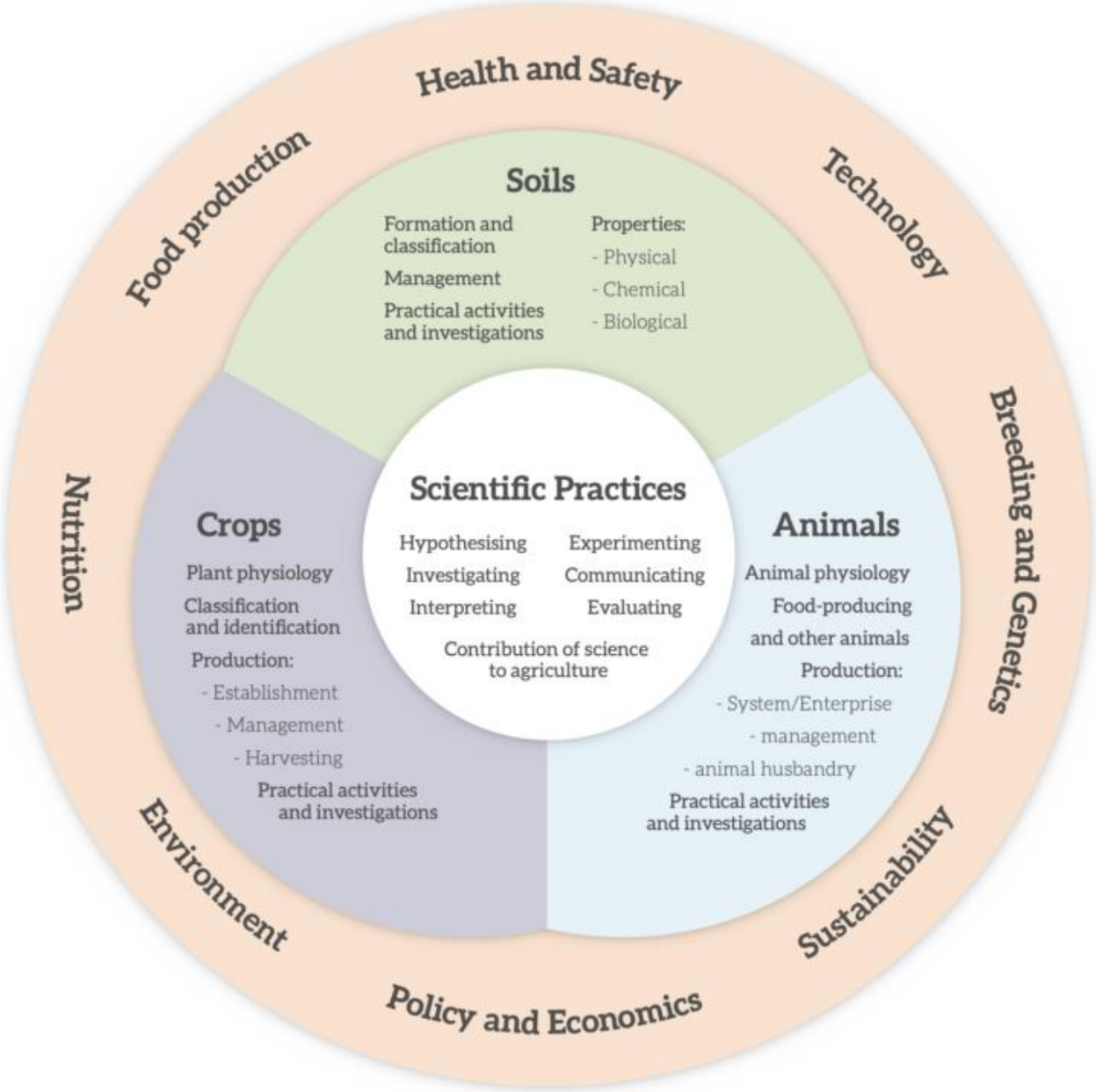
LEAVING CERT AGRICULTURAL SCIENCE

ABOUT AGRICULTURAL SCIENCE

- The ***Leaving Certificate Agricultural Science*** curriculum is designed to provide pupils with the necessary skills, practical experience and knowledge in a range of agricultural and scientific principles.
- The subject involves the study of the science and technology underlying the principles and practices of agriculture in Ireland.
- It aims to develop knowledge, skills and attitudes that promote the sustainability of agricultural resources, and places emphasis on the managed use of these resources.

