

3.8 AGRICULTURE (443)

In the year 2013, K.C.S.E Agriculture Examination consisted of three papers; Paper 1, Paper 2 and Paper 3. The three papers tested the candidates' competence in understanding the agricultural principles, concepts and practices as stipulated in the syllabus. A wide range of knowledge and skills was tested in order to bring out the different abilities of the candidates. The format of the three papers is as follows:

- **Paper 1 (443/1):** This is a theory paper that covers General Agriculture, Crop Production, Agriculture Economics and Soil and Water Conservation. It has three sections, A, B and C, which are marked out of 30, 20 and 40 marks respectively.
- **Paper 2 (443/2):** It is also a theory paper but covers Livestock Production, Farm Power, Farm Machinery, Farm Structures and Farm Tools and Equipment. It has three sections, A, B and C, which are also marked out of 30, 20 and 40 marks respectively.
- **Paper 3 (443/3):** This is a project paper with two project questions, **Project A** and **B**. In 2013, Project A required candidates to **rear chicken** while B was on production of **millet/maize/sorghum**. Candidates selected and carried out only one of the two projects. The paper is scored out of 100 marks.

3.8.1 CANDIDATES' OVERALL PERFORMANCE

The table below shows the general performance of candidates in the year 2013 KCSE Agriculture Examination. Performance in the previous five years has been included for comparison.

Table 15: Candidates overall performance in Agriculture for the last six years

YEAR	PAPER	CANDIDATURE	MAXIMUM MARK	MEAN SCORE	STANDARD DEVIATION
2013	1		90	29.80	13.53
	2		90	31.22	14.30
	Overall	178,771	180	67.19	28.26
2012	1		90	38.87	15.15
	2		90	25.61	12.86
	Overall	178,419	180	69.96	28.85
2011	1		90	26.33	13.73
	2		90	40.30	15.29
	Overall	167,709	180	74.33	29.62
2010	1		90	24.82	11.58
	2		90	36.07	15.07
	Overall	140,237	180	67.96	27.12
2009	1		90	33.54	15.10
	2		90	34.91	13.49
	Overall	137,217	180	77.67	29.12
2008	1		90	32.32	15.11
	2		90	25.59	11.64
	Overall	134,039	180	67.1	27.32

The following observations can be made from the summary in the table:

- (i) Candidates' performance in Agriculture dropped. This is shown by the drop in the overall mean score from **69.96** in 2012 to **67.19** in 2013. **Paper 1 (443/1)** mean score dropped from **38.87** in the year 2012 to **29.80** in 2013. The mean score for **Paper 2 (443/2)** improved from **25.61** in the year 2012 to **31.22** in 2013.
- (ii) The overall standard deviation was **28.26**. The value of the standard deviation indicates that the two papers were able to adequately discriminate candidates of different abilities.
- (iii) The candidature increased from **178,419** in 2012 to **178,771** in 2013. A similar trend was also observed in the years **2012, 2011, 2010, 2009** and **2008**. This is a likely indication of increasing popularity of the subject in schools.

3.8.2 ANALYSIS OF POORLY PERFORMED QUESTIONS

The following is the analysis of the items that were poorly performed by candidates in the year 2013 KCSE Agriculture examination. This report highlights these questions and gives the expected responses. It also offers a general advice to teachers on the possible methodologies to emphasise during instruction.

3.8.3 Agriculture Paper 1 (443/1)

Questions 3

Give **four** reasons why land should be prepared early in readiness for planting. (2 marks)

Weaknesses

- Most candidates gave reasons for early planting.

Expected responses

- Allow time for weeds to dry and decompose;
- Allow for proper soil aeration;
- Allow timely planting / subsequent operations;
- Allow time for soil clods to disintegrate/soften.

Question 5

State **two** conditions that must exist for a market to be purely competitive. (1 mark)

Weaknesses

- Most candidates did not understand the meaning of competitive market.

