

AGRICULTURE

Paper 5038/12 Theory

Key messages

Candidates should read questions carefully and pay close attention to the command words used.

Candidates should be familiar with the syllabus terminology.

General comments

There were some very strong responses that demonstrated detailed knowledge. In addition, most candidates were able to attempt all of **Section A** and two questions from **Section B**, demonstrating good time management and planning.

It seemed that some topics, such as genetics and asexual reproduction, challenged weaker candidates. Organic production was another area where some candidates found it difficult to apply their knowledge.

Comments on specific questions

Section A

Question 1

- (a) (i) The question required candidates to label a soil profile. Most candidates were able to do this correctly.
- (ii) Only the stronger candidates could usually make two points here.
- (iii) Candidates were required to describe ways organic matter could be maintained. Manure and compost commonly featured in responses. Some weaker candidates referred to other farming activities that did not add organic matter.
- (b) Stronger candidates answered this question well and many candidates gained full credit. However, some candidates just repeated the question wording without suggesting reasons. The stronger candidates often showed excellent application of knowledge.
- (c) There were some very good responses to this question requiring a comparison of two soil types. Stating that sand has a low water-holding capacity alone was not creditable as a comparison was needed.

Question 2

- (a) (i) The majority of candidates demonstrated a good application of knowledge to the given crop rotation and were able to correctly write the three crops in the correct order for year 3. Some weaker candidates perhaps did not notice that a three-crop rotation was specified.
- (ii) Candidates were required to explain two benefits of using crop rotation. Many candidates applied knowledge of some potential benefits, such as breaking of a pest's lifecycle. Some candidates did not attempt explanation so full credit could not be awarded.

- (b) The focus of this question was the benefits of introducing livestock to a rotation. Stronger candidates suggested reasons well. Some thoughtful responses included economic aspects, such as spreading the cash flow of a farm.

Question 3

- (a) (i) The majority of candidates stated clearly how water was lost from a plant.
- (ii) Many candidates correctly identified relevant uses. Using water as a coolant was a common response from stronger candidates.
- (b) (i) Most candidates demonstrated a good knowledge of osmosis. Some candidates got the movements the wrong way around or confused their descriptions.
- (ii) Some candidates stated the plant would die without further comment. Stronger candidates seemed more able to focus on the precise question wording.

Question 4

- (a) (i) Stronger candidates demonstrated their knowledge surrounding crop storage well. Some candidates gave factors that were not environmental.
- (ii) Most candidates demonstrated a good knowledge of building materials and recognised that metal had many advantages, which they usually described clearly. Some weaker candidates included disadvantages.
- (b) (i) The majority of candidates recognised the importance of applying an insecticide to a building prior to storing a crop.
- (ii) It seems some weaker candidates may have benefited from more practice in calculating application rates and volumes. Partial credit was awarded for determining the correct total surface area of the building. Stronger candidates could perform the full calculation to find the volume of diluted pesticide needed. Some candidates did not give their answer to the required number of decimal places specified in the question.

Question 5

- (a) The question required an application of knowledge regarding flower structure and the process of pollination. Most candidates seemed to know about the role of petals. Many also knew stamens as a source of pollen. Beyond this, knowledge seemed more limited.
- (b) Stronger candidates correctly identified these parts. Weaker candidates tended to lack the precision of knowledge required.

Question 6

- (a) (i) Candidates were required to describe the role of different parts in a non-ruminant digestive system. There were some accurate descriptions achieving full credit. Weaker candidates often seemed to confuse a ruminant with a non-ruminant and some responses therefore could not be credited. Some weaker candidates also seemed to confuse the roles of the parts of the digestive system.
- (ii) On the whole, candidates demonstrated good knowledge with regards to labelling the parts of a chicken's digestive system. Weaker responses sometimes confused the caecum and the small intestine.
- (b) (i) Many weaker candidates found constructing a bar chart challenging. Scales and axis labels were sometimes incorrect.
- (ii) Many candidates recognised low temperatures or cold seasons as being correlated to low egg production.
- (iii) This question was answered reasonably well with many candidates suggesting a suitable nutrient. Some candidates gave only a feed.

