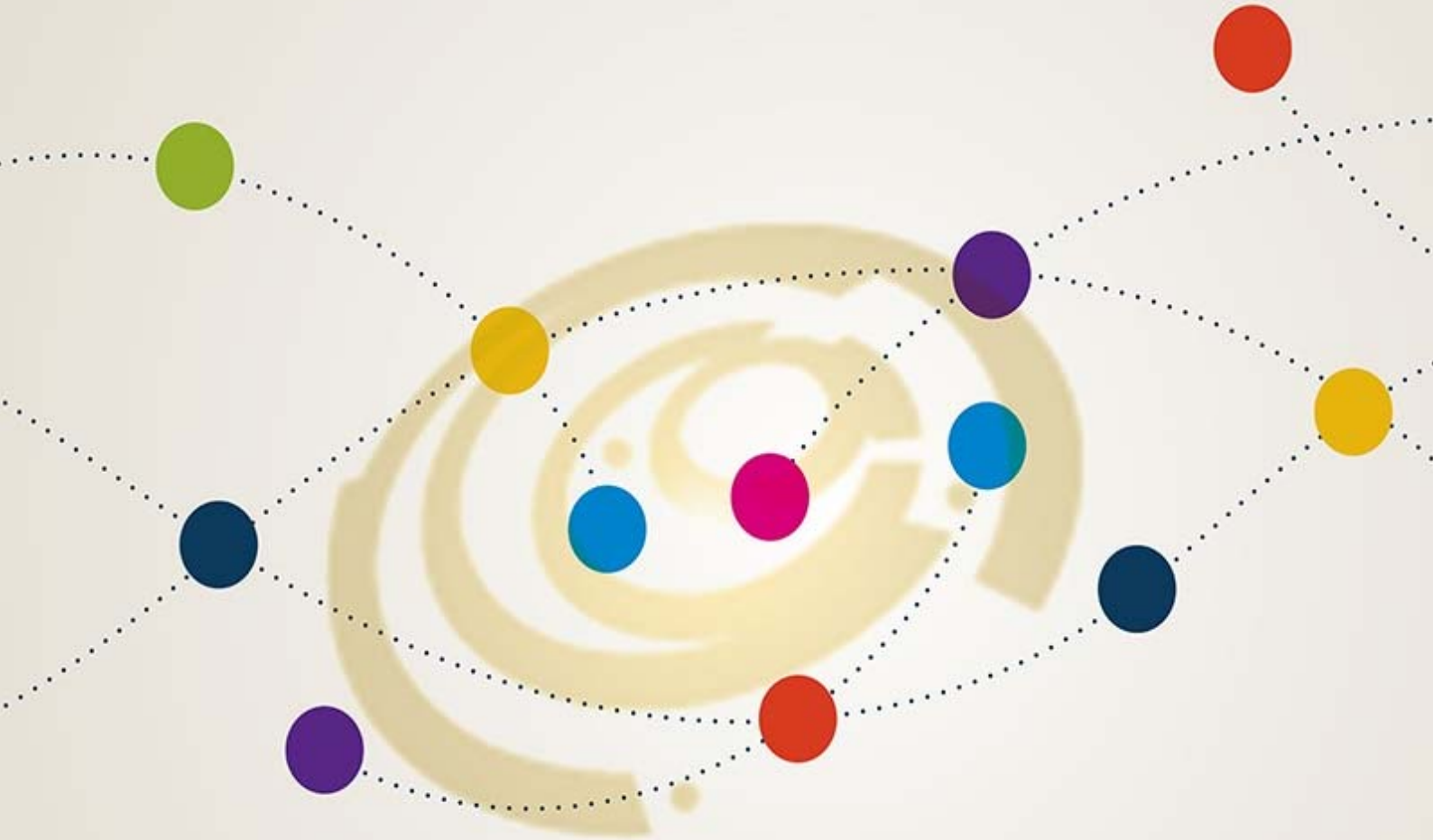


Background Paper for Leaving Certificate Agricultural Science: Consultation Report

NCCA

March 2015

Contents

1. Consultation on on LC Agricultural Science

Introduction

1.1 Consultation process

The background paper and brief for Leaving Certificate Agricultural Science was approved for consultation by Council in September 2014. An initial meeting of the Leaving Certificate Agricultural Science Development Group was held in October 2015 to consider the background paper and to discuss a draft of the online questionnaire in which a range of issues were presented for feedback. The background paper and the online questionnaire were published on the NCCA website at the start of November 2014.

The consultation process was conducted in the period Nov 2014 – Jan 2015 and feedback was obtained through a number of different elements:

- an online questionnaire (see Appendix 1)
- student focus group meetings (2nd level and 3rd level)
- submissions.

The online questionnaire was opened on 3rd November 2015 and closed on 19th December 2014. Focus group discussions took place in December 2014 and January 2015. The 2nd level student focus group meetings were conducted in two schools:

- School A: an all-girls school in Dublin city
- School B: a mixed, rural school in Co. Cork.

The student groups comprised 10-12 students who were studying LC Agricultural Science; one group of fifth years and one group of sixth years. The 3rd level student group involved 15 students from different year groups at University College, Dublin who were studying Agricultural Science.

A submission was made by Agri Aware in December 2014 at a specially convened meeting for their sponsors, following a survey they conducted to gather feedback. In January 2015, the Agricultural Science Association (ASA), which represents Agricultural Science graduates, made a submission following a survey of their members. In both cases, the survey was based on the NCCA online questionnaire. The Health and Safety Authority re-submitted previous correspondence and offered to provide updated information and materials for consideration by the development group as it prepares the new specification. The Irish Co-operative Organisation Society (ICOS) also made a submission.

The remainder of this section of the report provides greater detail on each of the consultation elements, while section 2 summarises the feedback received. Section 3 of the report describes the specific issues and challenges arising from the consultation which will need to be taken into consideration in the development of the new specification for LC Agricultural Science.

1.2 Online questionnaire

The response questionnaire was divided into six parts:

1. Participant's details
2. The scope of LC Agricultural Science
3. Purpose(s) of Agricultural Science in senior cycle
4. Science investigation skills
5. Assessment of LC Agricultural Science
6. The brief for the review of LC Agricultural Science.

The detailed questions and format in each part of the questionnaire are given in Appendix 1.

In total, 66 responses to the survey were collected. However, only 53 of these contained responses to the specific questions in parts 2-6 of the survey. Figure 1 illustrates the breakdown of the participants.

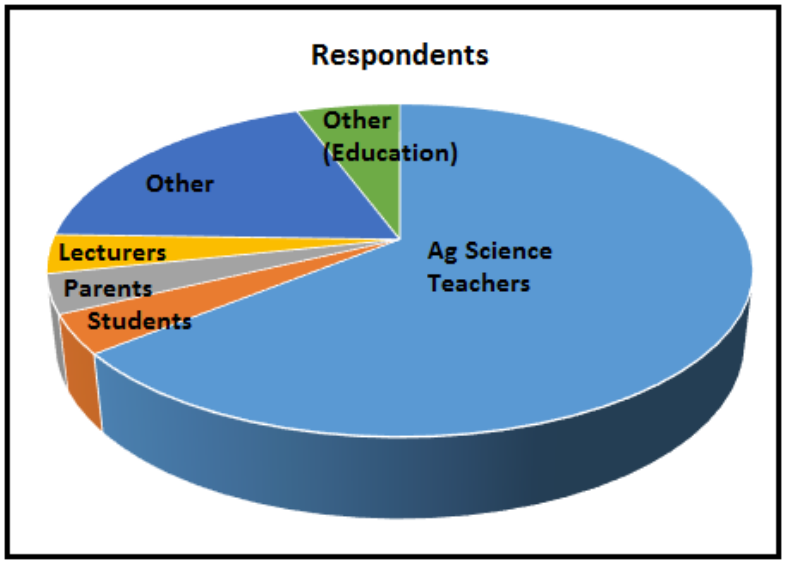


Fig. 1 Categories of respondents

Almost two-thirds of the respondents were LC Agricultural Science teachers, 4% were parents, 4% were third level lecturer/researchers and 4% were second-level students.

A number of respondents indicated that they were representing a group or organisation:

- Irish Agricultural Science Teachers Association – 3 branches/groups
- National Vegetable Society of Ireland
- Academics in the School of Agriculture & Food Science – University College Dublin
- Teagasc
- Irish Draught Horse Breeders Association
- WorldWise Global Schools.