- It is a broad but interesting course, which examines the principal farming enterprises in Ireland (dairy, beef, sheep, pig, tillage crops, potatoes, forestry, poultry) while also giving a deep understanding of the science underpinning these enterprises.
- Plants and animal types associated with agriculture are studied, and investigations are undertaken into such aspects as soil, ecology, plant and animal physiology, farm crops, farming practices, genetics and microbiology.


Health and Safety
Technology
Breeding and Genetics
Sustainability
Policy and Economics
Environment
Nutrition
Food production
Soils
Formation and classification
Management
Practical activities and investigations
Properties:
- Physical
- Chemical
- Biological
Scientific Practices
Hypothesising
Experimenting
Investigating
Communicating
Interpreting
Evaluating
Contribution of science to agriculture
Crops
Plant physiology
Classification and identification
Production:
- Establishment
- Management
- Harvesting
Practical activities and investigations
Animals
Animal physiology
Food-producing and other animals
Production:
- System/Enterprise
- management
- animal husbandry
Practical activities and investigations

THE STRANDS

- There are 4 strands throughout the course:
- Strand 1: scientific practices
- Strand 2: Soils
- Strand 3: Crops
- Strand 4: animals

STRAND 1: SCIENTIFIC PRACTICES

- Hypothesising and experimenting
- Evaluating evidence and communicating
- Working safely

STRAND 2: SOILS

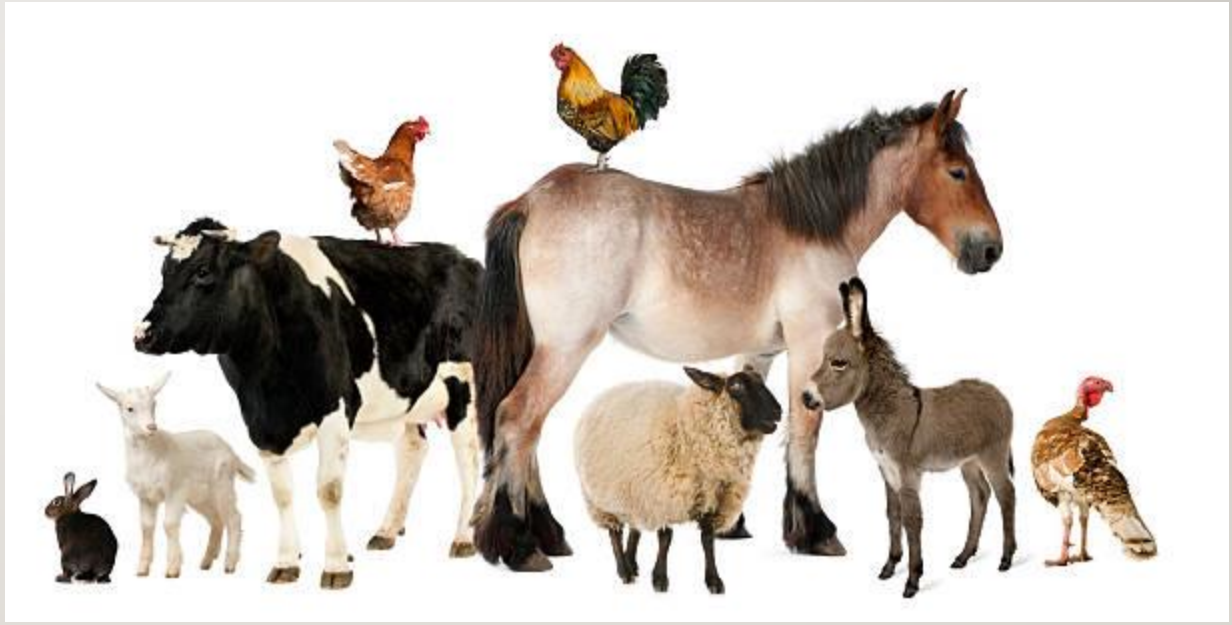
- Soil formation and classification
- Physical characteristics of soil
- Chemical characteristics of soil
- Biological characteristics of soil
- Soil management.

