EXAMINATIONS COUNCIL OF ESWATINI

Eswatini Prevocational Certificate of Secondary Education

Agricultural Technology (5920)

Examination Report for 2023

Table of Contents

EPCSE AGRICULTURE TECHNOLOGY

Paper 5920/02

Theory

General Comments

EPCSE Agriculture Technology Paper 2 consists of two (2) sections, **SECTION A:** - Structured Questions and **SECTION B**: - Essay questions. This paper contributes 40% of the overall mark.

SECTION A: Short Structured Questions

Section **A** required candidates to answer **all** questions. 60 Marks were allocated for this section.

Question 1

Fig. 1.1 shows a poultry house.

Fig. 1.1

(a) State any **two** ways the roof structure could be adapted to regulate temperature in **Fig. 1.1**.

Expected response:

Overhanging roof; transparent roof; insulated roof/ grass; by elevating the roof.

Comment:

This question was generally not well answer answered by most candidates. Responses from some candidates which were not appropriate were as follows:

Roof must be concrete, put corrugated roof, fence the roof, put light bulbs, close the roof holes so that rain does not enter, cover the roof with plastic, provide air circulation to move air, add brooders on the roof, ventilate the roof with water.

(b) Suggest any **two** other ways in which temperature can be regulated in **Fig. 1.1**.

Expected response:

Use of curtains; provide fans/ air conditioners, spraying the roof with water; use of diamond mesh fence instead of concrete on the wall; provide brooders/ heaters; observe proper stocking rate.

Comment:

This question was well answered by most candidates, but some candidates did not understand the question as a result they gave the following inappropriate responses: put poultry house under a tree, have a small window on the animal house with burglar proofs, the walls and temperature regulate, through sawdust temperature can regulate, covering the outside part of the poultry house.

(c) Explain the best direction for a poultry house on a farm.

Expected response:

The long side should face the east-west direction to prevent direct sunshine over the birds; must face the direction of the prevailing wind; to enable air circulation.

Comment:

Most candidates failed to answer this question, some of the inappropriate responses were: face the sunrise with closed walls, away from house for people, should face the house of the farmer so that he can see thieves, it must be a distance away from the farm houses to avoid too much noise, face south so that chickens get fresh air every day, east, west to avoid the smell coming from poultry house.

Question 2

(a) Explain how very low temperatures affect egg production.

Expected response:

feed is used to generate heat; feed not available to produce eggs.

Comment:

Most candidates were able to give correct responses, the inappropriate responses from candidates included the following; stress layers and reduce egg production, chicken lay small eggs, no heat so the layers lay small number of eggs, egg production rate is low because sunlight is important in egg production, temperature affect egg production in such a way that it does not act heat so it will affect the length of the day.

(b) Describe the tasks needed to ensure deep litter is managed effectively in a poultry house?

Expected response:

remove wet patches of litter; mix damp litter with dry litter; fork the litter at least twice a week; change the litter as per the need.

Comment:

This question was responded well to by most candidates. The inappropriate responses were; change water trough correctly, collect eggs three times a day to avoid hens from eating them, close the roof so that water does not enter when it is raining and this cause pests and disease, proper ventilators do the task, good footbath, clean and disinfect the floor.

Question 3

(a) State **two** reasons for using rough concrete for the floor of a pig house.

Expected response:

to prevent digging the ground; to prevent slipping; aid stability during mating; easy to clean concrete.

Comment:

Most candidates answered this question well, wrong responses were**;** to slope the house, to keep floor dry and pig from being dirty, for pig to sleep nice on the floor, to regulate good, cool temperature for pigs, to make the floor very strong so that pig sleep nice.

(b) State **two** reasons for providing a slightly sloping floor in a pig house.