1.3 Student focus group discussions

Three focus group meetings were held, as follows:

1. In December 2014 an initial meeting was held with each of two second-level student groups, as indicated above. In one of the schools, approximately half of the students were studying both LC Agricultural Science and LC Biology, with a small number also studying LC Chemistry. In the other school, all of the students were studying Agricultural Science only; they did not have the option of also studying LC Biology. A few of this group were studying LC Chemistry. In each case, the meeting sought to get feedback from the students on

    - their reasons for choosing to study LC Agricultural Science
    - what they liked/did not like about the subject
    - what elements of the course they would like to see removed, and why
    - whether they were also studying LC Biology and the extent to which this was an advantage
    - what topics they would see as important to include in a revised specification for LC Agricultural Science
    - their views on the current assessment arrangements for LC Agricultural Science
    - suggestions for assessment arrangements under a revised specification.

2. A follow-up meeting was held with each of the groups to explore in more detail some of the points they raised at the initial meeting:

    - a Core and Options arrangement to accommodate additional areas of study which had been suggested, as well as enabling an element of specialisation
    - practical coursework/investigations and a student project, including assessment of this aspect of the course.

Arrangements were made with each of the schools to facilitate a group discussion of these points in advance of the second meeting.

3. In February 20151 a focus group meeting was held with a group of third-level Agricultural Science students at UCD. This was a mixed group of students from four different years, some of whom had not studied LC Agricultural Science. While some of the questions were of a similar nature to those for the second-level groups, discussion included the effect of their study (if any) of LC Agricultural Science on their choice to study Agricultural Science at college and whether it provided a significant advantage in terms of knowledge and skill. In the case of third-year and fourth-year students, some found it difficult to recall much detail from their second-level study of Agricultural Science. Almost one-third of the group had not studied LC Agricultural Science (but had studied LC Biology). In light of their current study, a couple of students offered the opinion that the study of LC Chemistry was of greater benefit.

1.4 Submissions

Four submissions were received:

1. Agri Aware surveyed its patrons/sponsors in November 2014 and organised a meeting to discuss the feedback they had received. The NCCA was invited to attend this meeting in order to hear the views of the patron organisations and to engage in discussion of the issues and ideas that had emerged. The list of participating organisations is included in Appendix 4. A summary of the feedback from the Agri Aware survey and a range of points from the discussion at the meeting with patrons were subsequently forwarded to the NCCA.
2. In January 2015, the Agricultural Science Association requested a copy of the NCCA questionnaire to facilitate gathering feedback from their members. They conducted an analysis of the feedback received from over 100 members and made a written submission which summarised the main points they wished to make in relation to the current syllabus and recommendations in respect of a revised specification for LC Agricultural Science.
3. The Health and Safety Authority drew attention to a previously submitted paper on aspects of farm safety and how this topic might be included in the proposed new specification.
4. The Irish Co-operative Organisation Society submitted a proposal advocating the inclusion of material in the new specification related to the presence and role of co-operative businesses in a range of agricultural and food-related areas.

[1] It was not possible to arrange this meeting at an earlier date, due to college examinations.

2. Feedback from the consultation

2.1 The Background Paper

The background paper was seen as a very welcome, if overdue, step in the revision of the current LC Agricultural Science syllabus. In general, replies to the online questionnaire provided a comprehensive set of responses to all of the issues raised in the Background Paper and a significant number of respondents elaborated on the points of discussion which were raised in the paper. While the paper was not an explicit aspect of the student focus group meetings, many of the issues raised in the paper arose in the discussions.

2.2 The online questionnaire

This section of the report provides an overview of the levels of response under the various headings in the online questionnaire and includes comments made in respect of many of these.

- **Q.5 The scope of LC Agricultural Science**

Table 1 overleaf shows the levels of agreement with the statements about the current syllabus. About 70% of respondents agree or strongly agree that elements of the current syllabus are no longer relevant to agricultural practices. Only 25% consider that there is too much practical coursework, while almost 80% agree or strongly agree that not enough attention is paid in the current syllabus to sustainability and the environmental impact of agriculture and food production. A number of respondents remarked on the overlap between the current Agricultural Science and Biology syllabuses, while others pointed to the need to modernise the syllabus.

Several respondents made additional observations:

> *…the 1967 written syllabus is not reflective of what is now seen to be 'on the course'. (Ag Science teacher)*
>
> *In short, the examination has moved on, while the syllabus has become virtually obsolete (Ag Science teacher)*
>
> *(the current syllabus) fails to reflect the many changes in the sciences and technologies, environmental considerations, sustainability/biodiversity, societal changes since its inception in the early '70s. It also fails to take on board other considerations such as safety issues, the major dominance of the Irish food industry and the significance of EU and global economic policies. (Third-level lecturer)*
>
> *The LC Agricultural science course should provide an opportunity for students to explore agricultural topics that interest them, thereby encouraging and promoting further participation in the industry. (Farmer)*

	SD	D	N	A	SA	Rating Average	Response Count
Elements of the current syllabus are irrelevant in modern agricultural practices and processes.	2	9	3	20	13	3.70	47
The current syllabus provides adequate knowledge and skills for students' future life, study and work.	7	21	8	12	0	2.52	48
The current syllabus does not place enough emphasis on science investigation skills.	6	14	7	16	4	2.96	47
There is too much student practical coursework in the current syllabus.	10	20	6	4	8	2.58	48
The current syllabus does not pay enough attention to issues such as sustainability and the environmental impact of agriculture and food production.	1	1	8	18	19	4.13	47
The current syllabus provides appropriate and relevant knowledge and skills for those who wish to follow carers in the agriculture or food industries.	6	18	11	12	1	2.67	48
Ideally, students of LC Agricultural Science should also study LC Biology.	4	11	13	15	5	3.13	48

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

Table 1. Respondents' views on the current LC Agricultural Science syllabus

There is strong support for significant updating of the syllabus so that it reflects current agricultural practice and takes into consideration such aspects as safety, sustainability and the impact of agriculture on the environment.

> *The future sustainability of current farming practices in a world that is changing its approach to environmental matters needs more emphasis. (Third-level lecturer/researcher)*

There was support for the view that practical coursework and hands-on experience should receive greater reward in the examination. There is also support for ensuring that the syllabus provides proper scientific background for best practice and decisions taken on the farm.

- **Q.6 Elements of LC Agricultural Science**

Table 2 shows the views of respondents regarding the relevance of a range of topics in the study of LC Agricultural Science. While most of the suggested topics were seen as relevant or very relevant, with particular support for both crop and animal production and management, there was less support for farm economics. Some clarification was provided in the open responses.

> *…we consider farm economics to be important in the context of Agricultural Economics rather than the economics of the individual farm enterprise. (Third-level group, UCD)*
>
> *Farm economics in the context of agricultural economics (= the economy) rather than individual enterprise economics.*
>
> *Agriculture and sustainable development, access to markets (domestic and international) linked to farm economics. (WorldWise Global Schools)*

The majority of respondents saw practical experience on a farm as very relevant, but a number of comments expressed a note of caution.

> *a bigger emphasis could be placed on horticulture and also forestry, areas which generate employment and research possibilities (National Vegetable Society of Ireland)*
>
> *Students will encounter health and safety awareness through lab and field work and through routine teaching/learning activities...(rather than) such activities as operating farm machinery or handling livestock, etc. …Ag Science syllabus is not expected to deliver safe agricultural/farming practices. (Third-level lecturer)*

Relevance of listed topics for new specification	1	2	3	4	5	Rating Average	Response Count
Soils	0	1	8	6	33	4.48	48
Crop production and management	0	0	2	4	42	4.83	48
Animal production and management	0	0	2	4	40	4.83	46
Food processing and production	0	8	8	15	16	3.83	47
Farm economics	4	5	11	12	16	3.65	48
Environmental impact of agriculture	1	2	7	14	24	4.21	48
Energy use and energy conservation in agriculture	0	7	12	10	18	3.83	47
Practical experience on a farm	2	1	3	12	30	4.40	48
Health and safety in agriculture	1	0	8	10	28	4.36	47
The role of scientific research in agriculture	0	2	11	13	22	4.15	48

1= Not relevant; 5 = Very relevant

Table 2. Relevance in the context of LC Agricultural Science

Other topics which were suggested as being particularly relevant included: genetics, genetic engineering/genomics; bio-chemistry; importance of grass as a source of protein and energy; reading/awareness of current research publications; role of technology in agriculture; breeding programmes, disease, viruses, herd health management; careers in agriculture.

