



# BSc (Hons) Agriculture with Mechanisation

<b>UCAS code</b>	D492
<b>Institution code</b>	H12
<b>Duration</b>	4 years (full-time) including a one-year work placement
<b>Start date</b>	September 2019
<b>Location</b>	<a href="#">Harper Adams University campus</a> (and location of work placement)

## The course

As farms become larger and agricultural production systems more efficient they become increasingly mechanised. The industry needs highly skilled graduates who understand how agricultural machines and mechanised systems operate, and how machinery should be effectively managed on farms and within contracting businesses. These courses provide students with a thorough grounding in agriculture and mechanisation.

## A-level entry requirements

- Offers tend to be in the region of **96 - 112** UCAS points from a minimum of 3 A levels (the lower offer will be limited to those taking Science A Levels)
- General Studies and Critical Thinking are encouraged but **not** included in grades required
- Students should typically be studying **3 subjects at A2 level** to be considered
- There is a requirement for all applicants to have completed a minimum of 10 weeks work experience on a commercial farm by the 1st August. Gaining the relevant practical experience in advance of the start of the course is preferable. However, for applicants applying for our BSc (Hons) Agriculture programmes, who do not come from a farm background and who do not have the relevant contacts necessary to complete the work experience, we recognise that this may be difficult to achieve. Applicants who are assessed to be in this position, following interview, will be offered the opportunity to enter the course via the [Access to Agriculture](#) programme, where help to gain the relevant practical experience is provided during the first year of study.
- **4 GCSEs at grade C/4 or above**, including English Language, Maths and a Science
- Applicants can expect to receive offers including specific grades in specific subjects (for example, a B or C at A level, or an M or D for BTEC modules)
- **Biology A Level** (or equivalent) preferred (but not mandatory)
- When combining qualifications no more than one Subsidiary Diploma will be considered alongside A levels (two A levels for BSc)
- Overseas applicants please check our [English Language Requirements](#)
- All suitable applicants are expected to attend an interview which will form part of the selection process
- More information about the work experience required for this course can be found by clicking the link below  
[Find out more about work experience](#)

*Note: Entry Requirements are for guidance only, please check the UCAS website or contact Admissions for further information.*

# Work placement

BSc students undertake placement in their third year. You will enjoy a year of paid employment in a business related to your career aspirations and experience. Recent placement employers have included machinery dealerships or manufacturers such as Kuhn, John Deere (both in the UK and their European HQ in Mannheim, Germany), Claas, CNH and Agco, in roles as machinery demonstrators, dealer technicians, machinery testing or sales. Several commercial scholarship opportunities, linked to placement, are available to apply for with sponsoring companies paying a significant amount towards the tuition fees of successful applicants. Agriculture students from a family farm wishing to undertake a farm placement are required to work at least 50 miles from their home farm and are not usually normally permitted to return to previous employers.

# Teaching and learning

## What you study

All agriculture students share a common first year, studying the same modules; this allows students to change course during the first year.

The first part of the course provides a general introduction to agriculture in terms of animal and crop production, underpinning biological and environmental science, an introduction to farm business management and marketing, and agricultural mechanisation. In the second part of the course you start to specialise in the area of mechanisation studying areas such as farm machinery technology, hydraulics and electrics, and mechanisation aspects of soils and farm infrastructure. The mechanisation aspects are studied alongside more general aspects of agriculture such as waste management, crop production and science, and farm business management. In the final year the specialisation is developed further, studying areas such as machinery technology and information systems, measurement and control systems, applied mechanisation projects in association with industry, and a research project with a mechanisation focus. In the final year students study mechanisation modules alongside crop production and crop protection modules.

The principles of mechanisation are developed in an applied way without the use of complex mathematics.

## Teaching and learning

The course involves a combination of lectures, tutorials and laboratory sessions, together with practical classes on the [University farm](#) designed to demonstrate principles in practice and the application of scientific, technological and business principles to commercial agricultural and food production. In addition, the University has extensive links with other agricultural and food related businesses, and external visits and outside speakers are integrated into the programme. Throughout the course students are expected to apply the skills acquired to solve real-life problems, such that on completion they are able to demonstrate both academic ability and commercial application, which is a combination highly valued by employers. The proportion of independent study increases as the course progresses, particularly in the final year where students have the opportunity to undertake a dissertation in a subject area of their choice.