STRAND 3: CROPS

- Plant physiology
- Applied plant genetics
- Plant Classification
- Principles of crop production and management
- Barley
- Potatoes
- Catch crop kale (HL)/ Energy crop Miscanthus (HL)
- Grassland characteristics, grazing, management, sowing, reseeding & conservation.

STRAND 4: ANIMALS

- Animal nutrition and physiology
- Animal reproduction and genetics
- Dairy
- Beef
- Sheep
- Pigs
- Animal health and disease
- Environmental impact of agriculture.



MANDATORY ACTIVITIES

- 22 experiments (20 OL 22 HL)
- Individual investigative study (IIS) worth 25%
- Final exam 75%

IIS – INDIVIDUAL INVESTIGATIVE STUDY

- Worth 25%
- Theme changes each year –
- 2023: Exploring nutrition and nutrients - the importance to Irish Agriculture of their effective use and management
- 2024: The role of food production in maintaining natural resources in Irish Agriculture
- 2025: investigate how change(s) in agricultural practice and/or advances in technology can contribute to a positive future for Irish agriculture

Report structure and mark allocations

Section	Indicative content to be included	Marks
Introduction and background research Suggested range between 300 and 500 words	▪ Give a title to your Individual Investigative Study. ▪ Identify the agricultural enterprise chosen as the context for the study and state the topic selected for investigation. ▪ State the research question, and make clear how it relates to the theme of the brief and the chosen enterprise. ▪ Outline what the initial research you carried out tells you about the topic and the research question. Include references. (Use short in-line citations here, with full references at the end of the report).	**20**
The investigative process Suggested range between 500 and 800 words	▪ Describe the specific experiments and other relevant investigative activities undertaken, stating clearly the purpose of each and describing how it was carried out. ▪ Make clear what specific hypotheses were developed and tested. ▪ Describe in detail how you gathered the data.	**25**
Results, analysis, and conclusions Suggested range between 600 and 1000 words	▪ Present the data and results from your investigation. Use tables, graphs, and photographs as appropriate. ▪ Analyse and interpret the data, results, and other information. ▪ Make judgements and draw conclusions from your analysis. ▪ Take due account of any relevant limitations of your study. ▪ Link the conclusions clearly to the research question.	**35**
Reflection on the study Suggested range between 150 and 200 words	▪ Reflect on the insights gained from engagement with the study and comment on: ○ The degree to which the research question was answered ○ Possible changes or alternative approaches that might have made the investigation better ○ Future directions and possible areas of further investigation ○ Significance of the outcomes of the study for the agri-food sector and/or the study of agricultural science.	**10**
References	▪ Full references for all sources used during the study and/or referred to in the report. This section will not attract a separate mark. Any deficiencies in referencing will be taken account of when marking the relevant section of the report.	–
Communication and innovation	**This is not a distinct section of the report.** Marks will be awarded for evidence of taking an individual approach, for coherence and for innovative thinking.	**10**

AG SCIENCE STUDENT IIS 2025 CHECKLIST

www.theagscienceteacher.com

Use the theme, "Investigate how change(s) in agricultural practice and/or advances in technology can contribute to a positive future for Irish agriculture", as a "lens" to look through while undertaking the learning in the specification's strands and crosscutting themes.

INTRODUCTION AND BACKGROUND RESEARCH 300-500 WORDS (20 MARKS)

CHECKLIST	✓
I have given my individual investigative study a title	
I have stated the enterprise chosen as the context of the study	
I have stated the topic I will be investigating	
I have stated my research question	
** I have described how my question relates to the theme **	
I have described what my background research tells me about the topic and my research question	

EXAM PAPER LAYOUT

- There are two sections to this examination. It is recommended that you spend about 50 minutes on Section A and 100 minutes on Section B.
- Section A: Answer ten questions (out of 12) from this section. There is internal choice in four questions. Each question carries 10 marks.
- Section B: Answer any four questions (out of six) from this section. There is internal choice in two questions. Each question carries 50 marks

- LC024ALP000EV.pdf (examinations.ie)

Question 1

(a) Identify each of the following plants.

A

B

C

A:
B:
C:

(b) A student wanted to investigate the capillarity in both a compacted soil and an uncompacted soil.