- **Q.7 The purpose(s) of LC Agricultural Science in the senior cycle**

Table 3 shows the level of agreement of respondents to a number of statements about the study of LC Agricultural Science. There is general agreement with the points made; the apparently low rating in respect of two statements can be attributed to the reverse coding that was used in both of these cases.

The study of LC Agricultural Science...	SD	D	N	A	SA	Rating Average	Response Count
... can contribute to improved management of agricultural resources for the economic and social benefit of humankind.	1	2	3	20	19	4.20	45
... provides an appropriate preparation for future study and careers in agriculture and food production, including research in these areas.	2	2	8	14	17	3.98	43
... does not contribute significantly to the development of the student's science practical and investigative skills.	15	13	5	8	3	2.34	44
... contributes to further developing the student's understanding of science processes.	0	2	12	17	13	3.93	44
... enables students to be ethical and socially-responsible citizens.	4	7	16	11	5	3.14	43
... does little to create awareness of environmental issues associated with agriculture and food production.	11	10	5	13	5	2.80	44
... can promote creativity and innovation.	1	9	8	15	11	3.59	44
... helps students to develop increased awareness of responsibility in both the scientific and social senses.	0	6	16	13	9	3.57	44

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

Table 3. Statements about the study of LC Agricultural Science

Respondents were invited to suggest other objectives which the study of LC Agricultural Science can or should provide. While there were significantly fewer comments here than for other questions, some suggestions were made: sustainable soil and land food security; sustainable farm practices; (preparation for) further participation in the industry.

- **Q.8 Looking to a new specification for LC Agricultural Science**

Table 4 lists a selection of topics that should feature in the new specification for LC Agricultural Science. There was noticeably strong agreement that students should develop an understanding of the role of science and technology in modern agriculture, that they should carry out practical laboratory and fieldwork, and that they should have the opportunity for specialised investigation/study in an area of interest to them.

Views on suggested features for new specification	SD	D	N	A	SA	Rating Average	Response Count
There should be a greater focus on developing science investigation skills than on farming practice.	4	14	8	7	9	3.07	42
Students should develop an understanding of the role of science and technology in modern agriculture.	0	0	0	20	22	4.52	42
Students should carry out practical laboratory and field work as part of their studies.	0	0	0	16	25	4.61	41
Considerations of sustainability and environmental impact should not feature strongly in the new specification.	15	12	7	4	4	2.29	42
All students of LC Agricultural Science should study a wide range of topics associated with agriculture and food production.	0	8	12	9	13	3.64	42
Students should have the opportunity for specialised investigation/study in an area of interest to them.	1	1	3	11	26	4.43	42
Economic considerations should be a significant feature of the new specification.	6	9	5	10	12	3.31	42
Health and safety in agricultural practice and food production should be given increased emphasis in the new specification.	1	1	2	22	16	4.21	42

SD = Strongly Disagree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

Table 4. Respondents' views on the new specification for LC Agricultural Science

There is strong support for the inclusion of sustainability and the environmental impact of agriculture in the new specification. Health and safety in agricultural practice and food production also received strong support, although there was some concern that this should not focus solely on health and safety legislation.

> *…students should have a general awareness of safety procedures and the inherent dangers associated with agricultural activities. (They) should not be required to know the legislation or acts associated with farm safety implementation. Methods used in the safe production of food could be included. (Ag Science teacher)*

In regard to health and safety, broad understanding of risks and awareness of prevention should be the aim. There should be no requirement to know legislation, etc. (Ag Science teacher)

A number of open responses referred to the risk of an ever-expanding syllabus and some suggestions were made that would help to overcome this.

There is an opportunity here to develop an exciting, dynamic syllabus… (that) should allow students to investigate areas of interest in a scientific manner. (Ag Science teacher)

The new LC Agricultural Science curriculum should include a wide range of topics associated with agriculture and food production: It is critical that topics should be integrated and not as stand-alone topics. It is worth considering teaching and examining Agricultural Science in a similar manner to Project Maths. Students should have the opportunity for specialised investigation/study in an area of interest to them. This should be facilitated through project work. (Third-level group, UCD)

The idea of farm/industry visits, adopted farms, etc. as is currently the practice, should continue to be encouraged. How wide a range of topics studied/included in the syllabus should be an agenda item for the Ag. Sc. Development Group. Options might also be considered to facilitate a greater student uptake depending on student interest, local resources, gender, etc. The processes of science should be the central focus. The various skills of planning, investigating, ... etc. could be exploited by "dealing with contexts, issues and problem solving drawn from a broad agenda ... " (ref. page 13 of the Background Paper). (Retired third-level lecturer)

- **Q.9 Assessment of LC Agricultural Science**

Table 5 overleaf shows the responses to listed features of assessment for certification. There was strong agreement that coursework should form part of the assessment for certification, that it should be externally moderated, and that an interview should be part of that assessment. The assessment of practical science investigation skills was viewed as more important than the assessment of practical agricultural skills. There was no consensus regarding the involvement of the teacher in the assessment of coursework, which is a feature of the current assessment arrangements in LC Agricultural Science.

Rating of listed features for assessment of new specification	1	2	3	4	5	Rating Average	Response Count
The assessment of coursework as part of the assessment for certification.	0	4	2	10	26	4.38	42
The assessment of coursework by the class teacher, based on detailed guidelines.	8	7	6	9	9	3.10	39
External moderation of coursework assessment.	2	0	4	7	27	4.43	40
An interview as part of the assessment for certification.	0	3	7	6	25	4.29	41
An examination of practical science investigation skills as part of the assessment for certification.	2	5	10	9	15	3.73	41
An examination of practical agricultural skills as part of the assessment for certification.	8	4	8	10	12	3.33	42

1= Low importance; 5 = High importance

Table 5. Important assessment features in the new Agricultural Science specification

The open responses reflected the importance ratings given to some of the features listed. Some respondents drew attention to difficulties with the current system, including concern in relation to the authenticity of some coursework being submitted for assessment. A number of suggestions were made for improving this situation under the new specification.

> *We are of the opinion that we owe our students a fair consistent and independent assessment of their work and not a moderation based on a random sample. Students need to feel that their work is valued, assessed fairly and without suspicion of bias. (Ag Science teacher)*

> *A project brief could be set with six choices, changing every year e.g. an investigation of a group of suckler weanlings on a farm from birth to 6 months; an investigation of all aspects of a construction of a new milking parlour; an investigation of free range versus industrial scale pig production; an investigation of a native hedgerow, over a year, including laying and coppicing; design and execute a front garden, including flowers; …. Each portfolio should include experiments appropriate to the project and photographic evidence; some may include models. (National Vegetable Society of Ireland)*

A level playing field needs to be created for all. Project work and individual research has its place but when the marks are going towards points for leaving cert it's not transparent enough. I think a case study question in the exam paper might be fair. (Ag Science teacher)

I would opt for the external monitor to be re-classified as an external assessor. In those circumstances the teacher would be a joint assessor and the final mark awarded would be the average of the External assessor's mark and the Teacher's mark. (Ag Science teacher)

At the moment the guidelines for marking coursework are very vague and subjective. The moderation of coursework is important but results of this process need to be fed back to teachers. (Ag Science teacher)

- **Q. 10 The brief for the review of LC Agricultural Science**

Respondents were referred to the proposed brief for development of a new specification in LC Agricultural Science the as set out in Section 4 of the Background Paper. Table 6 overleaf sets out their views on the importance of five listed features. In the open responses, a number of additional comments/suggestions were made.

There is a need to develop resources for the implementation of an inquiry based approach to the teaching of all aspects of the new Agricultural Science programme. (Ag Science teacher)

Skills: The skills currently listed for the science subjects of physics, chemistry, biology (NCCA 2012b on background paper) should be included. We do not agree with the inclusion of a number of the skills listed in the revised 2006 curriculum, several are generic or irrelevant… Note: ICT skills are also important. (Third-level group, UCD)

A diverse range of projects should be offered and including more Horticulture based ones could encourage greater uptake of the subject in larger urban areas. (National Vegetable Society of Ireland)

Rating of proposed features for new specification	1	2	3	4	5	Rating Average	Response Count
Embedding the Key Skills in the learning outcomes	0	1	4	14	21	4.38	40
Integrating the use of ICT into the learning outcomes	1	2	7	13	19	4.12	42
Allowing optional areas of study	2	3	3	7	26	4.27	41
Laboratory-based practical science activities	0	2	4	11	25	4.40	42
Field-based practical agricultural activities	0	1	5	9	27	4.48	42

1= Low importance; 5 = High importance

Table 6. Important features of the new specification for LC Agricultural Science

All of the listed features were rated as being of high importance, with particularly strong support for both laboratory and field-based practical activities and the inclusion of optional areas of study. Three-quarters of the respondents were of the view that the use of ICT should be integrated into the learning outcomes.