Expected response:

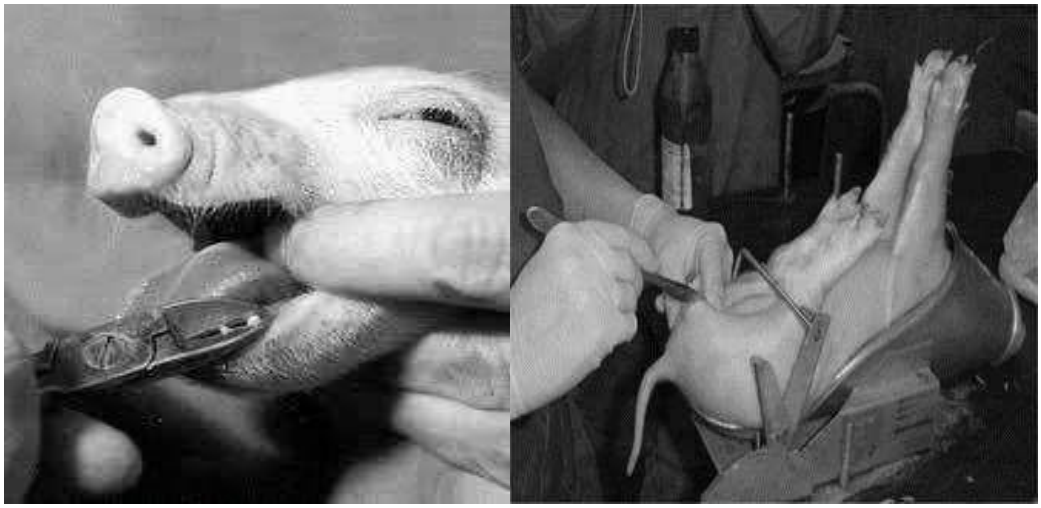
for easy cleaning; for drainage.

Comment:

Most candidates got this question correctly ‘cleaning’ but not the ‘drainage’, the inappropriate responses included; for pig to move well, allow piglet to move freely, to split the urine and roll faeces, for easy melting when want to melt the pig, the sow to balance during the reproduction, so that when it rains on the roof the water will just flow down, too avoid damping-off, allows water to be easily carried away after cleaning, to make the big sleep nicely on the floor. Name the medications given to pigs during the following stages.

Question 4

Fig. 4.1shows management practices done on piglets.



A **B**

Fig. 4.1

(a) Identify and give a reason for the management practice shown by photograph **A**.

(i) Name of practice …….....

(ii) Reason ……..……..……..……

Expected response

(i) needle teeth clipping

(ii) prevent injuries to the sow when piglets are suckling; prevent injuries to other piglets.

Comment:

Majority of the candidates were able to identify management practice as teeth clipping, and the reason for the management practices to prevent injuries to sow when milking and to the other piglets. The inappropriate responses included the following: to prevent diseases, to avoid the mother when breast feeding, to avoid accident when killing a pig, to avoid suckling the teat mother sow, so that gilt could not eat something that is contagious.

(b) Identify and give a reason for the management practice shown by photograph **B**.

(i) Name of practice…….....

(ii) Reason…….……..……..

Expected response:

(i) castration

(ii) to prevent boar taint; prevent breeding.

Comment:

Some candidates did not provide a response, some candidates identified the management practice as: injecting the anus, vaccination, melting, dehorning, tail docking, weaning, injecting piglet which were wrong. The reason for the management practice identified as: to avoid flirting each other, so that they can be no disease, for big to be strong and very big, for strong bones, improves growth in piglets, pig can give birth easily, prevent unwanted melting, to kill similar characteristics, to produce quality meat, not to be a boar when is grown up, anaemia were also wrong.

(c) State the appropriate age at which piglets are weaned.

Expected response:

4 to 6 weeks

Comment:

The question was generally well answered by most candidates although a few candidates had the following wrong responses:12 days, 21 days, 1 week, 2 weeks, 3 weeks, 2 months, 3 to 6 months, 3 months 3 weeks 3 days.

Question 5

Fig. 5.1 shows a method of controlling goats.

Fig. 5.1

(a) **(i)** State the method of controlling goats shown in **Fig. 5.1**?

(ii) Suggest why this method would be preferred over herding.

Expected response:

(i) Fixed picket tethering

(ii) lack of herd boys; good to manage fewer goats; cheaper than herding, manage troublesome goats; efficient use of grazing land.

Comment:

A majority of the candidates gave correct responses to the question except for a few who identified the method of controlling goats as: chain tethering, running tethering, pole tethering, rope tethering, over herding, Isolation, T- ring, roping, picketed tethering, stational rearing, rope herding, T-budding. The candidates also stated the reason(s) for engaging this type of a method to protect goat from dog, prevent unwanted mating, makes goat eat in one place, goats are force to graze even poor grass and they finish them, goat eat in a huge

(b) Explain *steaming-up* in goats.