(i) State a prediction for this investigation.

(ii) Describe a suitable method the student could use to carry out this investigation.

(iii) Identify **one** way the student could improve the accuracy of this investigation.

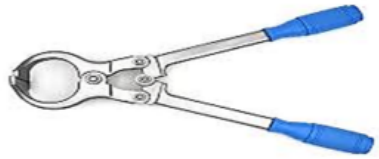
Question 3 Answer **either** (a) **or** (b).

(a) The following is an example of a farm safety notice displayed at the entrance to a farm.

(i) State the meaning of symbols **A** and **B** on the sign.

A:
B:

(ii) State the function of **C** and **D**.

C	D
	

C:
D:

(iii) In relation to picture **C** at part (ii) above, state **one** advantage of using this piece of equipment to enhance sustainability of the farm.

Question 2 Answer **either** (a) **or** (b).

(a) Identify the machine from the photographs below that is involved in the farming practices listed in the table.

Plough	Baler
	

Plate cooler	Slurry tanker
	

Farming practice	Machine name
Spreading animal waste on land	
Reducing the temperature of milk	
Turn and break up soil	
Compacts material into shape for storage	

Question 3

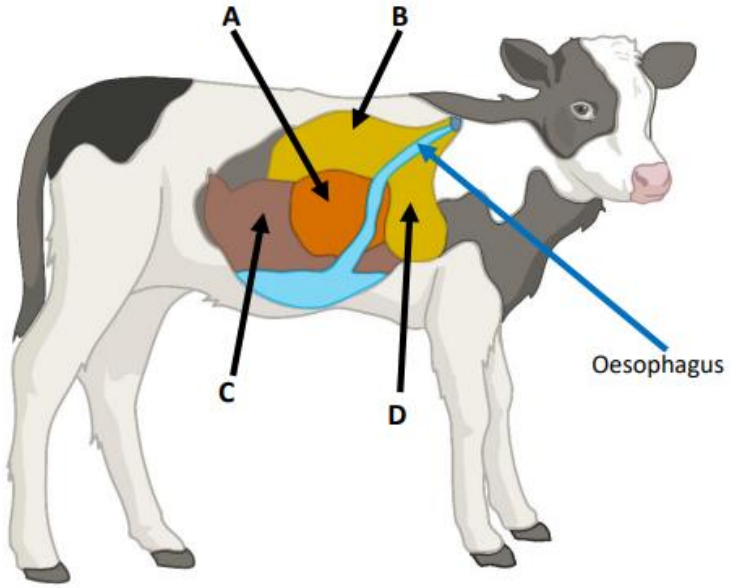
Indicate if the following are true or false by placing a tick (✓) in the correct box.

The first one has been done as an example.

		True	False
Example	***Organic matter is located in the C horizon in soil***		✓
(i)	Freeze thaw is a type of physical weathering in soil		
(ii)	Clay has the largest soil particles		
(iii)	Topography refers to the slope of the land		
(iv)	Iron pans are found in brown earth soil profiles		
(v)	Subsoil has a rich dark colour		

Question 5

The diagram shows the digestive system of a calf.
Analyse the diagram and answer the questions that follow.



(a) Label **any three** parts of the diagram using the words in the list below.

Omasum	Abomasum	Rumen	Reticulum

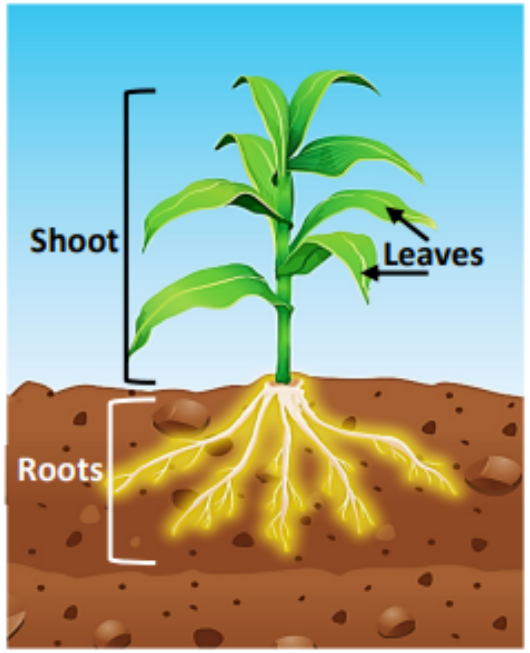
A:
B:
C:
D:

(b) Identify the first feed required by the calf by placing a tick (✓) in the correct box.

