

AGRICULTURE

Paper 0600/11
Theory

Key messages

Candidates should ensure they read each question part with care and note the command word used.

When using diagrams as part of a response, candidates should ensure that these are sufficiently clear. Candidates may use a pencil for diagrams to aid clarity.

General comments

Candidates gave some strong responses to the last section of the question paper. Stronger candidates frequently provided detailed, carefully organised and well-reasoned responses. Some weaker candidates had difficulty in applying their knowledge to scenarios or situations. Weaker candidates also sometimes resorted to making statements without further development when a greater level of response was requested.

Comments on specific questions

Section A

Question 1

- (a) Many candidates applied their knowledge well to this question.
- (b) (i) Stronger candidates showed a good awareness of potential advantages of genetically modified (GM) crops. Some weaker candidates referred to what seemed to be disadvantages instead.
 - (ii) Most candidates appeared to have good knowledge of the ways that growing GM crops could reduce farm profits. Stronger candidates were able to apply this knowledge well to make valid explanations. Some weaker responses were left too vague for credit.

Question 2

- (a) This question was generally answered well. Most candidates labelled topsoil on the diagram. Weaker candidates sometimes confused the layers.
- (b) Many candidates suggested and explained two valid reasons why a shallow-rooted plant may not grow well in sandy soil. Some weaker candidates did not develop their response sufficiently for explanation to be credited.
- (c) Some good knowledge was shown here with many candidates seeming to demonstrate an excellent understanding of practical agriculture and suitable methods to increase the yield of a shallow-rooted crop in this situation.

Question 3

- (a) (i) Stronger candidates usually demonstrated a good understanding of practical agriculture here. Many others applied their knowledge to at least one aspect of the question.
 - (ii) This question was generally answered well by stronger candidates. Some weaker candidates identified appropriate environmental conditions but did not suggest how these could be controlled.

- (b) This question was answered well by most candidates. Some weaker candidates did not focus their response on the question asked.
- (c) (i) Many candidates calculated this accurately. Some weaker candidates did not interpret the table correctly. Some candidates did not use the working space available, which may have made the question more challenging to answer. Generally, candidates who carefully showed their working tended to perform well.
- (ii) This was frequently well answered with a number of candidates showing application of knowledge of appropriate factors.

Question 4

- (a) (i) This was very well answered with many candidates scoring full credit. Some weaker candidates made their responses too unclear for credit to be awarded.
- (ii) This was frequently well answered with many candidates scoring full credit.
- (b) This question was generally well answered. Many candidates demonstrated an understanding of the other ways in which legumes can help to maintain soils. Some candidates could only repeat the role of legumes in the nitrogen cycle.

Question 5

- (a) There were many very good responses. Some weaker candidates showed confusion between sexual and asexual features.
- (b) (i) Many candidates stated what is meant by pollination in detail. Some weaker candidates did not refer to any flower parts.
- (ii) There were many excellent explanations of the features of an insect-pollinated flower. Some candidates focused on features of a wind-pollinated flower.
- (c) This question was generally answered well by most candidates.

Question 6

- (a) Many candidates stated two differences between a ruminant digestive system and a non-ruminant digestive system. Some weaker candidates gave responses which confused the two systems.
- (b) Most candidates answered this question well. Some weaker candidates did not focus on appropriate main functions.

Question 7

- (a) Stronger candidates usually described the meaning of both a maintenance and production ration clearly.
- (b) (i) Generally, weaker candidates were not able to soundly apply knowledge of ways to reduce the spread of infectious disease.
- (ii) There were many excellent explanations of how parasites could affect a farming business. These often showed excellent application of knowledge.

Question 8

- (a) Generally, weaker candidates did not seem to have knowledge of the meaning of carrying capacity.
- (b) There were many excellent suggestions made here in stronger responses, which may have been drawing on practical experience. The question required an application of knowledge and generally stronger candidates identified the importance of all three tasks while weaker candidates could only achieve partial credit.

- (c) (i) Stronger candidates usually correctly identified the trend. Weaker candidates sometimes did not refer to the axis labels sufficiently clearly.
- (ii) Most candidates gave a good, well-applied response to this question. Weaker candidates sometimes resorted to repetition for a second point.
- (iii) This question was answered very well by many candidates who suggested a range of appropriate variables which if controlled would support a fair investigation.

Question 9

- (a) Many candidates correctly identified these genotypes.
- (b) This genetics question was answered well by many candidates who usually identified the offspring genotypes and the ratio arising from the cross correctly. Most candidates gave a good, well-applied response to the question. Weaker candidates sometimes made some inaccurate deductions when working out the resulting offspring ratio.
- (c) (i) Stronger candidates answered this question well. Some weaker candidates incorrectly linked growing cereal plants with shorter stems to some inappropriate or vague reasons.
- (ii) The question was well answered by most candidates who frequently suggested an appropriate way to produce a cereal variety with shorter stems.

