correctly populated though under population was observed in beetroots. In most centres both the inter-row and intra-row spacing were correctly maintained except in some few plots where the intra-row spacing used was inconsistent.

Thinning: The expectation was to find one plant per station. Most crops were properly thinned even though there were a few which were crowded.

Uniformity of crops: The expectation was to find mature plants at the same growing stage. Most plants were mature and at the same growing stage. NB uniformity does not mean that crops should be at the same growing height but growing stage. e.g. flowering, harvesting stage etc. In few centres plants were at different growing stages e.g. seedlings and mature ones.

Colour. The expectation was to find crops with appropriate colour to the variety grown. The colour of the crops presented was appropriate to the variety grown.

Crops Presented

Spinach, Onion, Kale, Rape, Beetroot, Sweet Pepper, Tomatoes, Runner beans, Eggplant, Radish, Spring onion, Okra.

Comments On Individual Crops

Spinach

The expectation was to find green, marketable, well pruned and fresh crop. Generally, the crops were marketable but there were few instances where seedlings were found. Pruning was also not well done since tillers and overgrown leaves were left and there were a few centres in which the growing point was removed.

Onion

The expectation is to find a fresh, marketable, well-trimmed crop with an exposed bulb. Generally, the crop was mature but not marketable. Centres are advised to plant as early as a January. In some centres bulbs were earthed up and some plants under shade which resulted in poor bulbs since onion is a light crop. To avoid poor bulbs onion crops should not be planted deeply. Splitting was also noticed in some centres. This could have been caused by too much humus in the soil, deep planting and harm to the bulb through use of wrong of wrong tools. Trimming was not well done. Cultivation must be done correctly.

Rape

The expectation was to find fresh, well pruned and marketable crop. Crops were mature. However, there were a few instances where crops were not marketable. Pruning was not well done since some leaves which deserved to be pruned were left. Candidates should be encouraged to prune on time.

Beetroot

The expectation was to find fresh, mature, earthed up and marketable crop. Beetroot crops were mature but not marketable in most centres. In some centres the beetroot was still at seedling stages. Pruning and earthing-up were not well done. Candidates should ensure that roots remain covered after watering and pruning should be done. Damage by mole rats was recognised while some crops were uprooted by candidates.

Sweet Pepper

The expectation was to find a fresh, marketable and supported crop. In some centres, the crop was mature and marketable while in other centres the crop was not mature. Supporting was well done in some centres whereas others did not tie the stem of the crop to the stick. Proper supporting should be done by tying the stem of the crop to the stake.

Runner beans

The expectation was to find fresh, mature, marketable and well supported crops. In some centres, the crop was mature and marketable while in other centres the crop was not mature. Crops were not well supported. In some centres the crop was poorly supported since the pods and the leaves were touching the ground. Frequent trimming or pruning of lower branches should be done to avoid early bearing of fruits which leads to pods and leaves touching the ground.

Radish

The expectation was to find a fresh, mature, pruned, earthed up and marketable crop. The crop was generally fresh, mature, well pruned, properly earthed up, and in some centres they were not marketable.

Tomatoes

The expectation was to find a fresh, well supported, pruned, mature and marketable crop. Generally, the crop was mature but not marketable. The best way to support the crop would be to either trellise so that the branches do not fall over or prune continually if the crop is to be staked. Candidates are advised to shade the crops to avoid damage by birds

Eggplant

The expectation was to find fresh, matured, supported and marketable crop. The crop was mature and marketable . Stakes were placed but they were not serving the purpose. The crops should be tied to the stakes to ensure proper supporting. Planting should be done early so that the crop is ready at moderation time.

Kale

The expectation was to find fresh, well pruned and marketable crop. The crop was mature and marketable. In some plots pruning was not done at all while in some plots tillers were present.

Okra

The expectation was to find fresh, mature, marketable, supported and well pruned crops. The crop was not mature. Candidates are encouraged to plant early.