Hay	
Colostrum	
Milk	
Barley	

Question 9 Answer **either** (a) **or** (b).

(a) The diagram shows the structure of a plant. Analyse the diagram and answer the questions that follow.



(i) Identify the part of the plant that is involved in nutrient absorption.

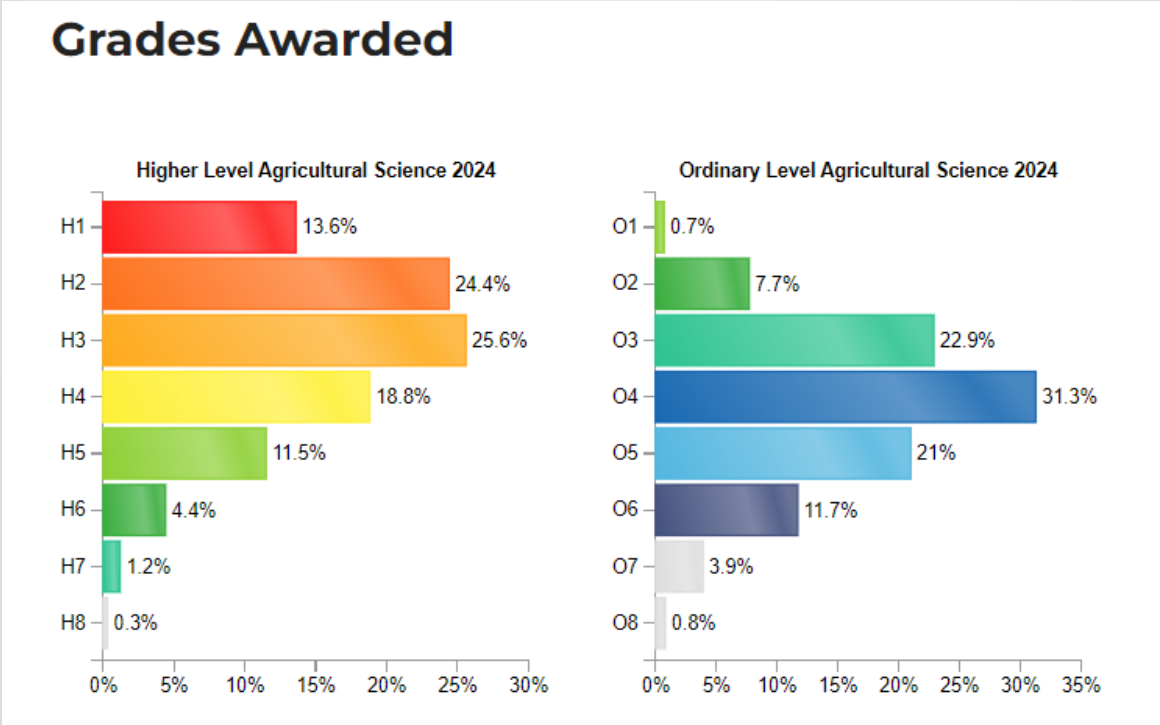
(ii) List **two** nutrients absorbed by plants.

1.
2.

