AGRICULTURE

Paper 0600/01
Multiple Choice

Question Number	*Key*	*Question Number*	*Key*
1	**D**	21	**C**
2	**B**	22	**C**
3	**C**	23	**C**
4	**B**	24	**A**
5	**D**	25	**A**
6	**A**	26	**A**
7	**B**	27	**B**
8	**A**	28	**D**
9	**B**	29	**C**
10	**B**	30	**D**
11	**D**	31	**C**
12	**B**	32	**C**
13	**D**	33	**A**
14	**C**	34	**B**
15	**B**	35	**D**
16	**D**	36	**B**
17	**C**	37	**D**
18	**C**	38	**A**
19	**A**	39	**C**
20	**A**	40	**B**

General Comments

There continues to be an overall improvement in candidates' results with a mean score of 29.02 (72.5%). In 2008, 28.35 (70.9%). In 2009 the spread of marks ranged from 12 to 38. In 2008, 6 – 40.

The majority of candidates had little difficulty with items numbered 1, 2, 3, 4, 7, 8, 9, 11, 12, 13, 15, 16, 18, 20, 21, 22, 23, 24, 26, 29, 31, 33, 38 and 39. Items numbered 6, 25, 30, 34 and 36 were slightly more difficult but 60% of candidates gave correct answers and there were no significant misconceptions.

Two areas of weakness merit some comment. As a topic, Livestock Breeding (items 27and 28) presented some problems and it appears as though candidates could not 'work out' crosses which were not exactly those they had seen before suggesting limited understanding of the principles of inheritance. Difficulty in interpretation of diagrams or working out problems was also evident with items 14, 32 and 40.

Comments on specific items

Item Number

5 35% of candidates selected **C** pH 6 which was the reading on the meter (illustrated) before liming. It was disturbing that so many did not appreciate that liming raises a soil's pH value.

10 Over a quarter of candidates selected **A** suggesting a poor understanding of the simple anatomy of the maize plant. It should be recognised that the term *silks* refers to the styles.

14 The poor response to this item (43% correct) indicates, once more, a poor knowledge of measurements, or possibly a lack of practical experience in soil preparation and the sowing of cereals. A quick glance at a ruler would have pointed to the correct answer.

17 Over half of the candidates failed to recognise that "powdery leaves" are a sign of fungal infection. Each one of the fungal diseases, listed in the syllabus, produces these signs at some stage of their life cycle.

19 Understanding of the ruminant digestive system is an essential feature in any study of livestock. It was therefore disappointing to find that only 40% of candidates gave the correct answer.

27 This item was a problem to be 'worked out' by sketching a diagram on the question paper. The first statement indicated quite clearly the dominance of tall plants. Thus the genetic make-up of a heterozygous tall plant could be expressed as Tt and a dwarf plant as tt. Thus the result of this cross could be illustrated:

Parents	Tt x tt
Gametes	(T or t) (t or t)
Offspring	Tt Tt tt tt
	2 Tall 2 Dwarf Therefore ratio 1 : 1

Over 30% of candidates gave **C** 3 : 1. This suggests that they were simply remembering a cross between two heterozygous parents.

28 As with item 28, only 40% of candidates were able to work out this problem. Since the allele B for black colour was dominant to the allele b that gave a red colour, it should have been clear that only a heterozygous black bull could sire red calves. Thus the genetic make-up of the black bull could only be Bb. Thus a cross with a red cow could be illustrated: -

Parents	Bb x bb
Gametes	(B or b) (b or b)
Offspring	Bb Bb bb bb
	black calves red calves

Thus both the bull and the black calves have the same genetic make-up, Bb, giving **D** as the correct response.

32 50% of candidates gave the incorrect response **B** because they expected the corner post to need support. Careful examination of the diagram would have shown that the bracing wires are supporting the fence posts.

35 The fact that pressure increases with depth is clearly stated in the syllabus and it was surprising to find that only 41% of candidates gave the correct response **D**. Incorrect answers were evenly divided amongst the distractors suggesting that the topic has not always been taught.