Expected responses

- Large number of sellers;
- Large number of buyers;
- Homogeneous product;
- Same price for the product;
- Free entry and exit from the market;
- Buyers and sellers have perfect knowledge of market trends.

Question 6

Distinguish between grading and standardization in agricultural marketing. (2 marks)

Weaknesses

- Most candidates did not understand the meaning of standardization. They defined grading but failed to distinguish it from standardization.

Expected responses

Grading - is the sorting of the produce into different lots, each with the same characteristics/market quality while **Standardization** is the establishment of uniformity in the quality and quantity of the product.

Question 8

Distinguish between intensive hedgerow and border planting forms of agroforestry. (2 marks)

Weaknesses

- Most candidates did not understand the meaning of hedgerow planting. They defined border planting but failed to distinguish it from hedgerow planting.

Expected responses

Intensive hedgerow:- trees or shrubs are planted between rows of crops.

Border planting:- trees or shrubs are planted on the borders of the farm.

Question 15

State **four** characteristics of a good vegetable seedling. (2 marks)

Weaknesses

Most of the candidates stated characteristics of a good vegetable plant instead of vegetable seedling.

Expected responses

- Free from disease/pest/healthy;
- Vigorous growing;
- Free from physical deformities;
- High yielding;
- Correct stage of growth/height 10 - 15 tall/4 - 6 true leaves.

Question 20

The following is a list of plant nutrients; Copper, Calcium, Nitrogen, Molybdenum, Zinc, Phosphorus, Carbon, Sulphur, Iron and Magnesium.

Which of the above plant nutrients are:

- (a) macro-nutrients (1 mark)
- (b) micro-nutrients (1 mark)
- (c) fertilizer elements (1 mark)
- (d) liming elements. (1 mark)

Weaknesses

- ☐ Most candidates were not able to classify plant nutrients despite being provided with the names of the nutrients.

Expected responses

- (a) Macro-nutrients:-
 - Calcium;
 - Nitrogen;
 - Phosphorous;
 - Carbon;
 - Sulphur;
 - Magnesium.
- (b) Micro-nutrients:-
 - Copper;
 - Molybdenum;
 - Zinc;
 - Iron.
- (c) Fertilizer elements:- Nitrogen, Phosphorous & Potassium.
- (d) Liming elements:- Calcium; Magnesium and Sulphur.

3.8.4 Agriculture Paper 2 (443/2)

Question 19

Below are photographs showing parts of a ruminant stomach. Study them and answer the questions that follow.



A



C



B



D

- (a) Identify the parts labelled A and B (2 marks)

A.....

B.....

- (b) State **one** function of the part labelled

A..... (1 mark)

C..... (1 mark)

- (c) Name **one** enzyme that is produced in the part labelled D. (1 mark)

Weaknesses

- ☐ Most candidates were not able to identify and give the functions of the four chambers of a ruminant stomach. This could be an indication that the instruction does not embrace practical aspects. The syllabus requires the learners to describe digestion and digestive systems of cattle.

Expected responses

- (a) A - Reticulum/Honey comb.
B - Rumen/pauch.

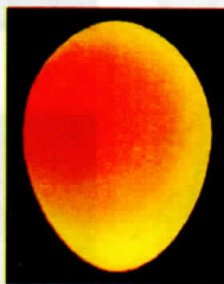
- (b) A: - Separating fine and coarse food materials.
- Retaining indigestible food materials.

- C: - Absorption of water.
- Grinding and sieving food particles
- Temporary food storage

- (c) Pepsin/Renin

Question 21

Below is a photograph showing an egg being candled. Study it and answer the questions that follow.