Expected response:

quality feeding of nanny; to maximize milk production/ kids growth rate.

Comment:

A majority of the candidates attempted to give the correct responses but the responses had some errors which include the following: provision of goat with grains and a lot of greens, vaccination of goat to protect them from diseases, giving goats extra feed before mating, putting goat in a tether and collect it in the evening, reduce milking a nanny so that it get to heat fast, cutting wet grass and feeding goat when dry, milking the first milk, starving goat before giving birth to burn milk, increasing feed to stimulate ovulation in nannies, when you are supporting the goat when giving birth.

Question 6

(a) State **two** methods of planting vegetables.

Expected response: direct planting; indirect planting/ transplanting.

Comment:

A majority of the candidates responded well to the question, but a few gave the following wrong responses: digging hole, planting in rows, planting in furrows, broadcasting, seedbed, seed trays, intercropping.

(b) Define fertigation.

Expected response: use of fertilizer in a liquid form/ addition of fertilizer in an irrigation system.

Comment:

A majority of the candidates responded poorly to this question as they gave the following wrong responses: when fertilizing the soil with manure, application of fertilizer before planting, removal of unwanted chickens in a poultry house, to test fertilizer to a plant, planting on fertilized land, a process of fertilizing vegetables with rich nutrients, a method of watering in the farm, a mixture of two fertilizers and irrigation, application of fertilizer when there is too much water.

(c) Explain why a compost heap may take too long to be ready.

Expected response:

microbial development may be slow due to lack of nitrogen; slow action of microbes due to shortage of air/ wet conditions/ dry conditions.

Comment:

A majority of the candidates failed to give correct response to the question, the wrong responses they gave included the following: compost heap have a lot of nutrients, because other materials may take too long to decompose, compost was put in a shade so it does not get sunlight, compost needs time to decompose thoroughly on the soil, for the layers of the compost to be more fertile, the layers were not turned by the farmer, there was lack of rain water that will mix the layers, it needs a long time to rot, turn the layers every after 2 weeks to make it ready.

Question 7

Fig. 7.1 shows a knapsack sprayer.

Fig. 7.1

(a) Identify the part labelled **D** in **Fig. 7.1**.

Expected response:

nozzle

Comment:

Most candidates failed to identify part D as a 'nozzle', their wrong responses included: nosol, pointer, wand, nozolo, noodle, outlet, lid, tap, reducer, spray needle, valve, sprilder spray.

(b) State the function of part **D** in **Fig. 7.1**.

Expected response: forms the spray pattern/ breaks fluid into fine droplets.

Comment:

Only 10 candidates out of the 102 candidates who sat for the examination were able to state the function of part **D**. The following were some of the wrong responses: cused for spraying, comes out chemical, chemical get out of sprayer, make chemical spread abroad and in a suitable way, split the chemical into the weeds and the plants, to direct the water supply by the sprayer, discharge the chemical when spraying.

(c) Calculate the amount of chemical needed for a 15L sprayer if the rate of application is 5g per 20L of water.

Expected response:

5g ----------> 20L

Xg ----------> 15L

5g x15L = 20L x Xg

$\frac{75gL}{20L}$ = **3.75g**

Comment:

Very few candidates were able to solve this problem correctly.

(d) Give **two** reasons why it is not recommended to spray on a windy day.

Expected response:

to prevent chemical wastage; to avoid spraying of unintended plants/ to avoid the chemical from being blown away; to avoid the chemical being blown to the user/ farmer.

Comment:

Most candidates were able to give correct responses for this question. Some candidates gave wrong responses such as: the wind can remove the chemical, destroy the soil structure, the chemical cannot work.

Question 8

(a) Differentiate between crop rotation and mono-cropping.

Expected response:

Crop rotation is the growing of different crops on the same piece of land each growing season following a certain sequence yet mono-cropping is the growing of one and the same crop on the same piece of land each growing season.

Comment:

Most of the candidates gave good responses for this question. Some candidates gave responses which had the following errors: monocropping is the growing of two crops in the same place every year, cop rotation is the growing of 4 crops in one field every year.

(b) State any **two** things to consider when choosing a suitable crop variety.

Expected response:

Cultivar that is tolerant to the climatic conditions of the area; high yielding cultivar; resistant to pests and diseases; end use of the products; farmers' choice; time of planting.