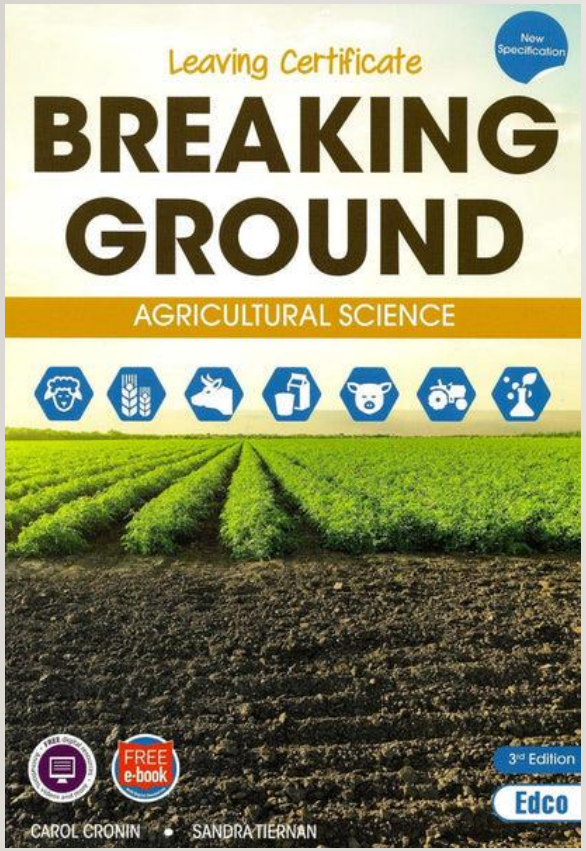
(iii) Identify the bacteria found in clover roots which fix atmospheric nitrogen into nitrates to be used by the plant by placing a tick (✓) in the correct box.