CARDS

Correct Entry

The expectation was to find described activities and a list of tools used. Most centres were able to describe the activities along with the tools used. Some candidates continue to define activities instead of describing. In some instance candidates did not describe the activities as well as giving correct reasons.

Correct Reasons

The expectation was to find one or more relevant reasons for the activity done. Most of the reasons given by candidates were relevant. However, in a few instances reasons were irrelevant.

Timely Recording

The expectation was to find correctly timed activities (dates and intervals). Most activities were correctly timed. However, in some cases nothing was recorded during the month of April. NB. A card without dates is not regarded as a record. In some instance dates were wrong.

Logical Presentation

The expectation was to find activities correctly following one another. In most centres activities were correctly following one another as expected.

Neatness

The expectation was to find cards with minimal cancellation and soiling. Cards were neat with minimal cancellation and no soiling.

RECOMMENDATIONS

Cards

-Candidates should desist from writing cards in verbatim and are encouraged to show originality in writing the cards. They should be able to describe activities in their own words and avoid copying.

-The expectation is to find a detailed complete cards with all activities clearly described.

-Special needs candidates should be helped accordingly in card writing.

Plots

Aspect of levelling should be looked in to in the mark scheme.

School moderation schedule should be looked into to allow equity in all centres and should reach schools end of third term.

DOMESTICS ISSUES

-Issue of tax needs to be looked into and clarified especially subsistence being taxed.

-No proper communication regarding moderation claims changes/deductions and all BEC activities should reach centres on time.

-All fees need to be reviewed; they have been overtaken by time.

-Moderation package materials should be ready at the time of departure for moderation (boards, calculators, airtime and checklist).

-In allocating schools for moderation distance between schools should be considered and should

accommodate remarking as well as the moderator's workstation. Days allocated to schools should be according to candidature and should be more than 1 day to allow all activities to be carried out.

-Examination venues should be well prepared and resourced.

-On the comparison sheet for computing scale factor a column of totals should be included.

PAPER 4: ALTERNATIVE TO COURSEWORK

1 **(a)** The expectation was for candidates to name one example of a vegetable they have studied such as beetroot, carrot, onion, rape, spinach, tomato, garlic, cauliflower, pea and okra. Most candidates were able to name an example of a vegetable.

(b) The expectation was for candidates to describe planting of seeds such as: Digging furrows or planting holes. Placing seeds in furrows / planting holes. Covering with soil. Most candidates made holes and placed seeds in the hole but did not cover with soil.

(c) The expectation was for candidates to describe the checking for diseases in the vegetable crop named in 1(a) such as: Hold the plant leaves /stem/ fruit/ with hands. Look closely to search for signs/symptoms of diseases. Most candidates did not mention the holding/handling of the crop for easy inspection.

(d) The expectation was for candidates to describe harvesting of the crop such as:

Harvesting spinach/rape/choumoellier: Cut the outer leaves with a sharp knife just above the ground surface. Using hands hold the leaf and twist it at the base above the ground surface. Candidates were able to describe the part removed but failed to state the position.

Harvesting beetroot/ carrot/onion: Hold the leaves with hands and uproot. Use a hand-fork to remove the crop without damaging it. Most candidates were able to answer it correctly.

Harvesting pea /bean: Hold the plant with one hand and gently twist to cut the pods from the plant with your other hand.

Harvesting tomato: Hold tomato fruit with hand, twist and cut fruit from the plant with hand/ knife/ garden clippers

Candidates failed to describe how the fruit is detached from the plant.

2 **(a)** The expectation was for candidates to name the equipment shown, knapsack sprayer. Most candidates were able to name the equipment.

(b) The expectation was for candidates to describe how the equipment is used to control weeds. wear protective clothing fill it with required amount of water add the required amount of chemical to the water mix chemical with water pump to build pressure in the tank Press the trigger to release the chemical. Candidates failed to mention; pumping to build pressure in the tank and press the trigger to release chemical.