Comment:

Most candidates gave wrong responses which were as follows: soil structure, sunny place, near a source of water, spacing of crop, good pH, size of the variety, soil profile, quality and quantity of seeds, suitable garden, using systemic pesticides.

(c) State any **one** control measure used to prevent maize streak virus.

Expected response: use of resistant varieties; crop rotation; remove crop residues; control insect vectors.

Comment:

This question was poorly answered by most candidates. Some of the inappropriate responses were as follows: Spraying, chemical control, spray with Dithane M45, spray with vaccine, spray with malasol, plant across slope, intercropping, mix old produce with new produce together, biological control, correct planting.

Question 9

(a) Differentiate between grafting and T-budding.

Expected response: grafting is the process of joining scion and a rootstock together to grow as one plant. T- budding is when a piece of bark containing cambium is attached to a rootstock.

Comment:

This question was poorly answered by a majority of the candidates, their wrong responses included the following: grafting – cutting the edges of a fruit trees, removal of a hard layer of tree for propagation, are two different processes with variety of fruit tree, the branch is completely cutted with knife, cutting small

teeth of piglets, cutting different trees to form one, cutting a piece of tree and plant it, connecting different sizes of pipes according to variety.

T- budding – introducing a tree to sexual reproduction, the branch is cutted to T- shape at an angle, cutting a T- shape on to a plant, cutting same tree and put same tree to form one tree, you cut branches and put another one, cutting the brench of orange tree to join a lemon T shape tree, connect pipes going to different directions.

(b) State the procedures followed for processing fruits.

Expected response:

selection of fruits; sorting and washing fruit; juicing/ slicing/ segmentation

Comment:

Candidates were not able to state the correct responses for procedures for processing fruits.
The candidates wrong responses were as follows: planting hole preparation, harvesting rules, packaging and storage of fruits, grow fruit trees that are disease free, grow trees that are easy and fast to ripe, fruit must be picked during the day and processed same day, do not process over ripe fruits, place them in dry containers and keep in cool dry place, throw away spoiled fruits away and store good ones, prune fruits water them and fertilize them, handle fruit trees well, pick and package fruits properly.

Question 10

(a) State **one** farming practice that contributes to soil erosion.

Expected response:

cultivating down the slope; extensive cultivation; excessive irrigation; overgrazing; cattle tracks; deforestation; burning grass at the wrong time; mono-cropping.

Comment:

This question was well answered by a majority of candidates; a few candidates gave the following wrong responses: contour ploughing, mixed farming, bad farming methods.

(b) State the importance of a fire break in a farm.

Expected response:

helps to avoid fire escape on a farm

Comment:

Most candidates answered this question well, although a few had the following wrong responses: prevent soil erosion, improve the soil fertility, extinguish fire caused in the farm, burn out weeds making field easier for cultivation, to kill and destroy soil organism in the farm, help give pathway when stopping

fire, to prevent the flow of water, you can easily escape when there is fire in the farm, protect from predators in the farm.

(c) Explain the importance of rotational grazing in conserving the environment.

Expected response:

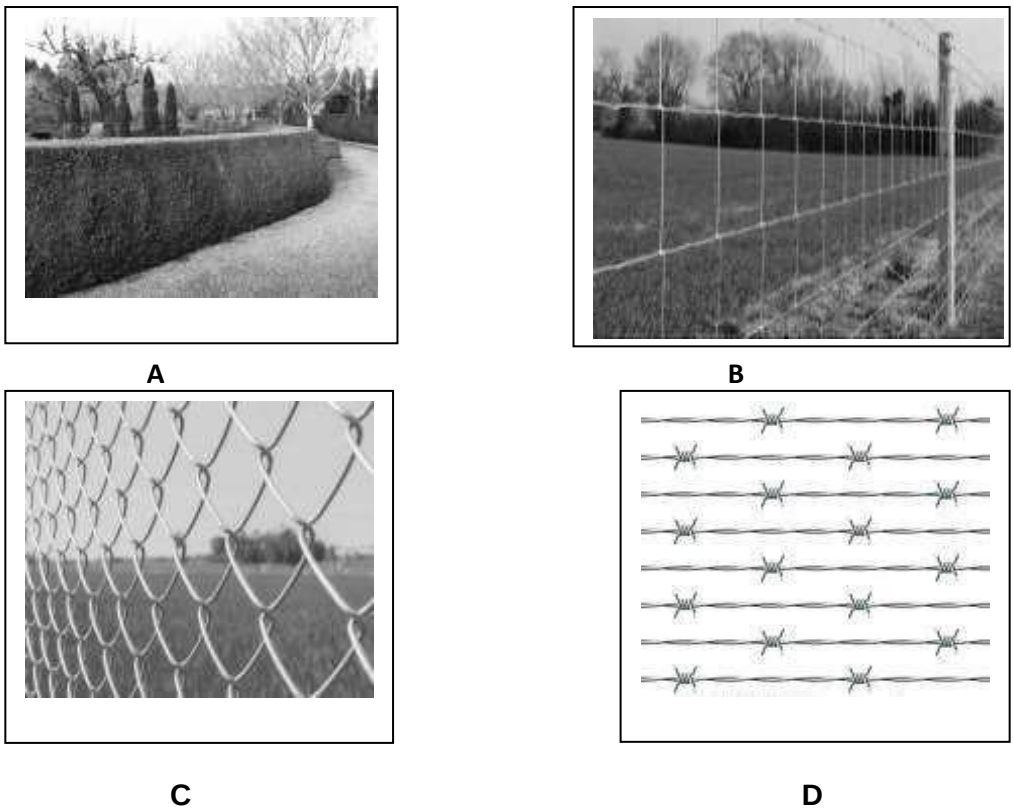
ensure complete vegetative cover (avoids overgrazing); vegetation cover ensures high rainfall infiltration rate; decreases the risk of soil erosion; increases production of desirable grass species.

Comment:

This question was well answered by a majority of the candidates. A few candidates thought that the importance of rotational grazing in conserving the environment; is to help soil to be conserved.

Question 11

Fig. 11.1 shows different types of fence.



(a) Identify the different types of fences shown in **Fig. 11.1**.

Expected response:

A. Live fence/ hedge

B. Veld-span fence

C. Diamond mesh/ wooven fence

D. Barbed wire fence

Comment:

This question was not well answered by most candidates. Candidates had the following responses for the different types of fences.

A: some candidates had no response, other responses were: concrete fence, horticulture, wall fence

B: Inappropriate responses included: rail and pole fence, barbed wire, electric fence, veld fence, square fence, donor fence.

C: some candidates had no response, other responses were; wire fence, bib fence, and diagonal fence.

D: Inappropriate responses included: straight line fence, bulb fence, electric fence, star wire fence, wire only fence, line fence, and Daladi.

(b) State the role of droppers in fence construction?

Expected response:

droppers help support fence; strengthen fence; space barbed wire fence/ prevent sagging.

Comment:

The question was well answered by a majority of the candidates. A few candidates stated the following wrong response to the question: strecthes fence, prevent ledging in fence, strengthen the fence on the fence, droppers prevent thieves to enter in the farm, support struts very strong.

Question 12

Fig. 12.1 shows a farm implement

Fig.12.1

(a) Identify the implement shown in **Fig. 12.1**

Expected response:

planter/ seed driller

Comment:

The question was not well answered by a majority of the candidates. Some of the wrong responses were as follows: Disc plough, harvester, ripper, mouldboard plough, tractor drawn implement, hammer mills, bound bin plough, harvesting machine, ribber, planting machine, grinder tractor mill.

(b) Describe how the implement in **Fig. 12.1** carries out its function.

Expected response:

opens the planting furrows; meters the seeds; deposit seeds in furrows; cover seeds and compact soil around them.

Comment:

The question was well answered by a majority of the candidates. A few of the candidates responded as follows: dig out the soil, dig out lines and plant seedlings, plant maize seedlings and pumpkin seedlings, it plant and what it has planted it go outside, by digging and moving the soil on the field, tractor drawn implement waste the seeds too much, tractor does not cover well seeds and birds eat them.

(c) Explain any **one** disadvantage of using a tractor-drawn implement.

Expected response:

Tractor is heavy so it compacts the soil; tractor exhaust release smoke so pollute air; tractor operation and repair is complex so need skilled labour; tractor and implements are expensive to buy and service; tractor and implement operation in the farm covers a large area of land within a short space of time so they displace human labour.