Appendix 3 contains a listing of possible topics which emerged from the online questionnaire responses, along with additional observations regarding the current syllabus and the new specification for LC Agricultural Science.

2.3 Student focus group meetings

- **Second-level student groups (see Appendix 2 for questions/notes)**

While the focus of the discussions in both school groups was the same, and many points of similar nature were made by the students, the fact that one group was in fifth year while the other was in sixth year meant that there was a greater focus on the forthcoming examination among the latter group. Both groups expressed the view that a 25% allocation to the practical coursework/project bore no relationship to the amount of time devoted to this part of the course. It was suggested by the students that 40% - 50% of the marks should go for this work. A further criticism arose in the timing of the project, which could really only allow them to follow through one full cycle (for either crops or animals) over the two years of the course.

Overall, the students chose the subject because of personal interest in agriculture and related activities. It is seen as interesting and practical, with the 'science' very much placed in context. There was an awareness that the syllabus was 'old' and that elements of modern agricultural practice were not being reflected in the current course. This was particularly so for the rural-based group who were mainly from a farming background. While some saw an overlap with LC Biology as an advantage, the extent of that overlap was not seen as significant by those students who current study both subjects (almost half of the group in one of the schools). More significance was attributed to the manner in which practical investigations and coursework were aligned with the 'theoretical' elements of the course.

In the initial meeting of each school group, students were asked to identify what elements/topics they would suggest could be removed from the course. There was no overall agreement on this, with some suggestions for removing the study of genetics. However, when probed a little more on this, the view was that this area of study should not be an abstract treatment, but should be done in the context of animal or plant production.

Some students were also of the view that the 'vague' nature of the headings in the current syllabus meant that it was difficult to know with certainty what was on the course and that they needed to rely on their teacher to give direction on this.

When asked to identify any new topics that should be included, the students offered a variety of possibilities:

- horses
- forestry
- fish farming
- food production
- health and safety in agriculture (but in a general sense, rather than regulations)
- the environment
- technology.

To accommodate the inclusion of these topics, a Core and Options structure was seen as being the most effective. This could also allow some degree of specialisation, particularly in the project.

In advance of the follow-up meeting, students were asked to consider specific points that arose in the first meeting and to offer deeper insights in relation to these at the second meeting. They were asked to consider what elements might be included in the Core and what could be put in the Options.

Although there was not unanimity in either group on this, it was suggested that the following areas should form the Core.

- Animals: cows, sheep, horses; breeds
- Main bodily functions in animals: heart, liver, digestion
- Housing and care of the animals; breeds
- Crops: grassland, cereal (5 or 6 named, e.g. barley, wheat), root crops, crop rotation
- Soil: fertiliser, pH, soil types, drainage, preparation and management, etc.

While there was agreement that each of these should be kept as broad as possible, there was also a need to provide detail so that everyone (students and teachers) could see what exactly was required to be studied (for the examination).

For the Options, the following areas were suggested.

- Animals: pigs, poultry
- Soil and crops: weeds, diseases
- Farm management, hygiene, safety

- Farm layout
- Machinery
- Traceability of product
- Agricultural economics

The students expressed the view that one or two options should be required, which would allow for some specialisation, yet not require all students to have a farm-based focus to their study. In reviewing these suggestions and comparing them to some of the points made in the initial meeting, it was suggested that topics such as environmental impact, energy, sustainability, technology, water and conservation should form interwoven topics that would connect the Core and Options.

- **Third-level student group**

As indicated earlier, this was a mixed group of students from different years at college who are following an Agricultural Science course. As with the second-level student groups, the focus of discussion was on their experience of LC Agricultural Science, although a small number of this group had not studied the subject for their Leaving Certificate. Many of them recalled their study in terms of what they had to do for the examination, and some recalled choosing the subject because it was 'an easy one for points'. One student took up the subject for the first time in a 'repeat' year programme.

There was no agreement on topics that they would suggest be removed from the course, but some offered the view that 'pure biology' elements could be reduced or treated in a way that related them more to agricultural practice and processes. It was suggested that an introduction to elements of bio-chemistry would have been of benefit. As with the second-level group, there was strong agreement that the proportion of examination marks awarded to practical coursework was too low. However, there was also an awareness that increased marks for coursework could mean even more 'cheating' in that aspect of the course.

Since the meeting with third-level students took place after the two sets of meetings with second-level students, and there would not be a similar follow-up meeting in this case, they were asked to express opinions on a Core and Options structure for a new specification in LC Agricultural Science. They could see a number of advantages to this, particularly the ability to include more modern topics and a level of specialisation. However, they felt that this might depend too much on the background and experience of the teacher. They identified horticulture as an area that could be included in order to broaden the engagement of students, particularly those who were not from traditional farming backgrounds.

As a final point of discussion, the students were asked to consider how greater awareness of study and careers in the agri-food area might be generated among second-level students. It was suggested that some inclusion of agriculture-related topics in JC Science and/or in Transition Year would be beneficial.

2.4 Agri Aware, ASA, HSA and ICOS submissions

Agri Aware (an independent body which provides the general public with information and education on the importance of agriculture and food to the Irish economy) and the Agricultural Science Association (the professional body for graduates in agriculture, horticulture, forestry and food science and technology) conducted surveys among their patrons/sponsors or members, each of which was based on the NCCA questionnaire. They carried out their own analysis of the responses in advance of submission to the NCCA. The following pages set out a summary of feedback provided by these two groups.

- **Agri Aware**

The main points emerging from the Agri Aware survey of their patrons/sponsors are represented in a set of tables in the following pages. These correspond to the six main questions in the questionnaire and the tables are followed by (i) a summary of comments regarding the scope of LC Agricultural Science in a new specification and (ii) an overall view of the purpose of Agricultural Science as an area of study at senior cycle.

Opinions on the current syllabus	**Number A / SA (N = 21)**
Irrelevant to modern agricultural practices	13
Provides adequate knowledge and skills for future life, study and work [*16 SD / D]	2
Not enough emphasis placed on science investigation skills	17
Too much practical coursework [*13 SD / D]	1
Not enough attention to sustainability, environmental impact, food production	20
Provides adequate knowledge/skills for future careers [*19 SD / D]	0
Ideally L.C. Agricultural Science students should also study L.C. Biology	15

A = Agree; SA = Strongly Agree; SD = Strongly Disagree; D = Disagree

In general, there was a negative view of the current LC Agricultural Science syllabus.

Syllabus topic	Number R / VR (N = 21)
Soils	18
Crop production and management	19
Animal production and management	21
Food processing and production	20
Farm Economics	20
Environmental impact of agriculture	19
Energy use and conservation in agriculture	20
Practical experience on a farm	19
Health and safety in agriculture	21
The role of scientific research in agriculture	20

R = Relevant; VR = Very Relevant

All of the listed topics were seen as relevant or very relevant to the study of LC Agricultural Science.

2006 Draft syllabus for LC Agricultural Science	Number A / SA (N = 21)
Can contribute to improved management of agricultural resources for social and economic benefit of humankind	18
Provides appropriate preparation for future study/career in agriculture and food production	19
Does not contribute to student development of science practical and investigative skills [14 SD / D]	1
Contributes to further developing the students understanding of science processes	18
Enables students to be ethical and socially responsible	12
Does little to create awareness of environmental issues associated with agriculture and food [11 SD / D]	7
Can promote creativity and innovation	13
Helps students to develop increased awareness of responsibility in both science and social senses	12

A = Agree; SA = Strongly Agree; SD = Strongly Disagree; D = Disagree

There was generally a positive view of the syllabus that was drafted in 2006.

