AGRICULTURE

Paper 0600/11
Theory

Key messages

Weaker candidates should be reminded to check carefully that they have answered two full questions in the last section.

Candidates should recognise the importance of the command words for each question. An 'explain' question will generally require a much fuller answer than one that uses a lower-level command word.

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

General comments

In data response questions in the first section, those candidates that showed their working tended to do better than those who did not. Candidates mostly gave good responses to the last section. Stronger candidates frequently provided detailed, carefully organised and well-reasoned responses. However, some weaker candidates had difficulty in applying their knowledge to scenarios.

Comments on specific questions

Section A

Question 1

(a) Many candidates gained full credit for this question. Reasons for monoculture seemed least well understood. Good knowledge of legumes was shown by many candidates.

(b) Stronger candidates appeared to have experience of the process of taking a cutting and could apply this. Weaker candidates' responses were generally quite limited.

(c) (i) Stronger candidates could generally explain two suitable reasons, showing good use of the information provided.

(ii) Most candidates gave a correct response to this question.

Question 2

(a) There were some very detailed answers with stronger candidates covering a broad range of ways farmers could reduce soil erosion and often achieving full credit.

(b) (i) Stronger candidates gave the correct answer. Weaker candidates seemed unable to use the scale to differentiate between the soil particles listed in the table.

(ii) Some weaker candidates gave the properties of soil rather than components. Many candidates however answered this question well.

(c) This question was generally answered well. Most candidates were sufficiently clear when drawing lines.

Question 3

(a) (i) Some detailed knowledge was shown here with some candidates demonstrating an excellent understanding of the role of a leaf.

(ii) A small number of candidates gave an incorrect gas as a response here. Many others applied their knowledge well.

(b) This question was generally answered well by most candidates.

(c) Stronger candidates could describe multiple ways. Some weaker candidates gave responses that would provide high temperatures instead.

(d) Many candidates selected the correct statement about pollination.

Question 4

(a) (i) Most candidates identified the link between increasing distance and increasing yield. Some candidates did not comment that beyond a certain distance yield did not increase further. Weaker candidates confused the two axes.

(ii) This was frequently very well answered with many candidates scoring full credit.

(b) (i) Stronger candidates generally explained well how roots or seeds could lead to weed propagation.

(ii) Some weaker candidates did not focus their responses on the importance of control before flowering. Many candidates could do this well.

(iii) This question was well answered with a wide range of appropriate knowledge applied in stronger responses.

Question 5

(a) Some descriptions for crop rotation from the weaker candidates were left too vague for credit. The way systemic insecticides work was often the best understood of the three methods.

(b) There were some good answers from many candidates. Some candidates confused this topic with other areas of the syllabus. Some weaker candidates gave repeated answers rather than using a full range of actions to demonstrate their knowledge.

(c) Most candidates identified the correct answer.

Question 6

(a) Many candidates correctly identified the position of the rumen with most correctly labelling all four compartments.

(b) There were some weaker responses describing the process of digestion generally without reference to the role of enzymes. Candidates should be advised to use terminology carefully as some weaker answers were over generalised or technically incorrect and could not be awarded credit.

(c) Most candidates answered this question well.

Question 7

(a) Candidates should always be encouraged to use units when answering mathematical questions as per the front cover instructions. Most used the table well and stronger candidates tended to show their working.

(b) Some candidates did not note the command word and so left their answer underdeveloped. Stronger responses were typified by clear explanations. Some very weak candidates confused colostrum with other syllabus terms or confused their explanations.

Question 8

(a) There were many excellent suggestions including economic and practical considerations. Some stronger responses may have been drawing on practical experience.

(b) (i) This genetics question was answered well by most candidates.

(ii) This question required an application of knowledge and fewer candidates gained full credit than for the first part. Some candidates showed a cross but did not clearly state the genotype of the bull.

(c) (i) This question was answered very well. Generally, only the weaker candidates could not give the correct term.

(ii) An unqualified overstatement by some candidates was to say that artificial insemination does not need a bull. Many other candidates gave appropriate responses.

Question 9

(a) Some weaker candidates did not see to use the photograph to guide their responses well. Stronger candidates applied this well to make suitable suggestions.

(b) (i) This was a more challenging example of an applied question. Most candidates who used the space provided to draw out a representation of the field and post spacing correctly answered the question. Those who did not use this space generally did not determine correctly.

(ii) While many found this a simpler calculation, weaker candidates could generally not apply their knowledge well. Some candidates did not use the working space, which may have helped.

(c) (i) This question was generally answered well.

(ii) Most candidates could give a suitable reason why this is important.

(iii) Some weaker candidates did not follow the requirement of these questions to give different reasons for each part or had to resort to repetition for this question.

Section B

Question 10

(a) Some weaker candidates gave responses which were left very vague. Many candidates could do better and made appropriate suggestions applying knowledge from a range of areas.

