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## **BASIS CERTIFICATE IN CROP PROTECTION SYLLABUS & INFORMATION**

The BASIS Certificate in Crop Protection has been established since 1978 to provide training and certification for sellers of agrochemicals and those giving advice on their use.

In 1985 the Food & Environment Protection Act (FEPA) made certification a statutory obligation for pesticide sellers.

" No person shall sell, supply or otherwise market to the end-user a pesticide approved for agricultural use unless he has obtained a certificate of competence recognised by the Ministers, or he sells or supplies that pesticide under the direct supervision of a person who holds such a certificate"

The BASIS certificate in Crop Protection has been approved by Ministers to meet the requirements of Schedule 2 of FEPA for certification for those involved in sale and supply of pesticides.

This booklet is designed to help those involved with training people to meet this standard and provide guidelines to the subject areas which need to be covered to enable them to achieve a satisfactory level of competence.

It is essential that candidates understand the need for a practical approach to training because in order to be successful, individuals must be able to give sound technical advice in the field. Obviously some of the training will be of a theoretical nature but both the syllabus and training programme should be interpreted to provide practical instruction wherever possible.

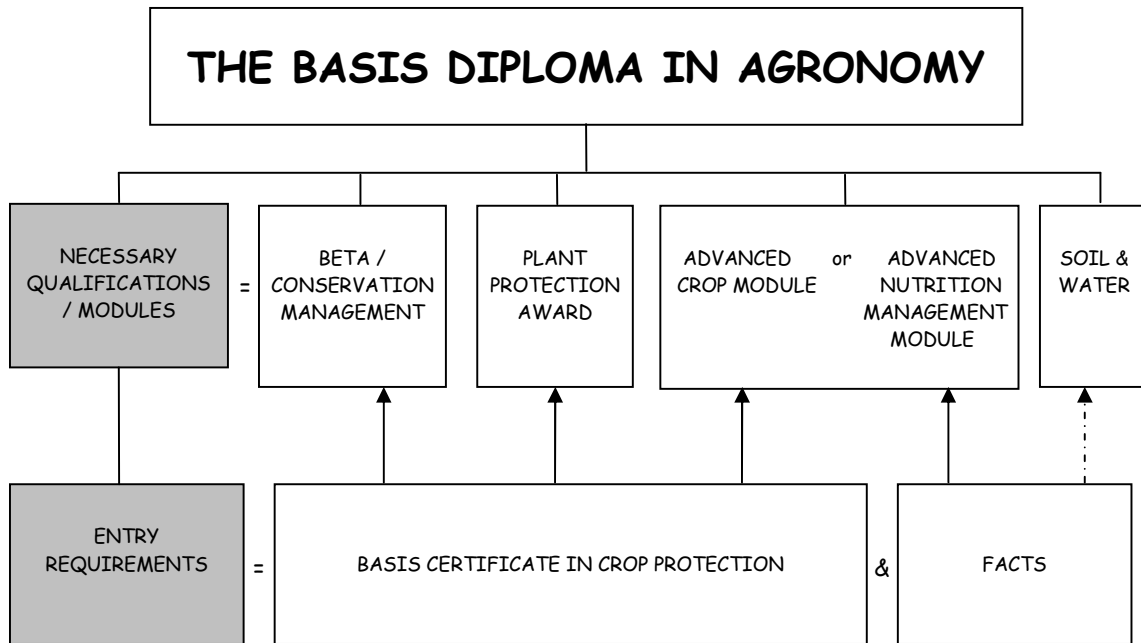
All staff employed in the field sales of agrochemicals and/or giving advice on their use must, under the Control of Pesticides (Amendment) Regulations 1997, have obtained a Certificate of Competence or exemption from it within three years of entering the Crop Protection industry. New staff to the industry will be allowed a period of three years in which to qualify, during which they will be working under the supervision of a qualified member of staff.