## Assessment methods

Assessment is via a balance of course work and examination. Weighting varies depending on course and year of study, but weighting is typically around 65 per cent on course work and 35 per cent on examination; this allows individuals to play to their strengths if they are better at course work than examinations or vice versa. Types of assignment include appraising production systems on the [University farm](#), whole farm case studies, laboratory based analyses and literature based reviews. Format of assignments varies and includes written reports, essays, technical notes, presentations and oral examinations. Students receive written feedback on all course work to help them improve. In addition, first year students undertake examinations in two subjects at the end of the first term to enable them to gauge how they are progressing and feedback is provided on these exams. Staff are able to provide advice and guidance on revision, and many modules include revision sessions.

# Careers

The skills you will develop will be useful throughout the industry, whether managing large, highly mechanised farms, running a successful contracting business or working in the agricultural machinery sector. Harper Adams graduates have a long history of successfully finding employment within all of these areas of work.

# What will I study?

Year	Study time (The percentage of time spent in different learning activities)			Assessment methods (This is the breakdown of assessment methods)		
	% time in lectures, seminars and similar	% time in independent study	% time on placement	Written exams	Practical exams	Coursework
1	33%	67%	0%	41%	0%	59%
2	27%	73%	0%	38%	0%	62%
3	0%	0%	100%	0%	0%	100%
4	18%	82%	0%	25%	0%	75%

Year 1	Year 2	Year 3	Year 4
Skills for the Agricultural Professional (C4001C17) 15	Grass and Forage Production and Utilisation (C5004C17) 15	Placement year	Honours Research Project (HRPROJ) 30
Animal Production Systems (A4005C17) 15	Wastes, Manures and Renewables (C5007C17) 15		People Management Skills (R6018C17) 15
Crop Production Systems (C4013C17) 15	Farm Business Management and Economics (R5003C17) 15		Sustainable Crop Production Systems (C6014C17) 15
Bioscience for Agriculture (C4011C17) 15	Research Methods (C5005C17) 15		Science Technology and Information Systems for Agriculture (E6013C17) 15
Environmental Science for Agriculture (C4014C17) 15	Crop Production Science (C5002C17) 15		Team Enterprise Project (E6014C17) 15
Assessment of the Farm Business (R4010C17) 15	Farm Machinery Technology and Management (E5003C17) 15		Measurement and Control (E6009C17) 15
Agri-food Marketing (F4005C17) 15	Hydraulic and Electrical Power for Agriculture (E5002C17) 15		Crop Protection and Technology (C5003C17) 15
Agricultural Mechanisation and Buildings (E4001C17) 15	Soil Use and Farm Infrastructure (E5001C17) 15		

## Skills for the Agricultural Professional

Year of study 1

Code C4001C17

Credits 15

Core/option Core

Module contact [Terry Pickthall](#)

This module helps develop students' confidence and competence in the academic skills and professional practices that will enable success within their Agriculture course. The module has four main strands or themes:

1. **Academic skills** including exploring Reading for Success, writing in different ways and information searching.
2. **Professional futures** preparing for placement and employment.
3. **Learning well** which promotes students' self-monitoring and planned improvements in individual approaches to learning.
4. **Digital citizenship** where students review the online and information technology skills that they need to succeed in study and in their professional practice.

Agriculture students will follow a common study programme, but they will be encouraged to spend more time on areas of development that they recognise as challenging. The module is designed to equip students

with skills but also with personal resilience, the ability to take control of their own learning, the ability to study independently and to introduce them to the concept of continuing professional development.

## Animal Production Systems

**Year of study** 1

**Code** A4005C17

**Credits** 15

**Core/option** Core

**Module contact** [Dr John Donaldson](#)

An understanding of livestock production underpins many careers within the land based sector and forms a significant part of the global food industry. As such, an understanding of livestock systems is required across a range of courses.

The module will provide learners with a knowledge of the main livestock systems and how these systems inter-relate with other sustainable land based activities. The various systems will be considered in terms of input requirements, production and husbandry and analysis and interpretation of physical and financial performance data. The module will also consider aspects of sustainable production both in terms of changes to EU support and in light of global population changes.