37 Only a quarter of the candidates gave the correct answer **D**, with the majority selecting **B**. There can only be one reason for this error; careless reading of the question. Rusting of tools is largely related to moisture and the only one, of those illustrated, likely to become wet during normal use is the trowel when digging soil. No doubt **B** was selected because it has a moving part, but this requires oil for lubrication, not to prevent rusting.

40 The illustration was of a very well recognised graph showing the Law of Diminishing Returns and it was surprising that almost a quarter of the candidates indicated **D** Supply and Demand.

AGRICULTURE

Paper 0600/02

Core Theory

General comments

This paper is set as an option to paper 3 although some questions have parts in common. It examines the core syllabus and is set to differentiate between grades G to C. Paper 3 is designed to differentiate between the higher grades and to test the supplement syllabus.

It is particularly important that the core paper is accessible to the less able candidates.

Since the introduction of the core paper in 2004 there has been a steady increase in the marks achieved at the lower range. In 2004 the bottom of the mark distribution was 13% this year it was 26%. The top mark on the paper has remained steady at around 57%.

The paper consists of nine structured questions. Each structured question starts with parts aimed at grades G-F, followed by a middle section aimed at F-D. The final part, that includes open-ended responses, is aimed at grades D-C. The command words such as, 'state' and 'list' introduce low-level question parts. 'Suggest' and 'explain' indicate that higher-level answers are required. It is important that candidates are taught the significance of these command words. State, describe, explain and suggest all have specific and different meanings - see syllabus appendix, page 42.

Diagrams are used to help prompt candidates.

Candidates are expected to have practical experience of Agriculture and questions are set to test this in the theory paper.

Some questions require a definition. These must be clearly stated, concise and use words that are chosen carefully to prevent other meanings.

When answering data analysis questions candidates must take care to respond to the data given and not base their judgements on what they know.

When answering extended writing questions candidates need to be aware that they must write sentences, a requirement for a C grade, and not give one word responses. If an explanation is asked for, this should be clearly stated, rather than providing just a short statement which leaves the Examiner to make connections.

It should also be noted that questions requiring suggestions and opinions do require factual knowledge; superficial answers do not gain credit. Awareness of the mark allocation is also important in such questions. These often have 3 marks which indicate that more than one idea or comment is needed and that elaboration is required.

Comments on specific questions

Question 1

This question tested general agriculture. The style of tasks set was different from normal and included some data analysis. Candidates responded well and this was the highest scoring question on the paper.

(a) The most commonly stated use for timber was for fences.

(b) Some candidates did not read the question and stated ‘food’. Most correctly gave ‘shelter’.

(c) Very few candidates were unable to name a cereal crop.

(d) This was a different way of testing the uses of livestock by Man and it worked well. Some candidates did not keep to the required six ticks.

(e) (i) The need for foreign exchange was well appreciated.

(ii) The expected answers were high transport costs (that would affect profits) and shortages of the product at home. Not all farm products are perishable food so answers that suggested deterioration during transportation were not credited.

(f) (i) The bar chart was correctly interpreted by most. Candidates who correctly gave the specific areas instead of the continents got one mark.

(ii) This was aimed at C grade candidates but few appreciated the reasons why Africa would not benefit from bio-fuels. The most obvious answer is that land is needed to grow food crops. Africa also has comparatively little demand for fuel.

Question 2

A question that required recall of knowledge about soil, some data analysis and some extended writing**.**

(a) (i) (ii) A soil profile diagram that posed no difficulties.

(b) Candidates had to complete a table of soil particle sizes. Loam was often given instead of sand. The particle size of silt is 0.02 - 0.002 mm. Those who got it the other way round were credited.

(c) This involved analysis of pie charts. The one which represented a poorly draining soil was **A**, because it consisted of tightly packed clay particles.

(d) (i) (ii) This was the most poorly answered question on the paper. Clearly pipe drainage is not being taught nor is it part of any practical work undertaken. The drain consists of a perforated or porous pipe placed at a depth of 0.5 m. It is sometimes supported by gravel. The advantages it has over open ditches in grazing land are that more land is available for grazing and there is no danger of animals getting into ditches and eroding the soil when drinking.