Candidates must have had satisfactory training and supervised field experience before entering for the BASIS examinations. If in doubt as to this requirement, please contact the BASIS office. Candidates who are ill-prepared for the examination obviously represent a waste of time and money to their employer and a waste of time to the examination panel, who give freely of their services. Remember, new entrants to the industry are given up to three years working under supervision before being required to hold the BASIS Certificate in Crop Protection.

Courses are offered for the BASIS Certificate in Crop Protection by the BASIS Approved Trainers listed in this booklet. Courses are run as either day release or in blocks of a week at a time; please contact the trainer of your choice for details.

## THE BASIS DIPLOMA IN AGRONOMY

The breadth and scope of knowledge needed for crop protection sales and advice grows every year. New products, new techniques and the way that crop protection fits with other farm and crop management activities all add to the skills needed by those involved in sales and advice for Crop Protection. To cover the range of factors involved, the new BASIS Diploma in Agronomy, as set out below, gives a comprehensive training and qualification framework for those involved in on-farm advice and sales.



### TOPICS COVERED

<b>ADVANCED CROP MODULE / ADVANCED NUTRITION MANAGEMENT MODULE</b>	Weed, Pest & Disease Control, Crop Protection Programmes, Marketing, Food Industries, Crop Assurance, Nutrient Management
<b>BETA / CONSERVATION MANAGEMENT PLANT PROTECTION AWARD (PPA)</b>	Environment, Biodiversity, EIS's, CPMP's, ICM, Climate Change Systems & Society, Formulation, Mode of Action, Application, Health & Safety
<b>SOIL &amp; WATER</b>	Cultivation Types and Properties, Cropping Systems, Water Quality, Drainage, Pollution/Waste, Plant Nutrition

For the PPA and the Advanced Crop Module the prior achievement (by examination, exemption or validated certificate) of the BASIS Certificate in Crop Protection is an entry requirement. For the Advanced Nutrient Management Module the prior achievement of the FACTS qualification is required.

Prior qualification of the BASIS Certificate in Crop Protection (or exemption or validated certificate) or the Crop Protection Management and / or POWER Certificates are required for the BETA examination. In some circumstances, it may be possible for other types of prior qualification to be taken into account for BETA examination eligibility. BASIS Approved Trainers must be assured that in such cases, the prospective candidate is capable of assimilating the knowledge imparted during the BETA course tuition and also capable of passing the BETA examination.

It is **strongly** recommended that candidates should have had at least two years experience of on-farm practical agronomy before attempting any of the modules which contribute towards the BASIS Diploma in Agronomy, but in particular before taking the Plant Protection Award.

BASIS CPD points are available for training and certification in all modules of the BASIS Diploma.

The accreditation process for our qualifications has enabled BASIS to demonstrate a high standard of training and certification for our BASIS courses. The BASIS Diploma comprises a number of modules and 6 are required to complete the qualification.

A further consequence of accreditation by HAUC and the Higher Education qualifications framework has been the development by HAUC of a Graduate Diploma in Agronomy with Environmental Management.

BASIS courses have all been awarded a number of credits based on the time spent on the course (Targeted Learning Hours). This is a recognised formula including face to face tuition time, research, reading and experiential learning. The credits are awarded at a level that reflects the intensity / difficulty of the learning materials, for example A-level equivalent or 1st, 2nd or final year honours degree etc.

The qualifying BASIS courses with credits and levels awarded are shown below:

<b>FACTS</b>	
<b>Credit Value</b>	15
<b>Level</b>	Intermediate

<b>SOIL &amp; WATER</b>	
<b>Credit Value</b>	15
<b>Level</b>	Honours

<b>BASIS CROP PROTECTION</b>	
<b>Credit Value</b>	30
<b>Level</b>	Honours

<b>BASIS PLANT PROTECTION AWARD</b>	
<b>Credit Value</b>	15
<b>Level</b>	Honours

<b>BASIS ADVANCED MODULES / ADVANCED NUTRIENT MANAGEMENT MODULE</b>	
<b>Credit Value</b>	15
<b>Level</b>	Honours

<b>BETA / CONSERVATION MANAGEMENT</b>	
<b>Credit Value</b>	15
<b>Level</b>	Intermediate

Intermediate = 2<sup>nd</sup> or 3<sup>rd</sup> year of university degree qualification.