You will:

- Develop an understanding of the systems of management for the various meat, milk and egg producing systems in the UK and EU and how these are impacted upon by changing legislation and consumer requirements.
- Identify the factors which influence the quality and safety of produce derived from farm animal production systems.
- Relate the requirements of farm animals to land type, building design, equipment and housing systems employed.

## Crop Production Systems

**Year of study** 1

**Code** C4013C17

**Credits** 15

**Core/option** Core

**Module contact** [Mr Matthew Rodenhurst](#)

The module will cover the crop production processes characteristic of NW Europe, including wheat, barley, oilseeds, potatoes, sugar beet, grassland and forage. You will focus on 'best practice' crop production methods for a range of food and non-food crops and will be related to the need for resource efficient, economic and environmentally acceptable production linked, where necessary, to the current EU and UK Single Payment Schemes.

The module will provide the necessary basic understanding of crop production practices and the related regulatory framework appropriate for higher level study. The module will provide underpinning crop production knowledge for a range of crop science and agronomy modules.

You will:

- Identify the essential requirements for the establishment, growth, development and market requirements of a range of crops.
- Explain and interpret the underlying concepts and principles of crop production associated with current best practice.
- Relate the short and long term factors influencing crop management to appropriate farm practice.
- Interpret qualitative and quantitative data relevant to crop production practices.
- Assess the wider consequences of crop production activities in the context of sustainable production systems.

## Bioscience for Agriculture

**Year of study** 1  
**Code** C4011C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Laura Vickers](#)

This module will develop an understanding of the basic physiological processes that occur in both plants and animals. By the end of this module students should have an understanding of co-ordination and digestion in farm animals, the importance of morphology, photosynthesis, translocation and water relations in plants, and the diverse roles that micro-organisms play in plant and animal production systems. In addition, this module provides an introduction to basic laboratory skills.

The information gained in this module forms a foundation for later Animal Science and Crop Science modules.

You will:

- Describe underpinning biological and chemical processes in agricultural and applied sciences, and apply basic laboratory techniques in the study of animals, plants and micro-organisms.
- Identify the similarities and differences in the key biological processes taking place in microbes, plants and animals and relate how these processes contribute to growth and replication.
- Explain the necessity for co-ordination in animals and plants and describe how this is achieved via chemical and nervous control mechanisms.
- Identify and explain the functions of major anatomical structures and their roles in plants and animals.

## **Environmental Science for Agriculture**

**Year of study** 1  
**Code** C4014C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr William Hartley](#)

The aim of the module is to provide students with an understanding of how agriculture interacts with the surrounding environment. There will be an emphasis on sustainability and the ecological consequences of unsound management decisions on conservation. The nature of soil and water systems will be investigated, and the factors which influence natural soil systems identified, soil formation, soil properties and hydrological relationships will be studied whilst the effect of climate change on soils and water will also be investigated.

You will:

- Define the effects of natural and human-induced processes upon soil formation.
- Explain the effects of climatic change on soils.
- Classify different soil types and recognise simple soil profiles.
- Identify the distribution of valuable habitats in lowland and upland environments.
- Describe the hydrological cycle in detail and its importance to agricultural sustainability.

## **Assessment of the Farm Business**

**Year of study** 1  
**Code** R4010C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Wyn Morgan](#)

This module is designed to introduce students to the basic knowledge needed to determine areas of strength and weakness within a farming business. Students will be introduced to basic business concepts associated with the recording and reporting of business and enterprise performance. They will then be introduced to techniques for analysis and evaluation of the data, to include different types and sources of

external comparative data.

You will:

- Explain the role and scope of management in the farm business.
- Prepare and interpret a set of farm management accounts.
- Identify and analyse the performance of individual enterprises.
- Discuss the administrative methods/systems that are required in order to produce management data.