Question 3

This was a straightforward question on fertilisers and the nitrogen cycle. The main difficulty candidates had was producing exact definitions of ‘organic’ and ‘crop rotation’.

(a) The definition of an organic food crop is a crop that is treated using natural fertilisers and one that is not treated with chemical herbicides or insecticides. Statements such as ‘no chemical used’ did not gain credit - there are chemicals in organic manure. Some thought an organic crop was one that would break down into organic compost.

(b) One disadvantage of using FYM and Kraal manure is the fact that its precise composition is unknown so it might not have the required effect. It also can introduce pests and weed seeds to the garden plot. ‘Smelly’, was rejected. ‘Bulky to transport’ was allowed.

(c)(i) (ii) K stands for potassium and it is mainly used in the development of seeds and fruit. This had been either taught or learnt or it had not.

(d) A definition that was quite difficult for many to describe succinctly. Crop rotation is the growing of different crops in a regular sequence on one plot of land. The reasons for doing this are to prevent soil exhaustion and the occurrence of specific pests and diseases. The reasons, however, were not required in the definition.

(e) This question, although straightforward, was not well done. The nitrogen cycle illustrated was possibly not one candidates were familiar with and this might have put them off placing the letters on the diagram. The question was asking for the place in the cycle where nitrogen fixation takes place.

Question 4

A straightforward question on the principles of plant growth.

(a) Wind affects crops by increasing water loss which leads to wilting, it aids pollination and, if severe, may flatten the crop and break the stems. 'Damage the crop' without qualification did not get a mark.

(b) This part of the question required application of knowledge. High humidity within the cloche would provide ideal conditions for fungal infection. The seedlings would grow fast and they might be weak so requiring careful hardening off. They would not wilt. 'Seeds will rot' was rejected as the plants were clearly established.

(c) (i) (ii) The answers to parts **(i)** and **(ii)** were well known - transpiration and xylem.

(iii) Candidates had trouble producing a clear definition of osmosis. Some textbooks do not have the most recent definition. Thus it is important to clearly indicate what is meant by 'concentrated solution'. Water molecules move from an area of high water 'concentration' potential to a low one or water moves from a solution with a low solute concentration to one with a high solute concentration.

Question 5

This question did not work as expected.

(a) A very easy introduction to identifying safety clothing. A minority of candidates suggested, wrongly, a face shield.

(b) The majority of candidates failed to interpret this part correctly despite the key word being emboldened. The precautions asked for were those taken **when** spraying i.e. **'**do not spray in windy conditions', **'**direct nozzle close to the plants', do not spray near a water source'. Mixing correct dilutions and washing hands were not credited.

(c) Many candidates made too much of this part. The answer was simple - do not wash equipment in or near streams and use a lot of water to ensure dilution of the chemicals.

(d) This part gave candidates a chance to write extended prose which most did not take. In fact most of the short answers did not refer to biological control at all. This is clearly stated in the Syllabus, 2.4.2.

Question 6

This question tested reproduction.

(a) The diagrams of a male ruminant and a bean flower had to be labelled and most candidates scored maximum marks. The most common error was to mistake the stigma for the anther in the bean flower.

(b) Castration results in infertility. Those who stated the animal **may** not breed were not given a mark. Answers suggesting that it was painful did not gain a mark either. It does make males calmer and they do have a tendency to put on weight.

(c) Lactation was well known and was an easier process to define than previous definitions on the paper. Some confused it with gestation.

(d) Colostrum has high levels of protein and fat as well as providing antibodies to fight disease in the offspring. As this was the higher level part of the question general comments like 'provides food' and 'combats disease' where not credited.

Question 7

This question which was structured around chickens was well done by a lot of the candidates. Disease has been well covered by centres for some time and these results suggest that genetics is now being taught more successfully.

(a) (i) Candidates successfully indicated the general signs of illness in chicks in most cases.

(ii) Isolation was the answer wanted. Vaccination was not credited for the illness might be one that does not respond to such treatment.