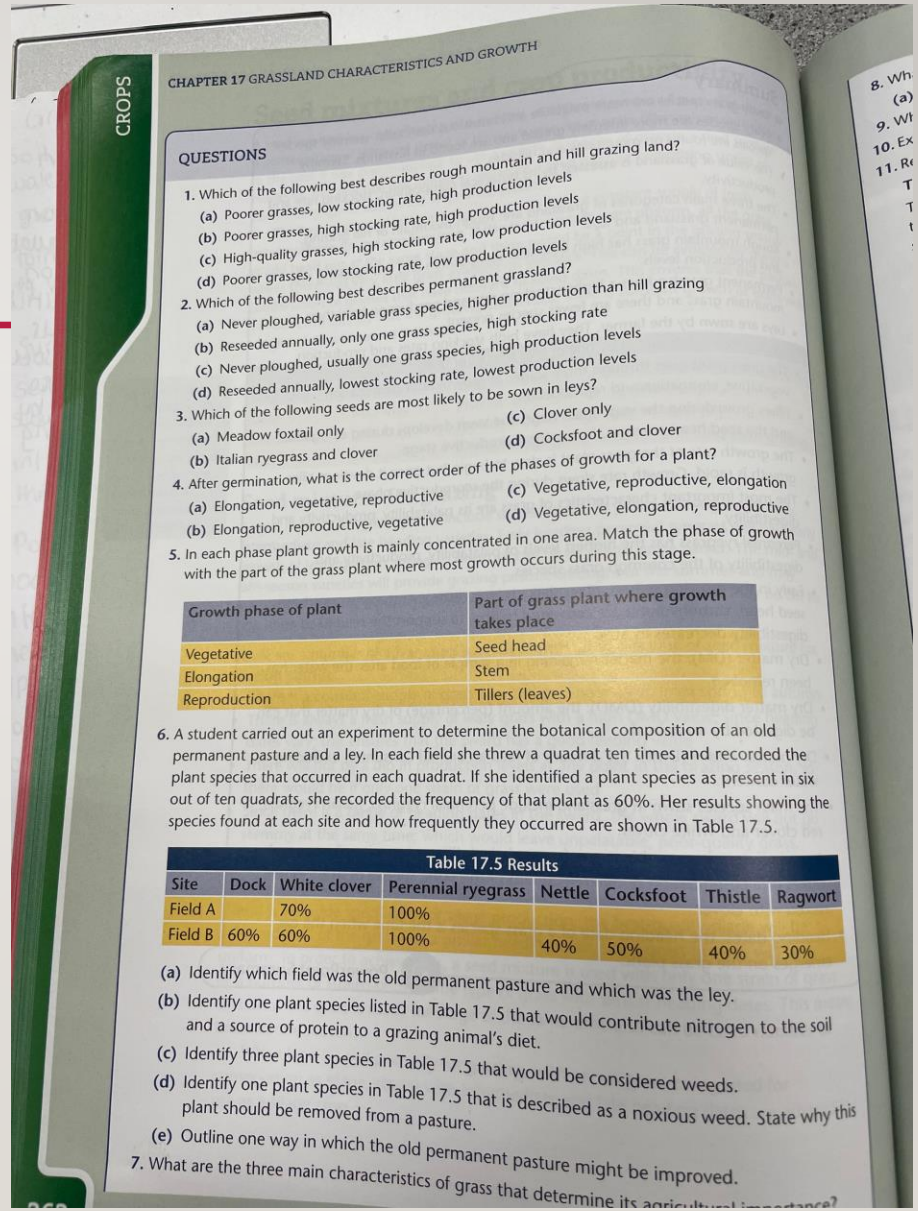
Lactobacillus	
Rhizobium	
Clostridium	

NATIONAL AVERAGE GRADES AWARDED FOR AG SCIENCE



TEXTBOOK





CROPS

CHAPTER 17 GRASSLAND CHARACTERISTICS AND GROWTH

QUESTIONS

1. Which of the following best describes rough mountain and hill grazing land?
   (a) Poorer grasses, low stocking rate, high production levels
   (b) Poorer grasses, high stocking rate, high production levels
   (c) High-quality grasses, high stocking rate, low production levels
   (d) Poorer grasses, low stocking rate, low production levels
2. Which of the following best describes permanent grassland?
   (a) Never ploughed, variable grass species, higher production than hill grazing
   (b) Reseeded annually, only one grass species, high stocking rate
   (c) Never ploughed, usually one grass species, high production levels
   (d) Reseeded annually, lowest stocking rate, lowest production levels
3. Which of the following seeds are most likely to be sown in leys?
   (a) Meadow foxtail only
   (b) Italian ryegrass and clover
   (c) Clover only
   (d) Cocksfoot and clover
4. After germination, what is the correct order of the phases of growth for a plant?
   (a) Elongation, vegetative, reproductive
   (b) Elongation, reproductive, vegetative
   (c) Vegetative, reproductive, elongation
   (d) Vegetative, elongation, reproductive
5. In each phase plant growth is mainly concentrated in one area. Match the phase of growth with the part of the grass plant where most growth occurs during this stage.

Growth phase of plant	Part of grass plant where growth takes place
Vegetative	Seed head
Elongation	Stem
Reproduction	Tillers (leaves)

6. A student carried out an experiment to determine the botanical composition of an old permanent pasture and a ley. In each field she threw a quadrat ten times and recorded the plant species that occurred in each quadrat. If she identified a plant species as present in six out of ten quadrats, she recorded the frequency of that plant as 60%. Her results showing the species found at each site and how frequently they occurred are shown in Table 17.5.

Table 17.5 Results

Site	Dock	White clover	Perennial ryegrass	Nettle	Cocksfoot	Thistle	Ragwort
Field A		70%	100%				
Field B	60%	60%	100%	40%	50%	40%	30%

   (a) Identify which field was the old permanent pasture and which was the ley.
   (b) Identify one plant species listed in Table 17.5 that would contribute nitrogen to the soil and a source of protein to a grazing animal's diet.
   (c) Identify three plant species in Table 17.5 that would be considered weeds.
   (d) Identify one plant species in Table 17.5 that is described as a noxious weed. State why this plant should be removed from a pasture.
   (e) Outline one way in which the old permanent pasture might be improved.
7. What are the three main characteristics of grass that determine its agricultural importance?

FIELD TRIPS

- Recent trips:
- Larry O'Dwyer's barely/potatoe farm
- Kildalton agricultural college
- Ploughing championship


McHale
691
Certa
Castrol


ROOSTER
Size 45mm-80mm
10kg Net Weight


Grassland
NPK FERTILIZER
7-6-17

POSSIBLE CAREERS

- Greenkeeping, Horticulture, Food Science, Agricultural Advisers, Agricultural Engineering, Sports Turf Management, Environmental Science, Forestry, Farming, Marine Science, Careers in Renewable Energy and Teaching.
- **Required for 3rd Level?**
- This subject is not an essential requirement for any courses in the CAO system.

WOULD YOU LIKE TO TAKE UP THIS SUBJECT?

- Do you have a farming background?
- Do you have an interest in farming and biology?
- Are you studying Biology or geography (good crossover of information)
- Do you have (or intend to get) farming experience?
- Are you willing to put the time and effort into your IIS/ did you enjoy the CBA at JC science?
- Are you planning on studying something like - Veterinary Science, Science or Medicine in college.