## Agri-food Marketing

**Year of study** 1  
**Code** F4005C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Patricia Parrott](#)

This module will provide students with knowledge of the marketing systems and market opportunities of major agricultural commodities open to primary producers. It will consider and evaluate the global and dynamic market forces affecting the interdependent players of the agri-food supply chain from primary producer to the end consumer and the extent to which this influences the primary producer's approach to agri-food production and marketing. It will cover the concept of 'farm to fork' and where alternative opportunities exist for primary producers and agricultural businesses. The role of market planning and management of risk along with methods by which this may be achieved will be reviewed in order to result in higher levels of efficiency, effectiveness and market returns.

You will:

- Identify and explain the factors influencing changes in production, channels of distribution and consumption within the UK for major farm commodities.
- Appraise the global business and market environmental factors that influence the UK agri-food supply chain.
- Identify the role of market planning in UK farm businesses and methods to maximise producer returns and manage risk.
- Discuss the alternative marketing systems and options open to primary producers for best use of resources and sustainability.

## Agricultural Mechanisation and Buildings

**Year of study** 1  
**Code** E4001C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Simon Woods](#)

Modern farming systems rely heavily on mechanisation and farm infrastructure. Those involved in the farming industry need to be familiar with the basic operating principles and management of these assets and require an understanding of how machinery is combined to perform different tasks. This module is designed to enable the student to understand the operating principles of the more common agricultural machines and equipment and to comprehend the management of mechanisation systems in to which they are integrated.

To successfully complete this module, students will have to demonstrate understanding of a broad range of scientific, economic and business concepts and principles relevant to farm mechanisation.

## Grass and Forage Production and Utilisation

**Year of study** 2  
**Code** C5004C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Louisa Dines](#)

Feed and forage costs are one of the largest drivers of cost of production on livestock units. Improving the quantity and quality of forage a business can produce and utilising it efficiently, is a crucial element to maintaining competitiveness in the current economic climate. Small improvements in the productivity and utilisation of these crops can have a major impact on the economic performance and therefore viability of livestock production systems. These improvements can include better variety and site selection, better establishment and agronomic management, more accurate assessment of appropriate harvesting/grazing time and method, appropriate storage conditions and more accurate assessment of nutritional quality.

This purpose of this module is to introduce the key features of grassland and the main alternative forage crops and describe their suitability for different sites and production systems. It covers the principles and practices of production, harvesting, storage and effective utilisation of a range of grass and forage crops whilst considering the impact of forage production and utilisation on the environment and how any potential negative effects can be mitigated.

## **Wastes, Manures and Renewables**

**Year of study** 2  
**Code** C5007C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Paul Lewis](#)

Population growth and human lifestyle are increasingly putting pressure on the earth's natural resources, with many activities being far from sustainable. Waste production and waste/energy management are key issues for policy makers and advisors. A major influence on future planning is climate change, which may impact on many of our natural resources and agricultural systems. Careful, appropriate and innovative approaches to managing resources are therefore necessary.

This module focuses on three key areas, waste production and management, organic manures, both farm and off-farm, and renewable energy. In detail it investigates how waste can be minimised and utilised for secondary value, particularly within agriculture. It includes study of the waste hierarchy and its implementation, manure management, energy conservation and renewable energy. The approach will be wide-ranging but there will be an overarching emphasis on agricultural and rural examples with environmental implications.

## **Farm Business Management and Economics**

**Year of study** 2  
**Code** R5003C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Tony Asson](#)

This module builds on knowledge from the first year module Assessment of the Farm Business by introducing students to whole farm business planning techniques in the context of the assessment of the external business environment.

The module incorporates applied agricultural economics (differentiated from neo-classical economics and economic theory and formulation expected on an Ag Econ programme) to develop an understanding of the wider issues and drivers affecting prospects in the main commodity sectors. Incorporating further assessment of the productivity factors of the business (Land; labour; capital etc.) and building on identified strengths and weaknesses within the business identified through the application of assessment techniques, students will be introduced to forward budgeting and planning techniques at enterprise and whole business levels.

## Research Methods

**Year of study** 2  
**Code** C5005C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Edward Dickin](#)

This module is the fourth in the Professional Scholarship Programme (PSP). The module particularly develops the skills and knowledge necessary to successfully complete the Honours Research Project, which will also enhance employability skill for the Placement Period and careers on graduation.