(b) The table describing a balanced diet was quite well completed. The mark that was missed most frequently was vitamins. Some candidates gave two roles for carbohydrates in the animal. Only one was needed so if one was correct and the other wrong they cancelled each other out and no mark was awarded.

(c) There was no mark for selecting production ration, it was given for the reason which had to be related to the ration, ie high in protein, and not to the fact that the chick was growing.

(d) (i) The definitions of a gene given were very variable in quality. Many implied that it was the unit of inheritance which passes from parents to offspring so got the mark. It is a definition that does need to be accurately expressed. Others defined it in terms of being part of a chromosome, some mentioned DNA.

(ii) The genetic diagram was well worked, most candidates giving MM and Mm as the genes.

(e) The answers to this part were encouraging. It led on from the previous part and one mark was commonly gained for showing the possible genotypes from the cross. Slightly fewer candidates got the second mark for explaining the mm individuals had no rapid growth gene.

Question 8

This question required candidates to apply their knowledge to the construction of farm buildings. It did differentiate between the better and weaker candidates.

(a) (i) The A frame was quite well known but the drawings of it were variable.

(ii) The corner posts have a particular function in any building and to say, 'setting them in concrete gave the building strength', was too simplistic. The mark scheme was looking for stability or no lateral movement. The other mark was for preventing the base of the post from rotting or being eaten by termites.

(iii) To achieve the mark the candidate had to state that there was more wire in building B to let the air in.

(iv) To achieve the mark the candidate had to state that brick and cement provided a strong wall that could not be chewed, or pushed in by predators. Some candidates suggested the high windows provided better protection. This was not credited. If a reference was made to building **A** only having flimsy sacking walls a mark was given.

(b) This part was the second most poorly done on the paper. Very few well written descriptions were given. Many candidates did mention putting in pipes from the stream to the building. Very few suggested using pumps or water towers to provide flow. Storage tanks inside the building releasing water into the drinking trough by use of a ball valve were not mentioned.

Question 9

This was the most difficult question on the paper for the weaker candidates as it involved a high level of reading and analysis.

(a) This was meant to be the easy mark but a surprising number of candidates did not name a local weed of pasture.

(b) (i) **A** was the answer and no reason was needed.

(ii) A slow growing grass with deep roots should survive overgrazing, **B**.

(iii) A grass used in a rotation needs to be quick growing with a good yield. Both **A** and **D** would suit.

(iv) As grass **B** prefers heavy soil it would not grow well if lime broke the soil up. Some candidates stated **C** but to get the mark they had to make it clear that the sandy soil it preferred would be acidic.

(c) The definition of carrying capacity had to clearly indicate that it was the number of animals (LSU) that an area of land can support **without** deteriorating. Many still confuse carrying capacity with stocking density.

AGRICULTURE

Paper 0600/03
Extended Theory

General comments

Candidates appear to have been well prepared for this examination. Almost all candidates were able to attempt most parts of every question. It was pleasing to note that few, if any, candidates appear to have been entered for the wrong tier of entry.

Areas of the specification that appear to present the greatest difficulty for candidates and resulted in confused answers were the terms inorganic and organic production and the term sustainable.

At times candidates appear not to have read the question carefully before attempting to answer resulting in weak or incorrect responses.

Centres are advised to make clear to candidates the expected responses to the key command words, describe, suggest, state and explain. It is important that the candidates respond to questions in a way that makes their answers clear to the Examiner and does not simply assume he/she knows what they mean.

In general it was pleasing to note an improved performance throughout the paper by most Centres this year.

Comments on specific questions

Question 1

(a) (i) All candidates could name a cereal crop.

(ii) Most candidates had no problem in ranking the countries. To gain full marks all parts had to be correct.

(iii) The responses to this question were very varied, but most indicated that using crops to provide food was a much higher priority than using them for fuel.

(iv) Almost all candidates understood that increased growing of fuel crops would increase the price of food crops. This was sometimes expressed in a confusing way but if the meaning was clear a mark was awarded.

(b) This section was poorly answered and resulted in a variety of confused responses.