Topics in the new specification for LC Agricultural Science	Number A / SA (N = 21)
Greater focus on science investigation skills than farming practices [7 SD / D]	10
Should develop understanding of role of science and technology	21
Practical laboratory and field work as part of studies	19
Sustainability and environmental impact should not feature strongly [17 SD / D]	2
Students should study a wide range of topics associated with agriculture and food production	18
Students should have the opportunity for specialised study in area of interest	17
Economic considerations should be a significant feature	19
Health and safety in agricultural practice and food production should be given increased emphasis	20

A = Agree; SA = Strongly Agree; SD = Strongly Disagree; D = Disagree

Assessment of the new specification	Number 4 / 5 (N = 21)
Assessment of coursework as part of assessment for certification	18
Assessment of coursework by the class teacher, based on detailed guidelines	16
External moderation of coursework	16
Interview as part of assessment for certification [2 LI]	11
Examination of practical science investigation skills as part of assessment for certification [2 LI]	17
Examination of practical agricultural skills as part of assessment for certification [3 LI]	13

1 = Low Importance; 5 = High Importance

Aspects of new specification for LC Agricultural Science	Number 4 / 5 (N = 21)
Embedding key skills in learning outcomes	17
Integrated use of ICT in learning outcomes	15
Allowing optional areas of study **2 respondents stated that this is of low importance*	12
Laboratory-based practical science activities **2 respondents stated that this is of low importance*	16
Field-based practical agricultural activities	18

1 = Low Importance; 5 = High Importance

Although there was strong support in a previous question for students having the opportunity for specialised study in an area of interest to them, there seems to be less importance accorded here to including optional areas of study. A number of topics were seen as being important, but not covered in the current syllabus:

genetics	tillage	energy
policy	export markets	sustainability
technology	health and safety/biosecurity	disease
animal production systems	animal welfare	grassland
equine		

Topics identified by agricultural/food sector

Each of the agri/food sectors was asked to identify important topics which, in their view, should be included in the study of LC Agricultural Science. These are shown in the tables overleaf.

Dairy	**Meat**	**Health and Safety**
Efficiency	Grass/grassland management	Animal welfare
Farm systems	Genetics	Food security
Market outlets	Profitability at farm level	Food safety
Diet and lifestyle	Sustainability	ICT
Soils	Environment	Laboratory
Animal welfare	Farm management	Field-based study
Genetics	ICT	Genetics
Food origin	Quality assurance	Economics
Environment	Retail spec - Beef and Lamb	Environment
Technology	Farm building design	Sustainability
Health and Safety	Industry speakers	Animal health
Marketing of produce	Economics	Interactive farm enterprises
Economics/economy	Meat quality	Climate change
Crop husbandry	Meat processing	Grassland
Animal husbandry	Field trips/farm walks	Practical skills
Policies/CAP/2025	Farm safety/health and safety	Market outlets
Consumer confidence/perception		
Banking, Education	**Fertiliser Industry**	**Equine**
Farm economics	Soils	Best in the world
Practical experience on farm	Fertilisers	Contribution to economy
Sustainability	Trace elements	Heritage
Energy conservation	Animal nutrition	Engrained
Environment	Crop nutrition	Breeding
Food safety	Industrial chemicals	Welfare
Food security	50% written and 50% practical assessment	Foals
Role of scientific research	Soils	Farm visits
Grass/grassland management	Follow projects to industry (farm to fork)	Thoroughbreds/Racing

Overall, the priority areas for industry were seen as:

Farm safety	Equine
Sustainability	Industry involvement
Environment	Assessment (written v practical)
Grass	Farm walks
Economics	Role of scientific research
Genetics	Market outlets
Animal welfare	Meat quality/specification
Food safety	ICT
Food security	CAP/EU policy
Food origin	Farm management
Profitability at farm level	Industrial chemicals
	Soils

The following points were noted in relation to the scope of LC Agricultural Science

- There needs to be a clear industry message in order to integrate with modern agricultural practices
- There should be an opportunity for students to get involved in the agri-food industry via the practical element
- Equine should be included in the new specification
- The new specification must reach an appropriate standard and stand the test of time
- Students should be encouraged to study Agricultural Science so that they can go on to forge careers as industry leaders
- There is not currently enough focus on sustainability, the environment and food production
- Farm safety must be included on the course
- The new specification must focus on Agricultural Science as a science subject
- It must entice future farmers to study Agricultural Science at second level
- Health and safety and other areas should be covered during Transition Year (develop modules) as there is more time available
- There must be options for the farm to come to the classroom through the use of ICT
- It is critical not to reduce the depth of the subject. The new specification needs a core and options that may allow students an opportunity for students to specialise in specific areas
- Agricultural Science must be given the same importance as subjects such as languages, where orals are provided for. The practical/project element of the course allows students who are not academically minded to excel.

The following points were noted in relation to the purpose of LC Agricultural Science.

- Equipping students with relevant information to prepare for third-level study in this area
- Preparing future farmers for further study and work on the farm
- Providing students with knowledge to go forward to study further; there is a need to train future industry leaders by encouraging them to study the subject
- The specification needs to be on par with other Leaving Certificate subjects; there must be mechanisms that will allow students to shine
- Practical work is essential to the study of Agricultural Science; a farm visit is not adequate as the subject is both practical and theory-based.

- **The Agricultural Science Association**

The ASA conducted a survey among its members in January 2015, using a copy of the NCCA online questionnaire. Their submission is reproduced below, using the same headings as in the online questionnaire.

Introduction

The ASA (Agricultural Science Association) is the professional body for graduates in agriculture, horticulture, forestry and food science and technology. Its 1,800 members operate across the entire industry, covering government departments, research, advisory, education and training, agri-business, rural organisations and the media.

Founded in 1942, the ASA is recognised by the government as a negotiating body and has played an active role in policy development and in ensuring that the expertise of its members is utilised fully in the national interest and that the professional interest of its members are promoted and protected.

Members of the ASA have been to the forefront in guiding change and helping the industry to increase productivity and innovation and to enhance Ireland's reputation as a producer of quality, safe food.

In their diverse roles, members are in contact with every farmer, food processor, input and service provider as well as students at all levels of the education cycle thereby giving the ASA a unique feel for the pulse of the agri-food economy and rural Ireland.

The ASA has considerable interest in the shape of the agricultural industry into the future and the people working in it. ASA members are committed to the development of a profitable, sustainable and competitive agri-food sector to meet current and future needs. The ASA welcomes the

opportunity to make a submission during the consultation process on the Leaving Certificate Agricultural Science Syllabus.

As part of our submission process, the ASA conducted a survey of our members based on the NCCA survey. We have based our submission on the responses of our members in that survey.

Extent to which the current Leaving Certificate Agricultural Science Syllabus has delivered

In terms of assessing the delivery of the current syllabus and how improvement can be made for the new syllabus, ASA members consider the following as important (whereby the majority of respondents agreed/strongly agreed):

1. Elements of the current syllabus are irrelevant in modern agricultural practices and processes.
2. The current syllabus does not pay enough attention to issues such as sustainability and the environmental impact of agriculture and food production.
3. The current syllabus does not place enough emphasis on science investigation skills.
4. Ideally, students of LC Agricultural Science should also study LC Biology.

Relevance of the study of various elements, in the context of Leaving Certificate Agricultural Science

The ASA recognises that the development of students studying Agricultural Science for the Leaving Certificate is very important and that certain elements must be covered to give them a good grounding in Agricultural Science.

The ASA respondents consider the following elements to be relevant/very relevant to the Leaving Certificate Agricultural Science syllabus, in the following order:

1. Soils
2. Crop production and management
3. Animal production and management
4. Health and safety in agriculture
5. Environmental impact of agriculture
6. Farm economics
7. The role of scientific research in agriculture
8. Energy use and energy conservation in agriculture
9. Food processing and production
10. Practical experience on a farm

The study of Leaving Certificate Agricultural Science

Ireland's agri-food sector primarily competes on the international food market and the ability to maintain our competitive advantage, based on our education of our young people interested in the area of Agricultural Science, is paramount. The ASA respondents mainly strongly agree that the study of Leaving Certificate Agricultural Science:

1. provides an appropriate preparation for future study and careers in agriculture and food production, including research in these areas.
2. can contribute to improved management of agricultural resources for the economic and social benefit of humankind.

The ASA respondents mainly agree with the following. That the study of Leaving Certificate Agricultural Science:

1. contributes to further developing the student's understanding of science processes.
2. provides an appropriate preparation for future study and careers in agriculture and food production, including research in these areas.
3. can contribute to improved management of agricultural resources for the economic and social benefit of humankind.

The ASA respondents mainly disagree with the following. That the study of Leaving Certificate Agricultural Science:

1. does not contribute significantly to the development of the student's science practical and investigative skills.
2. does little to create awareness of environmental issues associated with agriculture and food production.

In relation to the new specification for Leaving Certificate Agricultural Science

ASA members mainly agree / strongly agree

1. Students should develop an understanding of the role of science and technology in modern agriculture.
2. Students should carry out practical laboratory and field work as part of their studies.
3. Health and safety in agricultural practice and food production should be given increased emphasis in the new specification.
4. Students should have the opportunity for specialised investigation/study in an area of interest to them.
5. All students of LC Agricultural Science should study a wide range of topics associated with agriculture and food production.
6. Economic considerations should be a significant feature of the new specification.