The module will cover the key elements of the research process, set in the context of the student's own course discipline. Students will examine the academic and industrial role of research and how it informs professional and managerial practice. They will enhance their ability to locate, select and critically evaluate information associated with a particular problem, using a range of sources and particularly peer reviewed empirical studies. In addition the students will plan, and justify the need, and investment for research in an effort to develop their insight into the management of practical research. By carrying out statistical analysis using appropriately accessible software, the students will develop their ICT skills and further their understanding of the role of statistics in the research process.

While the intended learning outcomes are common to all students across the University, this module provides discipline specific focus with content, learning and assessments that are tailored for subject/course needs, which will then lead to value interpretation and communication of research outcomes.

## Crop Production Science

**Year of study** 2  
**Code** C5002C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Andrew Watson](#)

The successful production of crops requires good nutrient management and successful crop protection. This module will enhance students' understanding of the science of fertilisers and pesticides, and build on this to enable them to develop appropriate nutrient management and crop protection strategies. It is also important that these strategies take into account potential environmental and human health impacts and follow good agricultural practice.

## Farm Machinery Technology and Management

**Year of study** 2  
**Code** E5003C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Simon Woods](#)

Modern farming is highly mechanised. Those involved in the industry need to understand the general mechanical principles by which a wide range of machinery works and appreciate how machine management and machine adjustments affect performance. This module builds from the basic introduction to farm machinery given in the module *Agricultural Mechanisation and Buildings*. It is more technical and provides intensive instruction in the principles of operating, setting up and managing common pieces of farm equipment and mechanised systems. To successfully complete this module, students will have to demonstrate understanding of a broad range of scientific, economic and business concepts and principles relevant to farm mechanisation. They will do this by selecting and applying the appropriate concepts and principles to an individual machinery selection assignment.

## Hydraulic and Electrical Power for Agriculture

**Year of study** 2  
**Code** E5002C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Mr Graham Higginson](#)

Virtually all agricultural machines and off-road vehicles transmit and control power using a combination of electrical, hydraulic and mechanical systems. Those planning careers involving agricultural or off-road machinery need to appreciate the fundamental principles of electrical and hydraulic systems and how they are used to control and transmit power. They should also be able to design simple systems incorporating these elements.

This module, designed for Agriculture with Mechanisation students, provides knowledge that underpins the subsequent Measurement and Control module.

## Soil Use and Farm Infrastructure

**Year of study** 2  
**Code** E5001C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Mr Simon Cooper](#)

This specialist module builds on principles introduced in the modules Animal and Crop Production Systems, and Agricultural Mechanisation. The success, or failure, of a modern farm enterprise rests, in part, with the appropriate use of available resources such as the soil and buildings. Stock and crops when harvested are housed or stored in buildings that are intrinsically linked to the land through their foundations and drainage systems. By products of farming enterprises are then returned to the soil, as a valuable soil conditioner and fertiliser.

This module aims to show how the physical properties of soil influence its mechanical and structural behaviour and how soil water content is controlled through drainage and irrigation. At the same time, the design and construction of modern farm buildings used for livestock production and crop storage will also be considered. Particular attention will be given to meeting the requirements of welfare legislation in livestock building design and environmental considerations to reduce aerial, surface and ground water pollution.

## Placement year

**Year of study** 3  
**Core/option** Core

Read our dedicated [Placement Learning](#) pages for information on the many benefits of the placement year.

## Honours Research Project

**Year of study** 4  
**Code** HRPROJ  
**Credits** 30  
**Core/option** Core

To qualify for an honours degree a student must demonstrate the capacity for sustained, independent and high quality work. One of the most important vehicles for the demonstration of this capacity, and for developing the necessary skills, is the individual Honours Research Project. Each student will therefore be required to complete such a project under the general supervision of a member of staff and present the results in a project report and in a viva voce exam, with two tutors, which will also test to a high level, skills of communication and rational argument. This major exercise represents one-quarter of the final year

studies and will therefore have an important influence on the classification of award.

## People Management Skills

**Year of study** 4  
**Code** R6018C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Nigel Hill](#)

The structure of UK agriculture over recent years has resulted in an increase in size of farms and a reduction in the number of employed staff. However, the cost to farm businesses of poor people management skills is substantial, so it is essential that students have an understanding of the effective management of people.