(i) Very often vague and negative statements about inorganic fertiliser were made, but not linked to long term sustainability. Better candidates discussed loss of organic matter and its effects on the micro-flora of the soil or the tendency of nitrate fertiliser to lower the soil pH.

(ii) Some good responses linking ploughing of grazing land to soil erosion and loss of nutrients were given.

Question 2

(a) (i) Almost all candidates identified Soil A. Some said clay which was not the response required as candidates were expected to refer to one of the four soils, A, B, C and D, shown in the pie charts provided.

(ii) Answers indicating the high proportion of clay were credited with a mark.

(iii) The answers to this were poor. The question was marked positively and any relevant points were credited. The best answers described the pipe as being made from clay or perforated and then provided additional detail e.g. the idea of a pipe network.

(iv) Some candidates considered pipe drains easy to install and were credited. The drains last a long time with low maintenance. Many candidates gave reasons for not using ditches such as the possibility of livestock falling into the ditch or the need for regular maintenance, all creditworthy responses.

(b) (i) Most candidates had no problem with this question but a few weaker candidates confused and incorrectly labelled the axes of the chart.

(ii) Almost all candidates correctly identified Destroyall.

(iii) Factors relating to deciding which pesticide to use were poorly understood and explained. The most common answers were cost, toxicity, ease of application and persistence. Some candidates suggested the season or weather but without qualifying these answers the candidate was not awarded marks.

Question 3

(a) It is important to advise candidates to place letters as close as possible to the correct position when asked to write on a diagram. A number of candidates place the letter **F** in the air or in the soil well away from flow arrows. Some candidates placed an **F** incorrectly where denitrification occurred or where decomposition was occurring.

(b) Most candidates gave examples of a simple rotation that they knew and gained full marks**.**

(c) Many candidates gave more than two creditworthy responses. The benefits of rotation were clearly well understood.

(d) Almost all candidates could name a legume. The most common incorrect answer was potato.

(e) Most candidates described nitrogen fixation and decomposition of organic matter and made frequent reference to improved soil structure, demonstrating good understanding of the process.

Question 4

(a) (i) Candidates clearly have a good knowledge and understanding of osmosis. Terminology was very different between Centres with the terms weak and strong solutions most commonly used. Few Centres described the process in terms of the concentration of water or differences in water potential. The use of these terms should be encouraged to avoid confusion and in preparation for further studies in life sciences.

(ii) Good descriptions of plasmolysis were frequently given. Weaker candidates simply described the effects on the plant and gained credit for this.

(b) (i) It was pleasing to see that most candidates understood that wilting reduced the plants' surface area and the rate of water loss by transpiration.

(ii) Some candidates failed to read this question correctly which resulted in poor confused answers. Shade was usually given but expressed in a variety of ways. Quite a few candidates related the presence of trees to the micro-climate effect of promoting precipitation and were credited for this.

Question 5

(a) Candidates usually gave three correct responses for storage of grain. 'Good roof' and 'dry' were often given and credited but candidates should be encouraged not to give such similar answers.

(b) Many different crops were named and candidates gave good descriptions for signs that a crop was ready to harvest. Candidates need to be reminded that the number of lines provided gives them guidance as to the expected detail.

(c) Far too many candidates described why consumers prefer organic crops and failed to give a justification for the use of inorganic fertilisers. Up to 2 marks were given for examples e.g. know how many units are present, increased yield, strong healthy plants. This area of the specification is often poorly understood and tends to result in emotional and political responses rather than scientific responses.

Question 6

(a) (i) Candidates could rarely describe a gene. The best responses included a description with an example to help clarify their answer.

(ii) Most candidates could draw a suitable genetic diagram**,** although few used a genetic square.

(iii) Only the more able candidates appreciated the presence of a double recessive and the effect it would have on the offspring.

(b) (i) Castration was not well understood. The most common incorrect answers included pain, kill the bull, stops pleasure and makes the animal dangerous. Better candidates gave suggestions that it makes the animal easier and safer to handle and avoids interbreeding.