ASA members mainly agree

1. There should be a greater focus on developing science investigation skills than on farming practice.

ASA members mainly disagree / strongly disagree

2. Considerations of sustainability and environmental impact should not feature strongly in the new specification.

In relation to assessment for certification

ASA members mainly considered the following of highest importance:

1. The assessment of coursework as part of the assessment for certification. (mainly responded 4 and 5 level of importance)
2. External moderation of coursework assessment. (mainly responded 3, 4 and 5 level of importance, where level 4 had the highest number of respondents)
3. An examination of practical science investigation skills as part of the assessment for certification. (mainly responded 3, 4 and 5 level of importance, where level 4 had the highest number of respondents)
4. The assessment of coursework by the class teacher, based on detailed guidelines. (mainly responded 2, 3, 4 and 5 level of importance, where level 4 had the highest number of respondents)
5. An interview as part of the assessment for certification.
6. An examination of practical agricultural skills as part of the assessment for certification.

Level of importance that should be attached to each in developing the new specification in LC Agricultural Science

ASA members mainly considered the following of highest importance

1. Field-based practical agricultural activities

ASA members mainly considered the following of importance level 3 and 4

2. Embedding the Key Skills in the learning outcomes
3. Integrating the use of ICT into the learning outcomes
4. Laboratory-based practical science activities

ASA members mainly considered the following of importance level 2

1. Allowing optional areas of study

Conclusion

As the agriculture and food industry has targets to grow output in the main sectors by up to 50% along with growing our food exports from €10bn to €12bn over the next 5 years, Ireland is building a world class food economy. Therefore, the views expressed above by our members are very much aligned with the strategic objectives set out by Food Harvest 2020. There is still strong feeling that the syllabus is science-based and focusses on the key areas of soils, crops and animal production. Practical experience is also a key area of focus.

ASA members feel that the role of Leaving Certificate Agricultural Science should give students a flavour for future study in the area. At the very outset it must create an interest for them in the area. The existing Agricultural Science syllabus requires modification to include more pertinent topics to modern agriculture practices and processes. A broader range of topics associated with agriculture and food production is suggested, with emphasis on science investigation skills and practical laboratory and field work where relevant.

Some further suggestions

Limit the number of practical investigations on the course, similar to the biology. Place a higher weighting on the practical assessment; at the moment it accounts for 25%. Maybe 40% for the practical and 60% for the written and continue with external moderation (this will follow through from the current proposals for the new Junior Cert programme of 40:60).

Equine should be included on the Leaving Certificate Agricultural Science syllabus, as it is a significant contributor to the economy.

Have the most recent and up to date agricultural scientific advancements, in animal husbandry, crop husbandry, genetics and the environment, and have optional areas.

Incorporate all these proposals using ICT and have key skills in these learning outcomes.

- **The Health and Safety Authority**

The HSA welcomed the acknowledgement that health and safety aspects associated with agriculture and food production were seen as important.

> *We would like to see health and safety embedded on the Leaving Certificate Agricultural Science syllabus and a clear set of learning outcomes developed around safety in particular 'hazard identification' and 'risk assessment'. It is really important that students learn how to apply this knowledge to any given work situation or work activity. Students should also be given the opportunity to learn about farm safety in general, and accident causation and prevention.*

The agricultural sector has a high labour input where farmers and workers perform a wide range of hazardous tasks. Practices adopted by workers are a key determinant to securing health and safety. The following key areas were identified for inclusion on the syllabus:

- The impact of agricultural activities and processes on the person
- Risk assessment and controls
- Accident prevention and the Code of Practice for Preventing Injury and Occupational Ill Health in Agriculture.

> *Students should be taught about the Code of Practice and associated Risk Assessment Document. Through learning about risk assessment and controls, students will have the benefit of becoming safety conscious individuals and will develop healthy attitudes towards accident prevention.*

In their submission, they indicated how and where knowledge, understanding, activities and skills could be included which provide for increased awareness and appreciation of the risks and preventative measures which encourage those working in agriculture to think safely and to farm safely.

- **The Irish Co-operative Organisation Society**

The ICOS submission proposed the inclusion in the new specification of the role of co-operatives and their importance to producers in Irish Agri/Forestry industry. They view the existing co-operatives in the agri-food industry – and new co-operatives to be formed in sectors like forestry, food, renewable energy and community-based projects – as extremely important in ensuring a sustainable and resilient agricultural community in the years ahead.

They suggest that an overview of co-operatives would give students an insight into their current roles and also the strengths, weaknesses, opportunities and threats in what is now a global market place for food. The history of the co-operative model, its particular application to agriculture and how it has adapted to market changes over the past century, the economics justification for co-operatives and their social and developmental role in the Irish agricultural sector are other aspects that could be incorporated into the new specification. ICOS see many opportunities for rural Ireland to take advantage of the co-operative model in new sectors such as forestry, renewable energy, artisan foods and rural tourism. The adoption of these models can create employment, sustainable businesses and widespread rural prosperity. Our students studying agricultural science need to have some understanding of how Irish family farms can compete and survive in a global market place

2.5 Messages from the consultation

There is consensus that the Agricultural Science specification needs to reflect current practice in agriculture, incorporating such areas of study as sustainability, energy, environmental impact, the role of science and technology in agriculture, the use of ICT, and the management of agricultural resources for economic and social benefit. There is strong support for student engagement in practical lab and field-based activities and for an increased assessment weighting for practical coursework. While areas such as health and safety, the economic aspects of agricultural production, its contribution to food production, and policy and legislation related to agriculture are also seen as requiring inclusion, it is seen as important that this would be done in context rather than as isolated elements of theoretical study.

Given the wide range of additional topics that have been suggested for inclusion in the new specification, consideration should be given to a Core and Options structure which would also allow for an element of specialisation in an area of relevance or personal interest for students.

3. Progressing the work of specification development

The LC Agricultural Science Development group has met to consider the initial feedback from the consultation process. While there was a general welcome for the findings, it was also recognised that a number of issues will need to be addressed during the work of specification development. Among these is the feasibility of including additional topics and whether this may have the effect of broadening the course to such an extent that individual topics are not dealt with to any great depth. The extension of topics to include aspects such as horticulture, forestry, food production (in a farm-to-fork approach) and food sustainability will have implications for the nature and purpose of the subject.

There was strong support in the consultation feedback for allowing an element of specialisation so that students could focus on an aspect of study that was of particular relevance or interest to them. Suggestions were made for a Core and Options structure to the specification which might accommodate this. However, consideration will need to be given to the implications of this for the assessment of the subject.

There was general agreement that the brief set out in the Background Paper for the development of a new specification for LC Agricultural Science was comprehensive, with some respondents welcoming the aims and objectives as set out in the 2006 draft syllabus. The Development Group will need to consider how best to provide for the development scientific reasoning, appropriate investigation and science process skills in the context of agricultural practice.

3.1 Assessment of the new specification

In all stages of the consultation processes, there was a strongly held view that practical coursework should remain as an important feature of the study of LC Agricultural Science. Students and teachers expressed concern that the extensive work involved in undertaking and reporting on the student practical coursework/project was not being adequately rewarded in the examination. There was very strong support for increasing the proportion of marks awarded for this from its current level of 25%, with suggestions generally lying in the 30% – 40 % range.

While there was recognition that the teacher currently plays a central role in assessment of student coursework, there was also strong support for this assessment being carried out by an external assessor, and particularly that each student should be assessed/interviewed as part of this process to ensure fair and equal treatment of all candidates. The current process of external monitoring/moderation is not seen as satisfactory by respondents to the NCCA online questionnaire and this was also reflected in the student focus group meetings.

4. Conclusion

The consultation process engaged with a wide range of stakeholders and there was notable consistency in much of the feedback. It is widely recognised that the current syllabus needs significant work to modernise the study of Agricultural Science, particularly in respect of current agricultural practice and issues associated with environmental impact and sustainability. The role of science and technology in underpinning agricultural practice also needs to be embedded in the new specification. While the extent of overlap with LC Biology was reduced when that syllabus was revised in 2002, there is support for dealing with the 'biology' aspects of the subject in an agricultural context rather than in an abstract or 'pure' biological one.

The purposes for which LC Agricultural Science was introduced will need to be revisited in light of developments in agriculture and the significant role that it plays in the food economy, as well as the increasing relevance of scientific and technological developments and the opportunities for careers in the agricultural and food industries as well as in agricultural and scientific research.