Honours level - final year university degree.

Eg. FACTS 15 credits = 150 hours notional teaching time

The six modules required for the BASIS Diploma add up to 105 credits. In order to qualify for the HAUC Graduate Diploma in Agronomy with Environmental Management, candidates will need to accumulate 120 credits (ie one extra 15 credit module in addition to the BASIS Diploma). This can be any of the Advanced Crop Modules or the new Nutrient Management Planning qualification, available from September 2009.

Further details of the BASIS Diploma in Agronomy can be obtained from the BASIS office or by e-mail to [sue@basis-reg.co.uk](mailto:sue@basis-reg.co.uk) or [steph@basis-reg.co.uk](mailto:steph@basis-reg.co.uk) or [amanda@basis-reg.co.uk](mailto:amanda@basis-reg.co.uk)

## EXAMINATION GUIDELINES

### Introduction

Examinations are held by Training Providers who have been running training courses for the BASIS Certificate in Crop Protection in various parts of the UK. The examination is divided into four sections, all of which must be passed. They are:

- a) multi-choice question paper
- b) practical identification test
- c) project
- d) field station and panel vivas

### Overall Standard for Examination

The BASIS certificate was originally aimed at pesticide salesmen and advisers within the distributor/manufacturer trade, and independent advisers. However, since the inception of the various assurance schemes, there has been an upsurge of interest from farmers, growers and other organisations to obtain the BASIS qualification.

The overall aim of the examination is to determine whether candidates have understood the basic principles relating to pesticides, detailed within the BASIS syllabus. Candidates who successfully pass the BASIS Certificate in Crop Protection cannot necessarily classify themselves as "experienced" advisers; this will depend on the individual's experience or will come with time within the industry. The examination panel must be sure of candidates' ability, not only to grasp the basic principles of Crop Protection, but also that they are considered to give safe recommendations and understand the environmental issues involved, along with relevant current legislation.

## THE EXAM

### **Multi-Choice Question Paper**

Questions for the paper have been submitted by the industry and are validated by a Technical Panel. The paper consists of 70 multi-choice questions to be completed within two hours. Four answers are given for each question and in each case only one is correct. Candidates are examined on all five modules of the BASIS syllabus.

Pass mark for this section - 70%

### **Practical Identification Test**

Candidates are required to identify common weeds and pests either in an examination room or a laboratory.

Pass mark for this section - 85%

### **Project**

Candidates are required to present a project, guidelines for which are given on pages 10 - 13. The project must be sent to the examination centre at least six weeks prior to the examination. The aim of the project is not to produce an academic thesis but a document which will be of practical use to the candidate in his/her future work with pesticides within the crop protection industry, applicable to aquatic weed control and application of pesticides in or near water.

Pass mark for this section - 60%

### **Field Station and Panel Viva**

#### a) Field Station Viva

All candidates are expected to have practical knowledge of recommendations, application, storage and legislation appropriate to pesticides as outlined in the modules within the BASIS syllabus. All candidates will be tested by representatives of the industry in the field situation. Books and back-up materials are not required but candidates should be able to tell the examiner where they would seek the necessary information should the need arise.

There will usually be two vivas, one in a pesticide store.

Marks from all 'Field Stations' are taken into account when assessing a candidate's ability.

## b) Viva Panel

The final section of the examination involves candidates meeting the people they will have met in the practical 'Field Stations'. The purpose of this section is to enable the panel to make a final assessment of the candidate as a competent adviser for pesticides used for aquatic weed control. All the candidate's marks from the three previous sections are available to the panel. The interview is carried out in an informal and friendly atmosphere.

Pass mark for this section - 85%

NB - Companies are reminded that candidates must have had satisfactory training and supervised field experience before entering for the BASIS examination. If in doubt as to this requirement, please contact the BASIS office.