(ii) Candidates had a good understanding of the testing required before an animal can be used for AI. Candidates frequently used the terms performance and progeny testing, showing a good understanding of this topic.

(iii) A wide range of responses for the reasons for farmers preferring a bull or a boar were given. Any possible answers were credited as local experience and practice were very clear in the answers provided

(iv) Lactation was poorly described and 'giving milk' was insufficient to be credited. Candidates were expected to define it as the period of milk production from birth to becoming dry. Credit was given if this was implied.

(v) Two clear points were required or one well explained. Most candidates described digestibility. Better candidates identified the role of immunity and disease resistance.

Question 7

(a) This was well answered. The most common responses were:

- advantages of a deep well - gives reliable and clean water.
- advantages of a small stream - gives clean and accessible water
- disadvantages of a shallow well –easily polluted and may run dry
- disadvantages of a large river - flooding was often given and not credited, the expected answers were dirty or polluted or more expensive to treat.

(b) Many possible methods of filtering and treating were given. Credit was given for any possible filtration process followed by sterilisation with chlorine or boiling the water. Most candidates gained full marks for this part of the question. It was interesting to read the diverse ways that candidates used to obtain their drinking water.

Question 8

(a) It was pleasing to see that most candidates understood that the purpose of a machine is to make work easier.

(b) (i) The expected answer was A, a rotovator, however if a spade was given and at least one appropriate reason for part **(ii)** was given, a spade was also credited. It was evident that this was a common practice.

(ii) Almost all candidates gave two good reasons, often related to cost, access or ease of repair or maintenance.

(c) (i) The tractor was the expected answer and most candidates answered this correctly.

(ii) Correct answers such as 'able to do more work' or 'could travel between farms' were frequently given and fully explained. Candidates clearly enjoyed this question.

Question 9

(a) Most candidates described four stages of preparing land and gained marks for this. It was disappointing to note how few described the preparation of a tilth and seed beds in any detail but concentrated on clearing vegetation and sowing grass, or the application of fertiliser.

(b) Most candidates described two budgetary factors and linked these to cost and increased output and income. Some weak candidates described points to consider but failed to make any financial link and were not credited.

It was interesting to note that part **B** was answered far better than part **A** by most candidates.

AGRICULTURE

Paper 0600/04

Practical

General comments

The entry for this component remained constant this year.

Once again some Centres entered work that was clearly project based which made marking difficult because the assessment criteria could not be met. Teachers should check the Assessment Criteria, which are included in the current year IGCSE syllabus, before starting to prepare candidates for practical tasks. This will help in the planning of exercises that can differentiate between A* and G level candidates. The failure of exercises to differentiate is the most common criticism in Centre reports. Too many exercises test basic skills only.

One way of achieving differentiation is to construct worksheets that offer options and extension work. The work is then assessed using mark schemes that recognise different levels of achievement. The mark schemes used should be included with the samples of candidates' work sent for external moderation.

Ideally Centres should provide one task from each of the syllabus sections; soil, growing crops, livestock husbandry, farm structures and agricultural economics. Very few Centres do this. Centres that just test the aspects of preparing a garden plot, growing and harvesting crops, are reducing the opportunities for candidates to demonstrate a full range of skills. Such work realistically covers three practical exercises - seed bed preparation and planting, tending the growing crop with measurements of growth and harvesting with a calculation of yields. To complete the selection a soil test practical and a farm structures activity, such as block making, should be undertaken. Activities with livestock could also be carried out for two exercises, but it is appreciated that not all Centres have the facilities for keeping animals.

It is not essential to test all candidates on the same exercises. Nor is it essential that every task should be used to assess all of the criteria.

It is important that some of the tasks should generate written work that can be used as proof of individual involvement and provide an indication of quality. Descriptions, for instance, of how a garden plot is cultivated or how cement blocks are made are suitable for this purpose. The candidates should refer to any problems encountered in their work and emphasise any safety precautions taken. Measurements of plants' growth and crop yields or production figures from animals provide data that can be tabulated and then represented by a graph or pie chart.

Photographs of candidates carrying out tasks are also useful evidence of work done.