As has been the case in the past, issues associated with the assessment of LC Agricultural Science will need careful consideration. The practical and investigative elements of the course play a significant part in attracting students to the subject and there is a strong sense that the reward for the significant investment of time and effort involved needs to be increased. This will bring its own challenges, not least the need to ensure the integrity of the assessment process.

Appendix 1: Online questionnaire

Introduction

The aim of this consultation questionnaire is to hear the open and honest views of teachers/parents/students and interested parties on the Background Paper and Brief for the Review of Leaving Certificate Agricultural Science, which can be downloaded here. The generation of the Background Paper and Brief is the first stage of the curriculum and assessment development process. It provides a background and context for the development of a new specification for LC Agricultural Science. The consultation will involve gathering feedback through this survey and through focus group meetings in the period Nov-Dec 2014. The NCCA would greatly appreciate your feedback. This feedback will inform the work of the Agricultural Science Development Group. Please complete this questionnaire as fully as possible, but feel free to skip any item that is not relevant to you. The questionnaire is divided into six parts: 1. Participant's details; 2. The scope of LC Agricultural Science; 3. Purpose(s) of Agricultural Science in senior cycle; 4. Science investigation skills; 5. Assessment of LC Agricultural Science; 6. The brief for the review of LC Agricultural Science.

1. Participant's details

***1. I am responding as a ...**

- ◯ LC Agricultural Science teacher
- ◯ Other science subject teacher (Post-primary)
- ◯ Non-science teacher (Post-primary)
- ◯ Primary teacher
- ◯ Principal/ Deputy Principal (Post-primary)
- ◯ Principal/ Deputy Principal (Primary)
- ◯ Other
- ◯ Second level student
- ◯ Third level student
- ◯ Parent/ Guardian
- ◯ Teacher educator
- ◯ Pre-service Teacher
- ◯ Third level lecturer/researcher

Other (please specify)

2. If you are responding on behalf of a group/organisation, please indicate below whether the submission may be made publicly available and/or whether the group/organisation may be named in the consultation report as a contributor.

	Yes	No
My group/organisation agrees to this submission being made available.	◯	◯
My group/organisation agrees to be named as a contributor to the consultation.	◯	◯

Please provide the name of the group/organisation on whose behalf you are responding.

3. School type (if applicable)

- ◯ Voluntary secondary school
- ◯ Community school
- ◯ Comprehensive school
- ◯ Vocational school
- ◯ Community college
- ◯ Other

Other (please specify)

4. You can provide your name and email address to enable us to follow-up on particular issues that you may identify. However, your survey data will be anonymised and we will ensure that no views which you articulate will be attributed to you personally or be reported in any way that would allow you to be identified.

Name _____

Email address _____

2. The scope of LC Agricultural Science

Information on the current syllabus and take-up of LC Agricultural Science is provided in the Introduction section of the Background Paper (pages 1-2).
The current syllabus is included in Appendix 1 of the Background Paper (pages 21-25).
Guidelines for Teachers in the practical coursework assessment of LC Agricultural Science are contained in Appendix 2 (pages 26-29)

5. Please indicate your level of agreement with each of the following statements.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Elements of the current syllabus are irrelevant in modern agricultural practices and processes.	◯	◯	◯	◯	◯
The current syllabus provides adequate knowledge and skills for students' future life, study and work.	◯	◯	◯	◯	◯
The current syllabus does not place enough emphasis on science investigation skills.	◯	◯	◯	◯	◯
There is too much student practical coursework in the current syllabus.	◯	◯	◯	◯	◯
The current syllabus does not pay enough attention to issues such as sustainability and the environmental impact of agriculture and food production.	◯	◯	◯	◯	◯
The current syllabus provides appropriate and relevant knowledge and skills for those who wish to follow carers in the agriculture or food industries.	◯	◯	◯	◯	◯
Ideally, students of LC Agricultural Science should also study LC Biology.	◯	◯	◯	◯	◯

If you wish, please outline any additional views you may have about LC Agricultural Science.

6. Please indicate how relevant you consider the study of each of the following elements in the context of LC Agricultural Science (1 = not relevant; 5 = very relevant).

	1	2	3	4	5
soils	◯	◯	◯	◯	◯
crop production and management	◯	◯	◯	◯	◯
animal production and management	◯	◯	◯	◯	◯
food processing and production	◯	◯	◯	◯	◯
farm economics	◯	◯	◯	◯	◯
environmental impact of agriculture	◯	◯	◯	◯	◯
energy use and energy conservation in agriculture	◯	◯	◯	◯	◯
practical experience on a farm	◯	◯	◯	◯	◯
health and safety in agriculture	◯	◯	◯	◯	◯
the role of scientific research in agriculture	◯	◯	◯	◯	◯

Please list any other topics which you think are particularly relevant.

3. Purpose(s) of Agricultural Science in the senior cycle

A draft revised syllabus (2006) for LC Agricultural Science set out the rationale, aims and objectives of the subject (see pages 31-34 of the Background Paper).

7. Please respond to the following statements showing your level of agreement.

The study of LC Agricultural Science ...

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
... can contribute to improved management of agricultural resources for the economic and social benefit of humankind.	◯	◯	◯	◯	◯
... provides an appropriate preparation for future study and careers in agriculture and food production, including research in these areas.	◯	◯	◯	◯	◯
... does not contribute significantly to the development of the student's science practical and investigative skills.	◯	◯	◯	◯	◯
... contributes to further developing the student's understanding of science processes.	◯	◯	◯	◯	◯
... enables students to be ethical and socially-responsible citizens.	◯	◯	◯	◯	◯
... does little to create awareness of environmental issues associated with agriculture and food production.	◯	◯	◯	◯	◯
... can promote creativity and innovation.	◯	◯	◯	◯	◯
... helps students to develop increased awareness of responsibility in both the scientific and social senses.	◯	◯	◯	◯	◯

If there are other objectives which you think the study of Agricultural Science can or should promote, please state them here.

4. Science investigation skills

Section 3 of the Background Paper (pages 16-18) presents a number of issues concerning the nature of LC Agricultural Science and the emphasis to be given to the development of science investigation skills.

8. Please indicate your level of agreement with each of the following statements in relation to the new specification for LC Agricultural Science.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
There should be a greater focus on developing science investigation skills than on farming practice.	◯	◯	◯	◯	◯
Students should develop an understanding of the role of science and technology in modern agriculture.	◯	◯	◯	◯	◯
Students should carry out practical laboratory and field work as part of their studies.	◯	◯	◯	◯	◯
Considerations of sustainability and environmental impact should not feature strongly in the new specification.	◯	◯	◯	◯	◯
All students of LC Agricultural Science should study a wide range of topics associated with agriculture and food production.	◯	◯	◯	◯	◯
Students should have the opportunity for specialised investigation/study in an area of interest to them.	◯	◯	◯	◯	◯
Economic considerations should be a significant feature of the new specification.	◯	◯	◯	◯	◯
Health and safety in agricultural practice and food production should be given increased emphasis in the new specification.	◯	◯	◯	◯	◯

Use the space below for any additional observations you may wish to make regarding the nature of LC Agricultural Science.

5. Assessment of LC Agricultural Science

The new specification will set out details for the assessment of LC Agricultural Science. While the assessment should reflect and reinforce the practical nature of the subject, it must also accommodate its potentially diverse aspects. The current assessment model for LC Agricultural Science, comprising practical coursework which is assessed in school and a terminal written examination, has developed over time and may have benefits for the new specification.

9. In relation to assessment for certification, please indicate the level of importance you would associate with each of the following, where 1 = of low importance and 5 = of high importance.

	1	2	3	4	5
The assessment of coursework as part of the assessment for certification.	◯	◯	◯	◯	◯
The assessment of coursework by the class teacher, based on detailed guidelines.	◯	◯	◯	◯	◯
External moderation of coursework assessment.	◯	◯	◯	◯	◯
An interview as part of the assessment for certification.	◯	◯	◯	◯	◯
An examination of practical science investigation skills as part of the assessment for certification.	◯	◯	◯	◯	◯
An examination of practical agricultural skills as part of the assessment for certification.	◯	◯	◯	◯	◯

Please use the space below for any additional views you may have on the assessment for certification of the new specification for LC Agricultural Science.

6. Brief for the review of LC Agricultural Science

Section 4 of the Background Paper (page 19) sets out the proposed brief for the review and the development of a new specification in LC Agricultural Science.

10. Please respond to the following statements to indicate the level of importance that should be attached to each in developing the new specification in LC Agricultural Science (1 = of low importance; 5 = of high importance).

