AGRICULTURE

Paper 0600/11
Theory

Key messages

Candidates should be reminded to check carefully that they have answered two questions from the last section of the question paper.

Candidates should recognise the importance of the command words for each question. Some weaker candidates tend to state without further development, regardless of the command word.

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

General comments

Candidates gave some good responses to the last section in particular. Stronger candidates frequently provided detailed, carefully organised and well-reasoned responses. Some weaker candidates had difficulty in applying their knowledge to scenarios or situations.

Comments on specific questions

Section A

Question 1

(a) (i) Many candidates gave the correct response to this question.

(ii) Many candidates gained full credit for this question. Good knowledge of the range of possible damage caused by biting and chewing pests was shown by many candidates.

(b) (i) Many candidates gave the correct response to this question.

(ii) Stronger candidates appeared to have good awareness of the possible benefits of this example of biological control and were able to apply knowledge well. Weaker responses were generally more limited or made overstatements.

(iii) Stronger candidates could generally explain one disadvantage of this control method. Some of these candidates seemed to draw on knowledge of practical agriculture. Weaker candidates often did not explain the disadvantage they identified.

Question 2

(a) (i) Stronger candidates usually gave a correct answer. Weaker candidates sometimes suggested a single allele.

(ii) This question was generally answered well.

(iii) This genetics question was answered well by most candidates, who usually identified the offspring genotypes arising from the cross correctly.

(b) Many candidates suggested and explained two valid disadvantages of an animal having horns. Some weaker candidates gave responses that would apply to animals without horns. Other weaker candidates did not develop their explanation sufficiently.

Question 3

(a) Some detailed knowledge was shown here with many candidates demonstrating an excellent understanding of the importance of farm records. Stronger candidates demonstrated a very good understanding of practical agriculture across the requirements of this question. Many others applied their knowledge well to at least some aspects.

(b) This question was generally answered well by most candidates. Some weaker candidates suggested incomplete or inappropriate actions.

Question 4

(a) This was frequently very well answered with many candidates scoring full credit and showing a breadth of knowledge.

(b) This question was well answered generally. Many candidates demonstrated a good understanding of the way in which systemic pesticides control insect pests in crops.

Question 5

(a) There were some good answers from many candidates. Some descriptions of zero grazing were too vague for credit. Some candidates described an extensive grazing system instead.

(b) Many candidates suggested a variety of valid reasons for the use of a zero-grazing system. Some weaker candidates continued to show confusion about the meaning of zero grazing, confusing it perhaps with other terms.

(c) (i) Many candidates drew sufficiently detailed, well-labelled diagrams and clearly demonstrated their knowledge of rotational grazing systems. Weaker candidates sometimes did not illustrate or label distinct grazing areas, animal movement between these or other aspects.

(ii) Stronger candidates were able to make links to an appropriate explanation. Stronger candidates could usually explain well using precise terminology.

Question 6

(a) Many candidates correctly suggested different ways to prevent soil erosion at each location and described how these methods work. Some weaker candidates did not include the description of how this works.

(b) Most candidates answered this question well. Some weaker candidates confused the properties of clay and sandy soil.

Question 7

(a) Many candidates gave good responses describing the process of photosynthesis. Candidates should be advised to use terminology carefully as some weaker answers were overgeneralised or technically incorrect and so could not be awarded credit.

(b) (i) Some candidates referred to changes to the soil in their answers. Stronger responses were typified by clear descriptions of ways in which conditions could be controlled to increase yields.

(ii) This question was answered very well by many candidates. Generally, weaker candidates did not seem to have knowledge of the processes involved.

Question 8

(a) There were many excellent suggestions made here. Some stronger responses may have been drawing on practical experience. Some weaker candidates did not seem to use the photograph to guide their responses well. Stronger candidates applied this well to make suitable suggestions.

(b) This question required an application of knowledge and generally only the stronger candidates gained full credit. Stronger candidates identified suitable environmental benefits and problems.

Question 9

(a) (i) Many candidates calculated this well. Some weaker candidates did not interpret the table well.

(ii) Some candidates did not use the working space, which may have made the question more challenging to answer. Generally, candidates who carefully showed their working tended to perform well.

(b) Most candidates gave a good, well-applied response to this question. Weaker candidates made some inaccurate statements on occasion.

Section B

Question 10

(a) Some weaker candidates gave responses which were too vague for credit. Many other candidates generally made appropriate suggestions applying knowledge from a range of practical farming situations.

(b) Some weaker candidates did not focus their responses on factors relating to the use of ditches to drain grazing land. Stronger candidates could usually focus their response well.

(c) There was generally a lack of explanation in the responses of some weaker candidates.

Question 11

(a) Many candidates were able to describe ways to clear bush to grow a crop and stronger candidates appreciated the problems that could result. Some weaker candidates focused more on the next steps in the cultivation process.

(b) (i) Stronger candidates identified a suitable fungal disease and described a range of possible effects. Weaker candidates sometimes stated other types of disease.

(ii) The responses to this question were usually well-detailed, with stronger candidates often effectively explaining how the level of fungal disease in crops could be reduced. Weaker candidates tended to offer little explanation of their suggested steps.