### **General Notes**

It is essential that candidates acquire sufficient practical experience with the full range of situations applicable to the examination. Examiners must be assured that the candidate is capable of giving clear, concise and accurate recommendations.

Theoretical knowledge without an understanding of its practical application would not be sufficient for a candidate to pass the exam.

# BASIS GUIDELINES FOR FSTS CROP PROTECTION PROJECT

## Content

The project **MUST** have significant crop protection content and incorporate **clear reference to a practical situation** known to the candidate, showing actual personal practical involvement with the data generated. A literature review alone is **not appropriate**.

**Appropriate reference should be made to the environmental aspects of using pesticides and to environmental safeguards.**

Surveys of agricultural practice are acceptable but should include personal practical information gathering or verification, i.e. the raw data from a survey.

## Examples of types of project studies

- Biology and integrated control of a particular weed or pest e.g. Giant Hogweed
- Pesticide handling and pesticide application (relating to a real-life situation) e.g Use of pesticides near water, effects of water volume and forward speed on efficacy, storage of pesticides, selection of an appropriate pesticide applicator.
- Evaluation and use in commercial practice of a new pesticide or new use of a pesticide.
- Pest/weed resistance to individual or groups of pesticides.

The above are suggestions only; there are many others that candidates may choose.

## Structure

Executive Summary	Main points identified - bullet points
Introduction	Background to the project
Aims	Statement of the aims
Report	The main body of the project, this should include: - technical information relevant to the topic including references - details of field observations/trials etc.
Conclusion	Interpretation of the report findings
References & Appendix	List of the sources used  <i>eg. Information references / sources</i> <i>Gill &amp; Vear - Agricultural Botany</i> <i>CPA - Avoidance of Water Contamination</i> <i>BCPC - The UK Pesticide Guide 2005</i> <i>etc.</i>

Full use should be made of relevant photographs, diagrams, illustrations etc.

As a guide the project should be at least 3000 words in length, but not more than 5000. (i.e. probably 10-15 sides of A4)

The project should be all the candidate's own work. Any trials, results or data not collected by the author should be clearly credited.

It is expected that the project will be typed. Please note that projects will probably be returned after they have been marked, but BASIS reserves the right to retain some projects for reference, external verification and modulation as required.

Completion date at least 6 weeks before the exam with copy to the tutor. (If there is close communication between the tutor and candidate the interval between submission and exam can be reduced).

Pass mark - 60%

Candidates who do not complete a project (and consequently no project mark is available to examiners) will not be able to sit the multi-choice exam paper. A copy of the marking sheet for each project will be kept by BASIS (Registration) Ltd.

## PROJECT MARKING SCHEME

1.	Problem clearly identified	2 points
	Relevant information found	2 points
	Difficulty of project	3 points
	Key concepts	
	Independent thought	
	Information sorted and prioritised	1 point
	Commercial information included	1 point
	Academic information included	
	<u>Total mark (out of 9)</u>	.....

2.	<u>Technical Content</u>	
	Accuracy (and appropriateness)	2 points
	<u>eg</u> Life cycles where appropriate or sprayer technology / nozzles	
	1. Explained fully	5 points
	2. Diagrammatical representation / photos / drawings	2 points
	Environmental / cultural influences	2 points
	Relevance to project	2 points
	<u>Total mark (out of 13)</u>	.....

3.	Legal accuracy	1 point
	Environmental considerations	2 points
	Relevant legislation / regulations explained	2 points
	Chemical / environmental information correct	2 points
	Environmental implications identified and explained	2 points
	<u>Total mark (out of 9)</u>	.....

4.	<u>Introduction</u>	Problem clearly identified	1 point
	<u>Executive Summary</u>	How much individual work is involved?	5 points
	<u>Report</u>	Include 1., 2. & 3.	50 points
		Also: What individual data is included?	
		How was it collected?	
		What value has it for the project?	
		What conclusions can be drawn?	
		How will it help future work?	
<u>Conclusion</u>	What has been learned?	5 points	
<u>References &amp; Appendix</u>	Diagrams, graphs and pictures	3 points	

5.	Clear / understandable	5 points
	Logical flow of thought	
	Appropriate use of diagrams / graphs / pictures	

Comments (Strengths and Weaknesses)	Total Mark (out of 100) .....