	1	2	3	4	5
Embedding the Key Skills in the learning outcomes	◯	◯	◯	◯	◯
Integrating the use of ICT into the learning outcomes	◯	◯	◯	◯	◯
Allowing optional areas of study	◯	◯	◯	◯	◯
Laboratory-based practical science activities	◯	◯	◯	◯	◯
Field-based practical agricultural activities	◯	◯	◯	◯	◯

You may wish to add further comments in relation to the brief. If so, please use the space below.

Thank you

Thank you for taking the time to complete this questionnaire. Please do not forget to press 'Submit' when you are finished.

If you have completed a hard copy of this questionnaire, please return it to:

LC Agricultural Science Background Paper Consultation,
NCCA,
35 Fitzwilliam Square,
Dublin 2.

A summary of the findings will be published on the NCCA website at the end of the consultation.

Appendix 2: Notes and questions for student focus groups

Introduction: Who we are, what we do.

The student voice

- Engaging with students to hear their voice as part of the development process
- Opportunities for students to have their voice heard
- Expectations of their voice making a difference

The student experience of Ag Science

Working towards a shared understanding about what a specification/syllabus is for and the work currently being undertaken now to revise Agricultural Science.

So what is a ***specification***? In a nutshell, it is the document that describes what the important learning is – knowledge, skills and attitudes, what students will know and be able to do as a result of studying Agricultural Science. It also explains how students will be asked to show what they have learned (assessment).

- Why did you choose to study Agricultural Science in senior cycle?
- What do you like/not like about the subject?
- If you had your way, what would you get rid of? What would you keep?
- What would you like to see in Agricultural Science that would make it exciting?
- How many of you are also studying Biology?
- Is there much of an overlap between the two subjects?
- Is this learning overlap helpful/unhelpful?
- What other ideas do you have for changes to the subject?
- Is there was anything that you would like to ask us about this process?

Assessment

Currently, Ag Science is assessed in two ways: a written exam paper (75%) and practical coursework (25%). In your practical coursework you show the examiner what you have learnt in Agricultural Science and can be interviewed about this work.

- What do you like about the two ways in which you are assessed?
- What do you not like?
- What changes would you like to see? What effect would these changes have?

Next session

A second meeting is planned, with an opportunity for this group to meet in between (facilitated by the teacher). We will identify particular points from today's discussion that we would like to discuss in more detail at the second meeting, and ask you to focus on these points in your own discussions, before you meet us again.

Appendix 3: List of topics; comments on the specification

Across all responses received, a wide range of possible topics for inclusion in the new specification for LC Agricultural Science is given below.

Possible topics

- Milk production
- Breeding programme; dry cow management
- Disease/viruses; herd health management
- Grass management
- Food production – supply chain
- Economics in a national/international context
- Industry-based study
- Horticulture and forestry; horticulture-based project
- Crop and animal production sciences
- Animal husbandry
- Science and technology
- Practical lab and field work
- Health and Safety – operating machinery/equipment
- Sustainability of farming practices in a changing environment
- Soil/land and sustainable food security
- Use of technology in agriculture
- Tillage, beef, dairy and sheep research publications should be studied
- Health and safety – general treatment in r elation to agriculture
- Food production – farm and industry levels
- Environmental impact of agriculture/farming
- Fertilisers/Soil management
- Plant and animal identification
- Genetics
- Artificial insemination/genetic engineering
- Genomics

General comments

While some comments/quotes from the responses to the online questionnaire have been included in the main body of the report, the following is a list of points made by the largest group to submit open responses, Agricultural Science teachers.

- All students to be assessed; no sampling of students for assessment; external examiners to perform assessment
- Practical work assessed at 40%; too much work required for only 25% of marks
- No knowledge of legislation should be required
- Current list of experiments is exhaustive, a concise list of experiments is preferable
- Syllabus needs to be broader to appeal to everyone
- Soil science needs to be more appealing, perhaps more lab work with soil required
- The Agricultural Science exam has moved on but not the syllabus
- Emphasis should be on modern crops
- Students should be aware of scientific background of decisions taken on a farm
- Students should learn best practice on a chosen enterprise
- Current syllabus headings are very vague
- Practical work that can be completed in urban schools as well as rural schools

Appendix 4: List of Agri Aware patron organisations

Patron groups contributing to the Agri Aware feedback on the consultation

AIB

ASA

Aurivo Co-op

Ballydoyle Racing

Coorevin Farm

Department of Agriculture

EMBRACE

ESB networks

Farm policy manager (independent)

FBD

FRS networks

Glanbia

Goulding's Fertiliser

Horse Racing Ireland

IFA

IHFA

Kepak Group

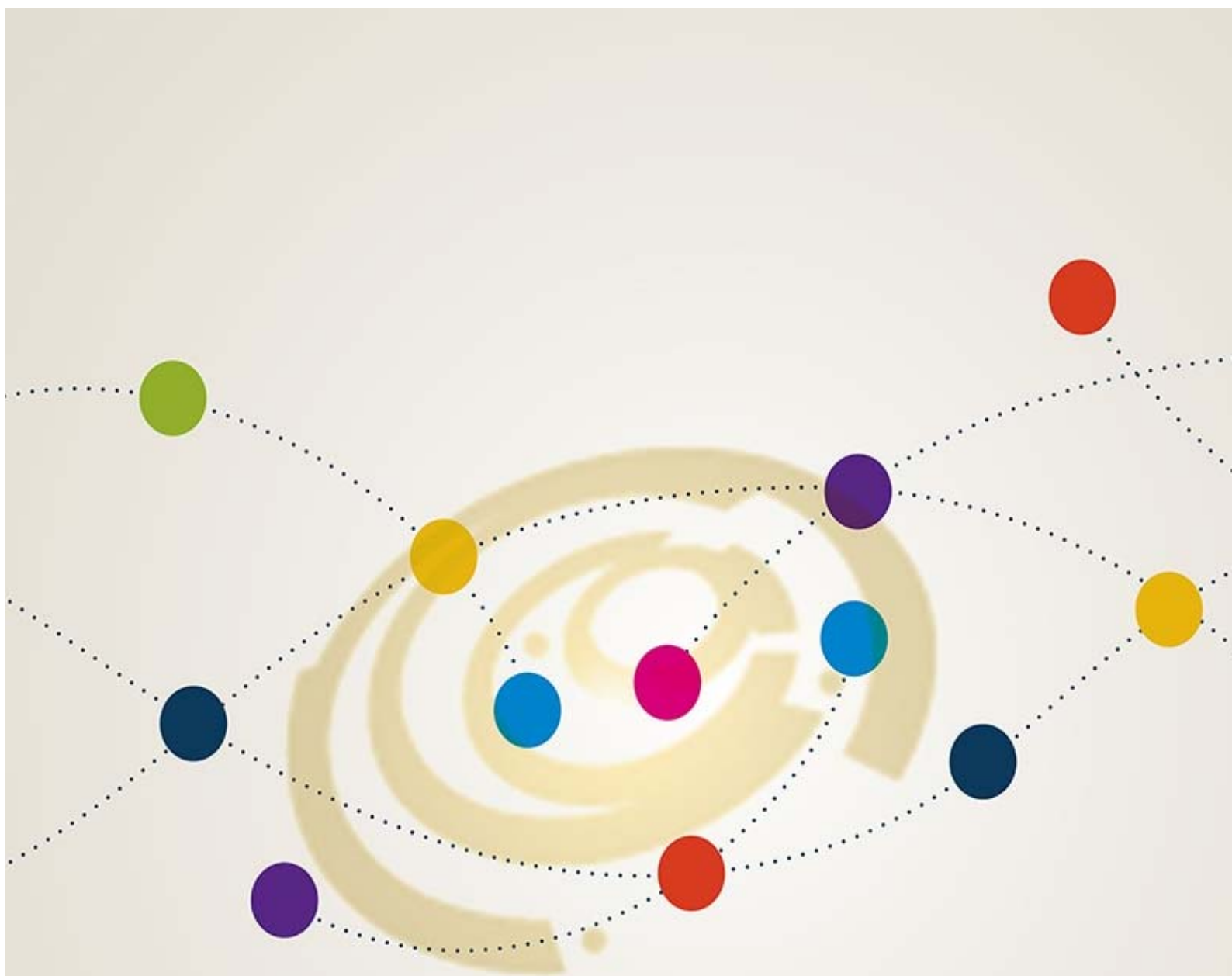
Kerry Group

National Dairy Council

Retired former Head of Agriculture at DG Environmental EU Commission

Truly Irish Country Foods

Wordlwise Global Schools



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