Section B

Question 10

- (a) Many candidates made appropriate points, seemingly applying knowledge from a range of practical farming situations to describe the preparation of soil. Some weaker candidates focused more on activities not related to soil preparation.
- (b) Many candidates were able to identify a mechanised tool and a hand tool for soil preparation. Some candidates then described appropriate maintenance tasks. Weaker candidates generally did not focus their responses on maintenance. Stronger candidates could usually relate maintenance tasks to stony ground and wet soils.
- (c) Many candidates were able to suggest a range of appropriate considerations in relation to a farmer replacing their ox with a tractor.

Question 11

- (a) This question was well answered. Many candidates were able to name a boring pest and describe its effects on a crop.
- (b) The responses to this question were usually well-detailed, with stronger candidates often effectively describing a range of organic methods to control pests. Some weaker candidates tended to list technique names only.
- (c) Most candidates suggested at least some ways in which the incorrect application of farm chemicals could damage the environment. There was generally a lack of explanation in the responses of some weaker candidates. Some responses of weaker candidates were left too vague for marks to be awarded.

Question 12

- (a) This question was generally answered very well with good application of knowledge shown by many candidates.
- (b) Stronger candidates could usually describe well how selective breeding can improve the quality of farm livestock.

- (c) Many candidates were able to explain several disadvantages of artificial insemination. Stronger candidates usually gave a breadth of responses. Weaker candidates sometimes gave inappropriate disadvantages.

Question 13

- (a) Many candidates gave strong responses which outlined the process of photosynthesis clearly.
- (b) Stronger candidates usually described the processes used to move materials through a plant well, with careful application of terminology being a feature of the most successful answers. Weaker candidates may need to be advised to use terminology carefully. Some weaker candidates referred to other movements of materials instead.
- (c) Most candidates suggested a range of possible problems caused by the overuse of fertilisers. The strongest responses referred to issues in relation to a range of areas, such as plants and soil.

Question 14

- (a) Stronger candidates often described two ways in which large volumes of water can be stored on a farm well. Weaker candidates sometimes only listed items.
- (b) The strongest candidates were able to discuss water requirements for a range of different activities on a mixed farm and effectively related these needs to a relevant water source and often quality.
- (c) Most candidates described two relevant animal-health problems. Many candidates could include at least one relevant way in which a contaminated water supply could be treated to avoid these animal-health problems. The strongest candidates were able to make clear links and strong explanations.

AGRICULTURE

Paper 0600/12
Theory

There were too few candidates for a meaningful report to be produced.

AGRICULTURE

Paper 0600/02
Coursework

Key messages

It is recommended that the coursework be incorporated into the teaching scheme of work. Centres should consider the local environmental factors when planning the delivery of the coursework. This approach enables the practical work to enhance the understanding of agriculture in practice and incorporates the related science and economic awareness.

Coursework activities should be considered carefully to ensure that candidates can show what they know and can do.

General comments

The majority of centres submitted candidates work promptly and organised candidates' evidence well. Work was of a good standard and presented in a range of interesting and creative formats.

Photographic and video evidence was often valuable in supporting the practical exercises and in the production of candidates' investigations. Evidence must be supplied to support marks awarded. Evidence should be related to individual candidates and should lead to a discussion of how any difficulties or problems were managed or adapted to allow a positive outcome wherever possible. Photographic evidence was often annotated or referred to in text to explain tasks being demonstrated. Comments related to factors encountered were also often seen. At some centres, video evidence could have included more candidate commentaries to evidence knowledge of tasks undertaken.

Use of photographic and video evidence was sometimes excellent and incorporated live audio discussion and/or high-quality annotation of photographic evidence of work being performed was used. The strongest examples included constructive, critical reflections of the tasks being performed. Stronger candidates related their experience to agricultural science. Some centres carried out some of the practical exercises through the investigation focus. If possible, it is advised candidates should be encouraged to take part in many different varieties of practical exercise.

In a few cases, insufficient depth of work led to the need for some large adjustments. The majority of adjustments made were small. This was due to trends at individual centres, the reasons for which are detailed in individual centre reports.

Comments on specific areas

Practical Exercises

Many centres carried out a wide range of practical exercises. When considering practical exercises, it is important that stronger candidates can access an appropriate level of demand, and this should be considered in selection. This provides opportunity for candidates to think critically about the task they are undertaking and suggest improvements to their methods.

Assessors should show how marks have been awarded, for example, they could annotate candidates' work to identify achievement. This could be added to a candidate record card or directly onto candidates' work.

Practical exercise evidence relating to crop production often involved plot preparation, planting, weeding, and harvesting. Some centres included skills such as soil testing for pH or soil composition.

When carrying out a skill/task in a practical exercise, it is important that high marks are only awarded for work where candidates use tools and equipment fully correctly and they demonstrate that they are using an awareness of good health and safety practices. A few videos and photographs showed multiple candidates using tools and carrying out tasks. When submitting evidence in this format, the materials should be individual.