Question 12

(a) This question was generally answered very well with good knowledge shown by many candidates.

(b) Stronger candidates knew soil pH testing methods well and many explained how the results of this could be used. Weaker candidates sometimes confused the scientific terminology involved.

(c) Many candidates were able to explain several reasons why loam soils are considered suitable for crop growth. Stronger candidates gave a good breadth of responses.

Question 13

(a) Candidates generally described a good range of ways in which high temperatures can affect crop growth. Some weaker candidates focused more on the effects of other factors.

(b) Stronger candidates usually described the methods used well, with careful application of terminology being a feature of the most successful answers.

(c) Some candidates concentrated on a single stage of the growing cycle only, such as germination or maturity. The strongest responses explained the different water requirements at more than one crop growth stage.

Question 14

(a) Stronger candidates described the meaning of both a maintenance and production ration clearly. Weaker candidates could generally only describe a maintenance ration.

(b) The strongest candidates were able to explain the features of good building design in relation to the provision of adequate food and water. Weaker candidates sometimes listed the features of building design more generally without good application to the question.

(c) Only the stronger candidates tended to describe relevant methods in which a consistent, balanced ration could be provided. Some candidates restated elements from their previous answer.

AGRICULTURE

Paper 0600/12
Theory

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

AGRICULTURE

Paper 0600/02
Coursework

Key messages

The coursework should be incorporated into the teaching scheme of work. Centres should consider the local environmental factors and seasons 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.

Photographic and video evidence enhances learning and is valuable in supporting the practical exercises and in the production of candidates' investigations. Evidence must be supplied to support marks awarded. Evidence must be unique 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 could be annotated by candidates to explain tasks being demonstrated and should incorporate comments related to factors encountered. Video evidence could include candidate commentaries to evidence knowledge of tasks undertaken.

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. Some centres organise each candidate's work together rather than submitting batches of practical exercises and practical investigations, which aids moderation.

Many centres made full use of photographic and video evidence and incorporated live audio discussion and/or high-quality annotation of photographic evidence of work being performed. The strongest examples included constructive, critical reflections of the tasks being performed. Stronger candidates related their experience to agricultural science. Some centres carried out practical exercises through the investigation focus. This is acceptable for three of the exercises, but the fourth should be from a different area of study. Candidates should be encouraged to take part in many different varieties of practical exercise during the course of study. Few centres offered livestock exercises this year, possibly due to the time and management commitment involved in livestock investigations.

From some centres there was insufficient evidence submission leading to large adjustments. Minor adjustments were made in other cases due to trends at individual centres, the reasons for which are detailed in individual centre reports.

Comments on specific areas

Practical Exercises

Most centres carried out a wide range of practical exercises with many offering a range which was clearly linked to the delivery of the syllabus theory content. When considering practical exercises, it is important for stronger candidates to access an appropriate level of demand and this should be considered in selection. This provides opportunity for these candidates to think critically about the task they are undertaking and suggest improvements to their methods.

It is helpful if centres annotate candidates' work to identify achievement when candidates carry out a task. This could be added to a candidate record card or directly onto candidates' work.

Practical exercise evidence mainly related to crop production involved in individual investigations including plot preparation, planting, weeding, and harvesting. Some centres included skills such as soil testing for pH or soil composition, both of which are key skills supporting theory work and help with many investigation topics, in particular the cultivation-based investigations. Analysis of these supplementary tasks enabled the agricultural science behind any findings to be discussed.

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. 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, and candidates can annotate their photographs or make commentaries on videos.

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, annotation and reflection of exercises was carried out this year by many centres.

Practical Investigation

The range and diversity of topics investigated was generally very good and the quality of presentation often enabled candidates to showcase 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.

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 strongest candidates collected a good range of relevant background information and used it when preparing their plans.

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

Methods were generally well researched with a 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 and 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 needed to be considered when planning the investigation.

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. A good range 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 insufficient to access higher marks. Stronger candidates 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 included additional data such as volume of water used to water the plants each day/week to consider controlling variables that may affect the validity of their investigations. Acknowledgement of the agricultural science contributing to phenomena was then used in addition to stating basic facts.

Presentation of the data was generally good but many were presented in a simplistic way with little or no explanation. In many cases headings on tables and axis descriptions and units on graphs were not used. 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. Graphs were annotated to ensure the reader could understand what was being shown, for example the rate of crop growth and gradient of graph lines. These candidates 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 many 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 or describe 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 needed to draw conclusions and explain and discuss their results and outcomes in detail, taking care to use background research and to link this to their own findings.

Many candidates saw experimental error or natural events beyond their control as spoiling or limiting their ability to draw conclusions and to evaluate their results appropriately. Candidates need to be encouraged to show and explain the importance of events beyond their control, and to link these to the conclusions that can be drawn from such events when addressing the final outcomes. It is important that candidates identify and explain how errors may have occurred and how these might impact on their ability to draw a firm conclusion.

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. The importance of this skill area needs to be explained to candidates before attempting to deliver the coursework.

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.

Most centres marked this section accurately and in general, the investigations were well presented.