Comment:

This question was poorly answered by a number of the candidates as they stated the following wrong disadvantages for the question: kills some plants during harvesting, burry seeds deep in the soil and do not germinate, drops a lot of seeds in one hole, not able to harvest tall maize plants, difficult to adjust the spacing of the implement when planting seedlings, cannot be use in a steapy area, it damages the soil and make it loose and it makes dongas.

Section B

This section consisted of **40 marks** and candidates were required to answer any **two** questions.

Question 13

(a) Describe any **two** advantages of growing ornamental plants in a greenhouse.

Expected response:

Longer growing season as it offers more controlled climate and swinging temperatures won't put plants at risks; weather protection from harsh conditions such as high temperatures, frost and strong winds; a variety of plants which offers a much warmer and humid environment**; economically more profitable** as plants grow fast and fetch higher price in the market.

(b) Describe the procedure for potting plants.

Expected response:

Choose an appropriate pot size with drainage holes, cover the drainage holes with porous material like a coffee filter; add a thin layer of pebbles/sand, add compost or soil mix in the pot; remove dead leaves, shake away some old soil and untangle the roots; place the plant at the centre of the pot, fill the sides with fresh soil mix; press the mixture lightly to remove air pockets; water the plant until water drains out from the holes.

(c) Discuss management activities needed for indoor plants.

Expected response:

Temperature control, exposure to sunlight, watering, fertilising and re-potting responses.

Question 14

(a) Describe the economic importance of apiculture in Eswatini.

Expected response:

Income generation: from the sales of honey and by-products like wax, pollen and propolis; **Job creation**: individuals are hired to harvest and process honey together with products; **pollination**: the pollination of flowers by honeybees during their gathering of nectar and pollen increases fruit/ crop production; **medicine**; honey and its by-products have some medicinal values.

Comment:

All pupils were able to describe the economic importance of apiculture in Eswatini. Some of their responses were income generation and medicinal values. Candidates did not mention pollination and job creation.

(b) Describe the procedure for honey extraction from combs.

Expected response:

Put the bucket with the combs in the sun to make the honey flow easily from the combs; sort the combs according to colour; extract the honey using dripping/ heating/ cooking/ squeezing/ spinning; filter the honey with a filter cloth or double strainer to remove impurities like broken honey combs; settle the honey by letting it stand for about 24 hours to remove all air spaces; skim the honey by placing a cling wrap over the surface or by scrapping using a spoon.

Comment:

The performance in this question was poor as a majority of the candidates described how to harvest honeycomb from a beehive instead of honey extraction. Some also described how to extract beeswax from honeycombs.

(c) Discuss causes of absconding in honeybees.

Expected response:

Scarcity of food: leads to bees relocating to where there is food, exposure to too much heat of the sun leads to melting of wax which makes hive to be uncomfortable, when water enters the hive during rainy days, bees leave to a safe place, wrong harvesting techniques like breaking combs, depleting food reserves and use of strong fumes; unsuitable hive: disturbances like ants and other pests.

Comment:

Fewer candidates were able to score points in this question because they discussed the causes of absconding in honeybees.

Question 15

(a) Describe the economic importance of aquaculture in Eswatini.

Expected response:

Nutrition: fish as source of protein which is highly digestible; job opportunities: people are hired to construct ponds/manage the fish / harvest and process the fish; improving the economy: fish industry pay taxes; Aesthetic value; some embark on fish farming for their beauty and graceful movement.

(b) Describe **three** methods of processing fish.

Expected response:

Freezing: refrigeration which preserves fish by locking any water present in the fish into solid form and this prevents bacterial growth.

Smoking: where fish place in close proximity to the fire, the smoke delivers an acidic coating on the fish which prevent oxidation and slows down the growth of bacteria.

Salting: application of salt which inhibits the growth of micro-organisms by drawing microbial cells through osmosis to lengthen the shelf life of the fish.
Canning: subjecting fish to high temperatures to produce commercial sterility resulting in a fully cooked product. Canisters are hermetically sealed and stored in cool place.

Comment:
A majority of the candidates were able to give the correct response, although some gave wrong responses such as: fish is preserved through the practise of polyculture or integrated culture.

(c) Discuss with examples how integrated fish farming can maximise the profitability of a farm.