- (a) Why is candling important in poultry farming? (1 mark)
- (b) What changes will be observed on the same egg if it was candled on the 18th day of incubation? (2 marks)

Weaknesses

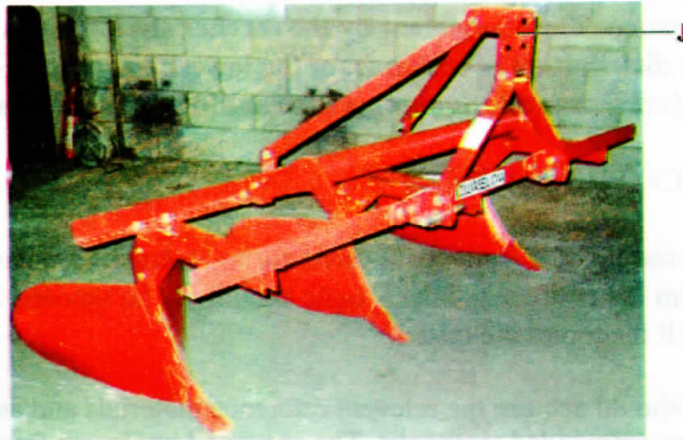
- Most candidates understood the reasons for egg candling but could not give the changes an egg undergoes during incubation. The syllabus requires learners to select eggs for incubation and manage an incubator. During the management of the incubator, candling is one of the practices.

Expected responses

- (a)
- Check egg abnormalities
 - Monitor chick development during incubation
 - Check whether the egg is fertile
- (b)
- A large dark section of developing chick.
 - A small clear section of air space.

Question 23

Below is a diagram illustrating a farm implement. Study it and answer the questions that follow.



- (a) Identify the implement illustrated above. (1 mark)
- (b) State the use of the:
- (i) implement on the farm; (1 mark)
- (ii) part of the implement labelled J. (1 mark)

Weaknesses

- Most candidates were not able to identify the farm implement. They confused it with a mould board plough.

Expected responses

- (a) A Ridger/mould board ridger.
- (b) (i) To make ridges/furrows
- (ii)
 - used to attach the implement to a tractor.
 - Adjusting the depth of operation.

3.8.5 Agriculture Paper 3 (443/3 – PROJECT)

The agriculture project paper administered to provide an opportunity for the candidates to show and put into practice, the psychomotor skills acquired during the four years period in secondary school. Candidates are tested in practical skills in the growing of a selected crop from land preparation to harvesting, rearing selected livestock to maturity or constructing a farm structure such as beehive, feed trough, rabbit hutch, compost pit/heap, among others.

The instructions are taken to schools, which then provide the required inputs for candidates to carry out the project work independently. The project takes eight months, from February to September of the given year.

In the year 2013, candidates chose between chicken rearing and production of millet/maize/sorghum. The agriculture teacher's duty was to objectively assess and evaluate each candidate's work at all the stages of project implementation. **The assessment by the teacher should be on the basis of the class such that there is an even distribution of scores from the lowest, average and finally the highest performers. Inflating project scores disadvantages the candidates when standardisation is done.**

3.8.6 GENERAL ADVICE TO TEACHERS

- (i) The whole syllabus should be effectively covered during instruction because examination items will be sampled from the entire syllabus. A topic should not be ignored because it was recently or is never tested. All the topics are tested.
- (ii) The teacher/school should acquire the relevant reference materials and assist candidates to obtain and use the recommended textbooks. The approved books are found in the orange book published by the Kenya Institute of Curriculum Development.
- (iii) The use of textbooks by teachers should always be guided by the syllabus. The specific objectives stipulated in the syllabus should be correctly interpreted to ensure the topics in question are taught at the appropriate breath and depth.
- (iv) A variety of teaching methods and resources should be utilised by teachers to ensure that the content is effectively delivered during instruction. Resource persons/guest speakers and field visits should be arranged and used in areas where the teacher and the school lack the resources to teach the topic/lesson effectively. Agriculture is a science and should be treated accordingly during instruction. The teaching and learning process should go beyond the mere statement of facts. The candidates should be able to explain and apply the knowledge acquired during instruction. Many candidates had problems in answering questions of high cognitive demand.
- (v) All the suggested practical activities in the syllabus should be carried out to prepare candidates adequately for questions that require application of psychomotor skills acquired during instruction.