Some centres awarded marks very generously. Centres should use the marking criteria carefully and ensure they differentiate performance, only awarding full marks for excellent performances. Effective description and annotation was carried out this year by some centres.

Practical Investigation

The range and diversity of topics investigated was generally very good and the quality of presentation often enabled candidates to demonstrate their creativity. Work of a higher standard was often detailed and fully discussed and explained. Stronger candidates incorporated research into their plans, cross-referencing this with their findings and then made full use of the data collected to produce well-reasoned deductions based on the relevant science and agricultural practice. Referencing of research should identify the book and author or full web address and date accessed.

The selection of relevant questions (hypothesis) for the investigation

The majority of candidates produced a hypothesis and some also included an alternative hypothesis. Candidates should relate their hypothesis to their own research and evidence it in a way which demonstrates their understanding of the investigation. Where candidates develop the same hypothesis, this should be annotated to show whether it is original or devised as a group, and marks awarded accordingly.

Centres should annotate candidates' work to indicate the amount of support given to candidates in developing their hypothesis to demonstrate its originality. Only fully independent selection and the formation of an appropriately challenging hypothesis should be awarded full credit.

The planning of the investigation and the principles on which it is based

Methods were generally well researched, with a good proportion of candidates incorporating a good range of background information. Where candidates accessed additional sources, most of these were included in a bibliography or next to the information.

Equipment and methods stated were usually clear and indicated an understanding of the processes needed to prepare ground for planting along with test factors that affect the growth of a crop or animal. The time required to carry out methods was omitted in several cases and this needs to be considered when planning some investigations.

The strongest candidates referred to their background research and their hypothesis and used this to develop a suitable plan for carrying out their investigation. Where amendments to the plan were required, these candidates explained and justified the modifications to the plan in appropriate detail.

The handling of evidence

Many candidates collected a good range of data to support their findings. Many candidates often included measurements of growth of a crop or animal over a period of several weeks. This enables a trend to be seen in data. In some cases, the data collected was quite limited and only just sufficient to produce a basic analysis of results. If candidates are to produce meaningful data, they need to have taken a comprehensive range of results throughout the investigation. Simply producing a bar chart of final crop yield is unlikely to be sufficient. Stronger candidates usually investigated different factors on a crop or livestock. These candidates could link their processed data from a number of sources to identify patterns or trends. This often included additional data, such as volume of water used to water the plants each day/week to consider control variables that may affect the validity of their investigations.

Presentation of the data was generally good. However, this was sometimes presented in a simplistic way with little or no explanation. In many cases, clear headings on tables and axis descriptions or units on graphs were not used well. Stronger candidates usually incorporated more than one method of analysing their data, showing how it affected the outcome of their investigation. These candidates provided tables and charts which were usually clearly labelled using appropriate units with a clear, sufficiently detailed heading. Useful

graphs were annotated to ensure the reader could understand what was being shown. Stronger candidates often identified any anomalies clearly and referenced them for further discussion.

Results of investigations need to be recorded in detail and with appropriate precision. Candidates needed to indicate any specific procedures which were used to collect accurate data, taking care to use appropriate and reliable sample sizes.

Stronger candidates discussed local modifications to procedures which might be needed to cope with their local environmental situations, such as water shortages or erosion of soil, and clearly identified the precautions required to ensure results were as accurate as possible.

The ability to make deductions from the evidence or data acquired

In some cases, this was carried out well, focusing on the trends in data acquired and also the scientific reasons for why the trends may have been evident. Stronger candidates also recommended further investigative procedures to check and extend the investigation to ensure repeatability.

Generally, this was an area which would have benefited from more focus, as some candidates only focused on the initial trend and were unable to produce valid deductions from their own evidence. Candidates need to be encouraged to do more than simply state the results they have obtained. The strongest candidates fully explained the reason(s) for their results and their conclusions related to the data and outcomes of their investigation. Weaker candidates sometimes needed to draw conclusions and explain and discuss their results and outcomes in more detail, taking care to use background research and to link this to their own findings.

The ability to recognise limitations of the investigation

Most candidates addressed this area in some way and attempted to demonstrate a clear understanding of this skill by explaining the limitations of their investigations. Many candidates stated limitations only but the strongest candidates took care to fully explain how future amendments or alterations to their procedure could possibly overcome the problems which they had encountered, incorporating scientific agricultural understanding as to how their investigation was affected. However, some candidates made general statements which were not explained sufficiently to meet the marking criteria.

Description of investigation, presentation, layout, and originality

In the strongest submissions, candidates used appropriate sub-headings and made full use of diagrams and charts. The investigations were fully explained, annotated, referenced and linked to the discussions and outcomes obtained in the production of deductions and conclusions.

Annotated photographs greatly improved many reports making it easier to see and understand the work undertaken and these showed the outcomes which candidates had achieved. This year a lot of candidates' work was supported with annotated photographs which were clearly identified using headings and were referred to, discussed and explained in detail. Where group photographs are used candidates should identify themselves and say how the photo is relevant to their investigation.