(c) The expectation was for candidates to state ways in which they would protect themselves from being affected by the chemical used in the equipment such as wear protective clothing /gloves /boots /masks /overalls /goggles. Read and follow instructions. Do not eat/ smoke when using the chemical. Most candidates could not state that you spray along with the wind, instead the statement they wrote implied they were spraying against the wind.

3 The expectation was for candidates to complete the record card by providing the missing information under date, management activity, reasons for the activity and tools used.

Date	Management Activity	Reason for activity	Tool used
01 / 01 / 21	Planting	To develop new plants	Hands
(b) 03 /01/21 to 21 / 01 / 21	Removal of mulch	(c) To avoid etiolation Photosynthesis Harbour pests	Hands
09 / 01 / 21	Watering	(d) To cool plants; dissolve nutrients; encourage photosynthesis; cool soil; transport nutrients	Watering can
11 / 01 / 21	Weeding	(e) To avoid competition for water; nutrients, air, space, light, improve aeration and drainage; harbour pests	Hoe/hands
15 / 01 / 21	(f) Thinning	To create space for the remaining crops	Hands

Candidates were able to state the tool used. Candidates were able to give correct dates that is they fell within the correct range for a variety of crops. Some candidates were giving reasons for mulching instead of removing mulch. Most candidates wrote the correct reason. Most candidates wrote the correct reason. Candidates wrote the correct management activity.

4 **(a)** Candidates were expected to complete the table by giving the name and class of any two vegetable pests they have studied

Name of pest	Class
Locust/beetle/termite/grasshopper/corn cricket	Biting and chewing
Aphid/bagrada -bug/red spider mite	Piercing and sucking
Stalk-borer; American boll-worm Cut-worm Rats	 Boring Biting and chewing

Candidates were able to name the pest but failed to classify them. Candidates should be made aware that pests can be classified according to the type of damage they cause

(b) Candidates were expected to identify the pest shown such as beetle or ten lined June beetle. Few candidates were able to identify the pest as a beetle but failed to give the specific name

(c) Candidates were expected to describe environmentally friendly methods that can be used to control the pest identified such as **physical/mechanical method** use of plant traps /hand picking/applying floating covers/row covers.

Cultural method planting crops early /planting different crops following a particular sequence

Biological method: use of predators such as praying mantis

Quarantine and legislation: restriction in the movement of crops

Home-made remedies: Use of garlic, chillies and marigold

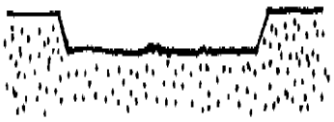
Candidates were able to give the method but failed to describe it.

5 **(a)** Candidates were expected to calculate the amount of fertilizer required to be used for a plot size of 4 m × 1 m with an application rate of 14 g / m^2. Candidates were failing to give the correct answer showing that they lack computational skills. Candidates failed to give correct units.

Answer: 56 g

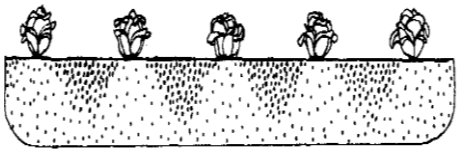
(b) Diagram

Sunken seedbed



Raised seedbed

Flat seedbed



Candidates were able make diagrams of a plot but were failing to make correct labels. Description: Measure length and width/dimensions of plot. Dig/cultivate the soil. Make a hip for raised plot /remove soil to required depth for a sunken plot. Make the ridges/level the surface. Most candidates failed to describe how the plot is prepared for vegetable production.

(c) The expectation was for candidates to outline the steps followed when transplanting a vegetable seedling such as water the seedling a day before transplanting, prepare a planting hole, lift the seedling with soil around roots using a trowel, place the seedling in the planting hole, cover the hole with soil, press down the soil firmly around the stem of the seedling, shade the seedlings. Some candidates were covering the hole with soil without firming while some were firming without covering the hole with soil.