## YOUR QUESTIONS ANSWERED

- **DO I NEED TO TAKE A TRAINING COURSE IN ORDER TO SIT THE BASIS EXAMINATION?**

Not necessarily, if you feel you already have enough technical knowledge and in-field experience. However, candidates should ensure that they have been trained satisfactorily, either in-house or externally, and have had sufficient supervised field experience prior to the examination, so that they are capable of giving clear, concise recommendations for the use of crop protection products.

- **WHAT FORM DO THE TRAINING COURSES TAKE?**

That will depend on the trainer / training provider, the chosen course and on previous experience to date. Courses can run for up to a total of 10 days. This will be split up into blocks of a week at a time or perhaps day release.

- **WHERE ARE TRAINING COURSES HELD?**

Details of trainers and locality can be found listed on page 33.

- **HOW DO I APPLY TO TAKE A TRAINING COURSE?**

Contact the Training Provider of your choice and complete a training course application form. Send your application to your chosen training provider.

- **IS IT POSSIBLE TO OBTAIN THE QUALIFICATION THROUGH CORRESPONDENCE OR EVENING CLASSES?**

A distance learning course is available for overseas candidates though not at the moment for those in the UK.

- **WHEN AND WHERE ARE EXAMINATIONS HELD?**

Examinations are held when there are sufficient numbers to make them viable, usually following a training course and at a venue chosen by the training provider.

- **WHAT DOES THE EXAMINATION ENTAIL?**

Details can be found in this booklet on pages 8 - 10.

- **IF I FAIL THE EXAMINATION, CAN I RE-SIT?**

Yes you can re-sit the exam; however, BASIS examinations are accredited on the Higher Education qualifications framework. One consequence of this is that we need to ensure procedures are in place to improve candidates' chances of success in subsequent examinations following a previous failure.

Where candidates have been examined unsuccessfully on two occasions, they will be required to retrain before attempting the exam for a third time.

Candidates and trainers will be required to complete a form to confirm that they have retrained, particularly covering areas that were identified as 'areas of weakness' at previous exams.

The form should be presented to the exam Chairman at the third exam attempt. Failure to confirm that retraining has taken place will result in a refusal to conduct the viva examination and subsequent 'no result' for the exam.

Please help us to help you by asking your training provider to evaluate your training needs and undertake the training required to ensure you can pass the exam.

Those candidates wishing to go forward for the 'BASIS Diploma and later the HAUC Diploma in Agronomy with Environmental Management should be aware that only four attempts at any examination will be permitted if that course is included as a qualification module for the diploma(s).

- **WHAT IF I FAIL ONE PART OF THE EXAMINATION BUT PASS THE OTHER?**

If you fail the project but pass everything else you will only have to re-submit the project. However, if you fail any part of the written, practical or Field & Panel vivas, you must re-sit all parts of the exam again.

- **IF I APPLY FOR A JOB WITHIN THE PESTICIDES INDUSTRY DO I HAVE TO HOLD THE BASIS CERTIFICATE OR HAVE EXEMPTION FROM IT?**

If you have not previously been employed by a distributor you have up to three years from entering the industry in which to become qualified. During that time you must work under the supervision of a certificate holder. Anyone involved in the sale or supply of pesticides must hold the BASIS Certificate of Competence.

- **WHAT IS MEANT BY "WORKING UNDER SUPERVISION"?**

All good trading companies will require their new personnel to have an initial period of training, accompanied by a qualified member of their staff. There will come a time when the company will have to allow the representative to work on his own. Until such time that he/she becomes qualified, all advice given and sales made by the new representative must be monitored by a qualified person who should countersign their sales documentation.

- **HOW DO I APPLY TO SIT THE BASIS EXAMINATION?**

Complete an examination application form and return it to the Training Provider of your choice. You will be notified when an examination is to take place. (Those attending a BASIS training course will automatically be entered for the examination and so do not need to apply separately).