- (iv) Many candidates were able to calculate a 10% additional difference. Some weaker candidates did not add this onto the original total.
- (v) The question required candidates to suggest why egg production increased. Stronger responses usually focused on an increase in animal welfare together with increased nutrients from foraging.

Question 7

- (a) (i) The question asked for two reasons for a range of daily water requirements for animals. Many candidates made suitable suggestions. Weaker responses sometimes suggested this varied with different animals but did not provide any further detail.
- (ii) There were some good suggestions as to why a dairy cow could require more water than a bull. Responses often suggested that it was due to the dairy cow producing milk.
- (b) The question was answered very well by most candidates.

Question 8

- (a) This area did not seem to be well understood by weaker candidates. Many candidates were able to label the penis. Further labelling was challenging for the weaker candidates.
- (b) The question required disadvantages of using artificial insemination rather than using natural mating on a farm. The stronger candidates usually mentioned that staff need to be trained, or referenced the time-consuming aspects of the task.
- (c) Many candidates could make at least one other suggestion. Strong responses mentioned using a virgin bull or culling infected stock.

Question 9

- (a) (i) Many candidates were able to define what phenotype meant. Weaker candidates did not seem clear on this area.
- (ii) Many candidates mentioned the identification of a desirable trait. Stronger candidates developed this further and explained the importance fully.
- (b) Many candidates achieved credit for predicting the ratio of chickens with a normal growth rate, but a significant number were not able to do this. Some candidates showed incorrect parental genotypes. Some weaker candidates used the wrong letter.
- (c) The question was answered well. Many candidates made suitable suggestions which demonstrated a good application of knowledge.

Section B

Question 10

- (a) Stronger candidates mentioned ground preparation and often some equipment to use to construct a fence. Some weaker candidates seemed focused more on livestock numbers within a field rather than the question. A few candidates incorrectly described building an enclosed structure with a roof.
- (b) Many candidates who answered this question discussed easier control of stock. Others often discussed increased productivity through allowing grass to regrow and prevent overgrazing.
- (c) The question required candidates to discuss improving pasture. Many candidates knew some suitable methods.

Question 11

- (a) Most candidates were able to name a local weed. Many answers demonstrated a good understanding of the harmful effects of weeds. Many responses discussed competition for nutrients, light and water. Some strong candidates also went on to describe weeds as hosts for pests and diseases.
- (b) The question required explanation of weed control by cultural, mechanical and chemical methods. Most candidates seemed to know a method of control for each area. However, weaker candidates did not develop their answers further. Some weak candidates stated chemical control from the question but did not take this idea any further.
- (c) Only stronger candidates answered this well. Candidates needed to think of how to determine the most effective method of weed control. Stronger candidates seemed to be able to apply a scientific approach, such as having separate plots and then making suitable observations.

Question 12

- (a) Candidates were required to define what was meant by asexual reproduction in plants. Many responses included reference to only one parent being required or that offspring were genetically identical. Some weaker responses confused asexual reproduction with sexual reproduction.
- (b) The question required candidates to apply their knowledge to the disadvantages of taking stem cuttings. Stronger candidates often discussed aspects such as disease entry through cut plant surfaces or the skill required to take stem cuttings.
- (c) There were some very strong responses that described many aspects of record keeping and some candidates developed answers well. Some candidates included consideration of records about pesticides used and pests or diseases encountered. Some included records relating to sowing and planting times.

Question 13

- (a) Most candidates demonstrated some good knowledge of what is meant by weaning. Some weaker candidates showed only limited knowledge on weaning and did not develop their answer further to receive full credit.
- (b) This question was answered very strongly with most candidates providing a clear and detailed response. Some weaker candidates seemed to have misconceptions about the processes and locations involved.
- (c) Stronger candidates showed an application of their understanding of the process of selective breeding. Weaker candidates seemed not to have a secure understanding of this process.