(b) Most candidates gave an excellent response to this question.

(c) There was a lack of explanation in some weaker responses to this question.

Question 11

(a) Many candidates were able to describe methods to improve the pasture. Some did not cover the removal of the existing rough pasture elements.

(b) The stronger responses explained well how the increase occurs. Weaker candidates did not link their, often limited, responses well to the increase.

(c) The responses to this question were usually sufficiently detailed, with stronger candidates using good descriptions of rotational grazing to support their answers.

Question 12

(a) Some candidates directed their answers towards the environment without reference to the range of building materials that could be used to construct the animal house. Others applied knowledge well.

(b) This question was generally answered well with good knowledge shown by stronger candidates.

(c) Many candidates were able to give details identifying both the treatment processes and how they worked.

Question 13

(a) Candidates generally demonstrated a good range of factors to be considered. Stronger responses tended to include practical as well as economic factors.

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

(c) Some candidates concentrated on the impact of pests and diseases. Some responses recognised other issues, such as the crop becoming less attractive. Stronger candidates tended to keep their answers focussed on ways this impacted on profits.

Question 14

(a) Stronger candidates clearly linked the impact of specific examples of dietary factors with their direct impact on health. Weaker candidates could generally only give one example.

(b) Applying the many possible records kept by farmers to ill-health was generally only successful for the stronger candidates.

(c) Many candidates could identify some other records, such as those kept for production. Stronger candidates generally went on to explain well the link between these records and profit.

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 can incorporate the related science and economic awareness.

Photographic and video evidence usually enhances learning and is valuable in supporting the practical exercises and in the production of candidates' investigations. 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 good outcome wherever possible. Photographic evidence can be annotated by candidates to explain tasks being demonstrated and should incorporate comments related to factors encountered. Video evidence can include candidate commentaries to evidence knowledge of tasks undertaken.

General comments

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

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 the relevant science and the recognised agricultural practice.

Comments on specific marking criteria

Practical exercises

Centres carried out a wide range of practical exercises with many offering a range which was clearly linked to the delivery of the theory content. Most centres provided evidence of the practical skills involved in crop production relating to individual investigations including plot preparation, planting, weeding, and harvesting. Some centres included practical skills such as soil testing for pH or soil composition, which can support theory work and help with many investigation topics, in particular these cultivation-based investigations.

When selecting practical exercises, it is important that the exercises chosen allow stronger candidates to access an appropriate level of demand. This provides an excellent opportunity for these candidates to think critically about the task they are undertaking and make suggestions for how they can improve the methods. There were some very good video clips of candidates working and achieving excellent outcomes from their efforts.

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

When carrying out a skill/task in a practical exercise, it is important that high marks are only awarded for work where the candidate uses tools and equipment fully correctly and demonstrates 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 must be individual, and candidates should annotate their photographs or make commentaries on videos.

Some candidates used a format such as PowerPoint to present their work. Video links should not be embedded unless the linked file is carefully included. When recording their work, candidates need to explain their practical work in sufficient detail and should assume the reader is unfamiliar with the centre and the specific content.

A few centres made submissions which were overmarked. Centres should use the marking criteria carefully and ensure they differentiate performance, only awarding full marks for excellent performances. Effective annotation by candidates was evident this year from some 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 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

Where candidates from individual centres carried out very similar investigations, this suggested that centres had led decisions on the practical work. Where it is not clear how the candidate selected and researched the topic, the teacher must annotate as required to ensure work is original.

Most candidates produced a hypothesis. However, some candidate reports contained identical hypotheses. Candidates need to relate their hypothesis to their own research and evidence it in a way which demonstrates their understanding of the investigation. This can be done by investigating different factors on a crop or livestock for example. Where candidates have developed the same hypothesis, this should be annotated as to whether it is original or devised as a group, and marks awarded accordingly.

Centres should annotate 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 appropriate 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 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 generally 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 many cases and this should be considered when planning an 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 might be measurements of growth of a crop or animal over a period of many 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.

Presentation of the data was generally good but sometimes data was presented in a simplistic way with little or no explanation. In some cases headings on tables and axis on graphs were not labelled. Stronger candidates 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 clearly labelled using appropriate units with a clear, sufficiently detailed heading. Graphs were annotated to ensure the reader

could understand what was being shown. These candidates identified any anomalies clearly and referenced them for further discussion.

Results of investigations need to be recorded in detail and for the highest bands of the mark scheme, with precision. Candidates need 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 identified clearly 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 on 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 is an area which would benefit from more focus as a significant proportion of 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 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 detail and attempted to demonstrate a clear understanding of this skill by explaining the limitations of their investigations. The strongest candidates took great 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 and 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 the candidates had achieved. This year a lot of candidates' work was supported with annotated photographs which were clearly identified using headings and were sometimes 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.

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