- **WHEN WILL I RECEIVE MY EXAMINATION RESULTS?**

We aim to issue results and feedback within 4 weeks from the date of examination. **Please note results will not be given over the telephone.**

## OBJECTIVE SYLLABUS

The syllabus has been designed to allow individual sections of training to be treated as separate units for training purposes. This will permit the choice of the most appropriate time of year in which to undertake such training. Some indication of time required to cover each section of the syllabus is given in the contents page of this booklet. Those concerned with the training will thus be able to assess the depth of treatment for each subject and establish their training programme accordingly.

The syllabus is aimed at those individuals who are involved in the advice, sale or supply of pesticides in the aquatic sector. Those covered by this section would thus include:

Pesticide manufacturers and suppliers  
Pesticide distributors  
Contractors who also give advice when applying pesticides  
Advisers and those recommending pesticides, including Environment Agency staff involved in granting licences to spray in or near water

### MODULE 1 - PLANT GROWTH AND DEVELOPMENT

#### 1.1 Competence

To ensure an understanding of the factors which contribute to the growth of plant material in the aquatic environment in the UK.

#### 1.2 Performance Criteria

Candidates must be able to:

- understand the factors which contribute to the production of plants in the aquatic environment.
- understand the production of the main plant groups in the aquatic environment.

### 1.3 Essential Knowledge & Skills

Candidates must have the ability to:

- appreciate and explain the process of plant growth and development.
- recognise major factors affecting plant growth.
- assess plant quality.
- recognise the significance of the particular plant groups and their role in the aquatic environment.
- be familiar with the main plant groups and their characteristics.
- be aware of the significance of water and substrate types.
- identify major growth periods for particular aquatic plant groups.

## **MODULE 2 - RECOGNITION, BIOLOGY AND CONTROL OF WEEDS**

### **2.1 Competence**

Develop an ability for accurate weed identification and the evaluation of safe and appropriate control measures.

### **2.2 Performance Criteria**

Candidates must be able to:

- provide a basis for accurate weed identification
- develop an understanding of weed biology.
- provide an appreciation of the reasons for weed control, and their evaluation.
- provide a knowledge and understanding of methods available for weed prevention and control.
- develop a knowledge of major weed problems and an understanding of the choice and integration of suitable and economical control treatments.

### **2.3 Essential Knowledge & Skills**

Candidates must have the ability to:

- understand the major methods of aquatic plant reproduction.
- understand the causes of weed infestation in aquatic situations.
- describe the main features of aquatic plant reproduction and physiology that contribute to the dissemination and successful establishment of weed species.
- understand the importance of vegetative regeneration of weeds in aquatic situations.
- interpret the seasonal and locational appearance of major weed species.
- understand the impact weed growth can have on a range of aquatic environments.

- recognise major weeds according to location.
- examine and assess weed problems and maintain records of infestation.
- select and justify appropriate control measures.
- recognise which herbicides will reduce weed populations and which herbicides can be legally and safely applied for specific problems.
- calculate suitable dose rates and justify the timing and methods of application for specific weed problems.
- predict the weed control strategies which are necessary to reduce weed populations progressively.
- classify the main types of control measures used in the aquatic environment, such as mechanical, environmental, biological and chemical for particular aquatic environments, with particular reference to the impact such measures may have.
- identify and name botanical features used for recognition of juvenile and mature plants.
- recognise different stages of plant growth.
- use an identification key successfully.
- recognise major aquatic plant species associated with different water types.
- describe the nature of weed competition and predict the likely outcome of the level of weed infestation.
- understand the significance of particular weed and aquatic plant species in the aquatic environment.
- demonstrate an awareness of legislation relating to noxious and notifiable weeds.
- explain the significance of particular cultural practices to the prevention, reduction and control of weed problems.
- recognise the competitive abilities of aquatic plants.
- classify the main types of chemical control measures and major groups of chemical materials.