Question 14

- (a) Most candidates demonstrated some knowledge of what hydroponics meant. Many responses included some aspects, most commonly the idea of no soil and growing in water. The stronger responses could provide further detail.
- (b) Weaker candidates did not typically explain why agricultural land may be limited by topographical, climatic or environmental conditions. These candidates demonstrated quite a limited application of knowledge. Some weaker candidates were able to identify a factor such as cold or harsh weather, steeply sloped land or soil type limitations, but many of these weaker candidates could not develop this further to explain how these factors may limit the use of agricultural land.
- (c) Stronger candidates could discuss well the environmental benefits of organic production. There were many creditable responses. Weaker responses were generally limited to one or two benefits rather than demonstrating a breadth of knowledge of these benefits.

AGRICULTURE

Paper 5038/02
Coursework

Key messages

The strongest portfolios included original logbooks or authentic working notes, while weaker submissions relied solely on edited summaries and unannotated photographs, which provide limited evidence.

Investigative reports could be strengthened by deeper scientific reasoning in conclusions and deductions. In investigations, candidates often described results but did not explain them using agricultural principles or secondary research. In addition, limitations were sometimes underdeveloped. To access the higher bands of the mark scheme, candidates need to include multiple limitations with feasible improvements.

Data handling was generally good, but some candidates showed incomplete graph labelling and limited data processing. The strongest work consistently linked data presentation to analysis, producing more insightful conclusions.

General comments

Many portfolios showed strong organisation, clear presentation and a genuine enthusiasm for practical agricultural work. The majority of candidates produced well-structured investigations with clear aims, logical planning and thorough data collection. Photographic and video evidence was generally of good quality, often helped to support practical skills, and was usually well integrated. Where candidates included reflective commentaries, either written or verbal, this tended to significantly strengthen depth.

Some centres submitted only photographic evidence with limited explanation, which restricted the credit that could be awarded for skill demonstration. Investigative reports were usually well-presented, often typed and neatly bound, but some would have benefited from clearer annotation to indicate where credit had been awarded. Centres are encouraged to maintain high organisational standards while ensuring authenticity, sufficient reflection and adherence to syllabus requirements.

Comments on specific areas

Practical Exercises

Most candidates described their practical activities clearly and logically, often including helpful photographs or videos in support. Stronger candidates explained the purpose of each task, equipment used and the sequence of actions taken. Weaker descriptions were often brief or lacked context. The strongest work included reflections on candidates' activities and reference to problems encountered and adjustments made. Strong work included step-by-step descriptions supported by annotated photographs or authentic diary entries.

Stronger portfolios included thoughtful comments on what went well, what needed improvement and how skills could be developed. Authentic logbooks with dated entries provided particularly strong evidence. Weaker submissions included purely descriptive accounts. Reflection may be written, annotated on photographs or delivered through video commentary.

Practical Investigation

Most candidates selected appropriate, focused questions. Stronger investigations provided clear rationale based on background research. Weaker submissions were broad, vague or lacked a hypothesis. The strongest candidates linked the research question to scientific principles and referenced secondary sources.

Planning was generally good, with clear outlines of equipment, variables and methods. Stronger plans were detailed and referenced research. Some candidates omitted relevant variable control or complete methods. Strong examples demonstrated scientific reasoning, risk assessment and justification.

Data collection was often thorough. However, sometimes there was incomplete labelling, missing units or absent graph titles. Stronger candidates processed data using means, trend analysis or comparisons. Tables and graphs needed to be clear, accurate and fully labelled.

Many candidates summarised trends but did not explain them scientifically. Stronger candidates made deductions and linked findings to agricultural principles. The stronger deductions integrated data patterns with scientific reasoning and research.

Limitations were frequently underdeveloped in weaker examples. Stronger portfolios listed multiple limitations and paired each with realistic improvements.

Presentation was generally excellent. Stronger portfolios showed individuality, consistent formatting and clear referencing. However, some other portfolios lacked annotation. Candidates should ensure work is logically structured, labelled and easy to navigate.