This module is designed to develop an understanding of human motivation and management style, the responsibilities of employer and employee and an appreciation of how to manage effective interpersonal relationships at work, particularly drawing on experiences from placement. Group work and digital activities particularly will develop the graduate skills required for the rapidly changing workplace environment.

## Sustainable Crop Production Systems

**Year of study** 4  
**Code** C6014C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Martin Hare](#)

This module examines the factors affecting the sustainability of agriculture and takes a holistic view of how farming methods and systems can address these factors. The module deals primarily with cropping systems as it is designed to allow students with a crops focus to apply their technical knowledge of production practices within a sustainability context. The module therefore builds on, and brings together, elements and prior knowledge obtained from previous study and experience. The main theme within the module will be the concept of sustainable intensification and the integrated farm management production system. The role of agriculture in biofuel production will also be explored.

## Science Technology and Information Systems for Agriculture

**Year of study** 4  
**Code** E6013C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Simon Woods](#)

Mechanised agriculture has seen a shift towards the integration of agricultural science, machinery and computer based decision support systems. The large volumes of data produced by these systems needs to be utilised effectively to make the use of such systems financially viable. This module will build upon the level 5 module Farm Machinery Technology and Management and will complement the level 6 module Measurement and Control, by examining the relationship between machines, computer based applications, sensor information and its relevance and usefulness to the farm manager.

## Team Enterprise Project

**Year of study** 4  
**Code** E6014C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Mr Jim Loynes](#)

The module aims to give the student experience of involvement in a team when tackling a multi-disciplinary engineering/mechanisation problem and thereby enhancing team skills. It relates prior learning to the management and execution of a defined multi-disciplinary project. Each team of students' project is generally sourced from companies within the agricultural engineering industry. These projects are technical and commercial in nature. Teams investigate an allocated problem and then give a presentation to the sponsoring company towards the end of the academic year.

Companies provide background information, details of the problem, and some references for the team at the outset. If there are any other requirements, in addition to the final report, these will also be made clear at the start of the project. Tutorials on project management and additional educational material will be provided by the supervising staff as appropriate and where necessary.

## Measurement and Control

**Year of study** 4  
**Code** E6009C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr Sven Peets](#)

This module builds upon the principles of electrical science studied in the **Hydraulic Power and Electrics** module. It covers the range of instrumentation used for engineering data acquisition and investigates the use of Programmable Logic Controllers (PLCs) for control. This is intended to equip the students with a level of competence and understanding of these items of equipment to enable them to actively participate in the **Group Enterprise Project**. It also investigates the use of Global Positioning Systems, automatic steering, agricultural field robotics, and CANbus based technology for control.

- Select a suitable instrumentation system, apply it to a given task and evaluate its effectiveness.
- Evaluate collected data for reliability, noise and resolution.
- Appraise the appropriateness of precision farming technology for a given task.
- Assess the suitability of agricultural field robots for a particular job.

## Crop Protection and Technology

**Year of study** 4  
**Code** C5003C17  
**Credits** 15  
**Core/option** Core  
**Module contact** [Dr John Reade](#)

Although considerable improvements have been made over the last half a century, loss of yield and quality still represent by far the largest constraining issues facing crop production. This module allows students to fully investigate integrated and sustainable crop protection solutions to address this. An integrated approach needs to synergistically consider physical, cultural, biological and chemical approaches to the management of weeds, pests and diseases. Accurate identification is vital, and a full understanding of the lifecycles and associated integrated management of weeds, pests and diseases is essential for using pesticides efficiently, for the reduction of pesticide resistance and to make crop protection more environmentally acceptable. Current legislation requires that all pesticides are approved and that all advisors and users of pesticides are competent to perform the duties required of them. Persons employed in production agriculture, who may be involved with the use of pesticides, should therefore be fully conversant with the principles and practice of pesticide use and be fully aware of the potential hazard they pose to operators, consumers, wildlife, the environment and to cropping systems. In addition, students involved in the planning, development or assessment of pest management programmes require a thorough grounding in the principals involved in pesticide formulation and application. Precision detection, mapping and application in crop protection (and other new technologies) will be discussed throughout the module.