Expected response:

Reduced production costs as animal waste is used to feed fish; chicken waste is used to feed fish; reduces cost for pond fertilisation; chicken and organic matter into the pond; reduces labour costs for proper chicken waste disposal; waste is channelled to the pond; waste releases nutrients that promote growth of organisms used by fish as feed; doubles income on the same farm using the same resources; waste from the fish pond is used to irrigate crops; plants make use of carbon dioxide released by fish t produce oxygen for fish.

Comment:
A majority of the candidates were able to give the correct response.

EPCSE AGRICULTURE TECHNOLOGY

Paper 5920/03

Practicals

General comments

Candidates that sat for the 2023 Prevocational Certificate of Secondary Education Examination were 102 from 14 centres, which indicated an increase of 28 candidates from the 74 candidates who sat for examination in 2022. Although this was an increase, it was still less by 66 candidates from those who wrote the examination in 2021.

1. Assessment for the 2023 examination was based on the 2021–2023 Examination Syllabus.

2. The overall performance of candidates saw the lowest mark attained being 34% which was a decrease of 21% from 55% which was obtained in 2022. This was still better than the 2021 performance which was 18%. The highest obtained mark was 93% out of 100% which was a drop of 3% from the 2022 performance of 96%. The performance of the 14 centres showed that eight centres performed above the mean, which was 74%, and six centres performed below the mean, and the lowest centre average was 61.5% which was an improvement from the previous year which was 54.8%.

Paper 3 Stages

The 2023 EPCSE (Eswatini Pre-Vocational Certificate of Secondary Education) Agriculture Paper 3 examination had three stages namely: written proposal, product development and evaluation.

Stage 1: Proposal

The proposal should consist of the following:

- Introduction – background and purpose of the project.
- Problem statement – identification of a need or knowledge gap.
- Justification – why the project is a necessity
- Methodology – a clear procedure to be followed to achieve the end product
- Time frame – anticipated date of completion
- References – a list of sources of information

Performance on the proposal stage

A majority of the candidates performed well in this part of the project while a few candidates had some challenges. Six candidates scored lower than 8 marks out 15 yet the lowest mark in 2022 was 8. Two of the candidates scored 15 out of 15 which is a repeat of the previous year performance. It does show

that in most centres candidates are getting proper guidance and this is much appreciated but some centres need to employ more effort in helping candidates to write good proposals

Stage 2: Product Development Stage

The product development stage comprises the following:

2.1. Preparation

A majority of the candidates performed well in this section.

2.2. Implementation

Out of the 102 candidates, there were fifteen candidates who got marks which were below 30 out of a maximum 50 marks. The performance dropped back a bit as there were only two candidates who got marks which were below 30 in 2022.

2.3. End-product realisation (10 marks)

A few candidates had a challenge in this part of the project as they failed to realise the desired end-product.

Stage 3: Project Evaluation Stage (worth 10 marks) Stage 3 comprises the following:

3.1. Product quality and standards; grading and specifications (5 marks)

Fewer candidates scored below 50% in the evaluation stage.

3.2. Project Write-up (5 marks)

In the write-up, firstly the examiner was looking for *presentation* of results, *conclusion* of the project and *challenges*, if any, encountered during the course of the project. The results were captured even if they were written under the project realisation or project evaluation stages. Some candidates had a challenge in presenting the results and conclusions in their project work. They also came up with their own presentation formats which made them lose some marks.

Registers

Registers are very much helpful as the Examiner has to ascertain if learners actually wrote the paper, as well as check candidates' names against their examination numbers. In some registers, there were no page totals, dates, Invigilator's name or signature. In some centres, the registers did not indicate those candidates who were absent. It is a requirement that students who have submitted their write-up must be indicated in the registers. Teachers are once again reminded to complete the registers, sign them, and show the date of completion, as well as the name of the teacher responsible.

Teacher Summary Assessment Sheet

In the summary sheets, the following challenges were noted:

- Two centres presented the supervision scores in decimals, yet the scores should be rounded off to whole numbers
- Centres are encouraged to indicate in the summary sheet if a student is absent or missing. They should thoroughly check if the marks are completed and the totals are correct. No decimals should appear on the summary sheet.

References

This section should be written based on the American Psychology Association Style. Some of the candidates had a poorly presented list of references. References should be in line with the literature cited in the candidate's project work.