Internal moderation only needs to be carried out by teachers when there is more than one teaching group in the Centre.

For external moderation a sample of ten candidates' work together with their record cards, is required with the work sheets and marking schemes used for assessment. The work sent should include the top and bottom marks and a range in between. Any difficulties experienced by the Centre in carrying out the assessments can be included. The Centre summary mark sheet should be sent with the samples along with a copy of the MS1 on which the Centre marks have been entered.

AGRICULTURE

Paper 0600/05

Project

General comments

This paper continues to attract a small entry of above average candidates worldwide. In 2009 there was an increase in the number of candidates undertaking this component as compared with 2008.

It is important that teachers new to this component check the Assessment Criteria before starting to prepare candidates for the project. These criteria are included in the current IGCSE Syllabus.

It is expected that prior to the selection and carrying out of the project candidates will have been made aware of the assessment criteria and taught what a hypothesis is and how to design a questionnaire, control variables, collect data and select suitable graphs. The nature of limitations should be discussed and the required layout of the project should be described.

The regulations for paper 5 allow teachers to monitor candidates' progress and to offer advice. In some assessment criteria the amount of help given will affect the mark awarded. The nature of the help given should be recorded on the individual candidate record card.

Assessment criteria that continue to cause problems are 'planning', 'background study', 'deductions' and 'limitations'. The plan put forward must enable answers to the questions posed to be found out. It should indicate how variables are to be controlled. It ought to include a detailed account of the experimental method and the procedures to be followed. For background the material recorded should relate specifically to the project being undertaken by the individual. In deductions the evidence needs to be thoroughly analysed and commented upon with adequate detail. Under limitations any flaws in the experimental plan that became apparent should be commented upon as well as describing the things that went wrong due to unforeseen circumstances and human failings. Suggestions as to how the limitations may be overcome should be put forward.

The presentation of many of the projects was once again excellent. Many demonstrated good use of computer graphics. In a minority of Centres computer graphics should be introduced as the method of candidate recording.

Group projects can be acceptable but the individual contribution of each candidate has to be assessed. This is made more difficult if the projects are produced on a word processor. It is important in such situations that the teachers monitor each individual's progress and record marks with explanatory annotation on their record cards. Candidates in group projects should be encouraged to put their own 'stamp' on common sources.

As usual, experimental comparisons provided successful projects. The projects included comparisons between potted and soil-grown plants, effects of spacing, fertilisers, plant growth enhancers, thinning and ridging on plant growth. The effect of diet comparison was an example of livestock involvement. Measuring plants needs to be undertaken with care. Length and width of leaves are not good indicators of growth in many plants, height is more significant. Candidates sometimes measured fewer than five leaves and this is insufficient to produce valid data.

Some pleasing surveys were included this year and they achieved a good standard. The topics chosen by candidates showed a real awareness of Agriculture in the wider context of country and society, for example: effect of ticks on livestock production, impact of swine 'flu on trade, deforestation and agriculture and Food Aid and its effects on farming. Candidates must ensure that sufficient questionnaires are completed in order to collect enough data for subsequent analysis. The data from the questionnaires must be tabulated prior to producing pie charts or bar graphs.

Internal moderation only needs to be carried out by teachers when there is more than one teaching group in the Centre.

For external moderation the Board requires a sample of ten projects – the one awarded the top mark, the one given the lowest mark and the others should represent the full spread of marks. It would help if projects were presented in plastic wallets rather than bulky hard back files.

The annotation by teachers of the candidate record cards is appreciated and is of great assistance during external moderation. Comments that indicate how much guidance has been given and the problems encountered by the candidate help the external Moderator to understand how the marks have been awarded. This is an area which should be developed by more Centres.

Whole numbers must be used when assessing criteria and these should then be recorded on candidate record cards. On no account should half marks be used or recorded.

Each Centre should ensure that the completed Moderator copy of form MS1 be sent with the sample of work for moderation.

It is essential that all teachers responsible for teaching this syllabus are fully conversant with all assessment criteria and they need to ensure that candidates follow clear guidelines.