- justify the choice of methods for the control of particular types of weed species and weed infestations.
- recognise the advantages and disadvantages of the control measures available.
- appraise the relative cost of the various control measures.

## **MODULE 3 - COMPOSITION, ACTIVITY AND PERSISTENCE OF CROP PROTECTION CHEMICALS, AND BIOLOGICAL AGENTS**

### **3.1 Competence**

To develop an understanding of the nature of crop protection chemicals and biological control agents.

### **3.2 Performance Criteria**

Candidates will be able to:

- ensure the correct use of technical terms.
- understand the composition of crop protection materials.
- develop an awareness of the use of biological control agents.
- describe the biological activity of important groups of chemicals.
- provide an understanding of factors influencing persistence.
- provide an understanding of the development of tolerance to certain crop protection materials by target organisms.

### **3.3 Essential Knowledge & Skills**

Candidates must have the ability to:

- explain the use of chemical names, BSI approved common names and proprietary names for crop protection materials.
- classify crop protection materials into functional, chemical and mode of action categories.
- accurately define terms used in relation to chemical and non chemical treatments for aquatic plants.
- identify formulations in the form of emulsifiable concentrates, wettable powders, suspension concentrates, dusts, granules and gels.

- understand the basic functions of additives, such as surfactants, dilutants and dispersing, dispensing and emulsifying agents.
- explain the significance and limitations of different formulations in relation to application, activity, selectivity, toxicology, persistence and environmental effects.
- explain the importance of compliance with manufacturers' instructions for correct dosages and the application of particular formulations.
- describe the characteristics of biological control agents.
- compile a list of potential biological control agents, and discuss examples of successful commercial exploitation.
- outline the benefits and practical limitations of biological control.
- outline the mode of action of major groups of herbicides, molluscicides, insecticides, vertebrate poisons, fungicides and plant growth regulators.
- develop a knowledge of certain properties of materials which influence their biological activity, selectivity and human toxicity.
- describe the likely influence of weather factors on the effectiveness and behaviour of particular materials.
- describe the influences of water type on the behaviour of crop protection materials.
- identify types of water and the significant properties of those water types.
- explain the importance of recognising the correct stages of development of aquatic plants, in relation to maximising the effectiveness of treatments.
- recognise the susceptibility of particular aquatic plants to phytotoxic damage by certain materials.
- explain the limitations of particular materials.
- understand the importance of storage conditions on the activity of particular materials.
- explain the possible reasons for the ineffectiveness of chemical treatments in particular situations and seasons.

- give justification for the selection of certain materials for particular situations.
- apply knowledge of factors influencing the behaviour of particular crop protection materials to their possible persistence in the environment.
- recognise the significance of approved and recommended uses of particular materials in relation to persistence.

## MODULE 4 - APPLICATION OF CROP PROTECTION CHEMICALS

### 4.1 Competence

To develop an understanding of the equipment and techniques for applying crop protection materials.

### 4.2 Performance Criteria

Candidates will be able to:

- develop an awareness of formulations in relation to application treatments.
- provide a knowledge of the types, and use, of equipment for spray application.
- provide a knowledge of correct sprayer use and maintenance and accurate application procedures.
- develop an appreciation of potential hazards associated with application and encourage safety consciousness.

### 4.3 Essential Knowledge & Skills

Candidates must have the ability to:

- develop a knowledge of the various types of formulations of crop protection materials.
- recognise the significance of formulation in relation to the choice of application equipment and method of delivery of the material.
- describe the practical limits of the accuracy of placement of particular materials.
- give details of types of application treatments.
- describe vehicles utilised for the application of crop protection materials.
- recognise the nature of plant surfaces and their influence on the degree of retention and distribution of chemicals.

- explain the importance of factors such as droplet size, wetters and oil additives to the retention and distribution of chemicals on plant surfaces.
- develop a knowledge of the various types of spray application equipment, including specialised granule, spray and gel applicators.
- develop a knowledge of the hydraulic circuitry of sprayers, including ON/OFF systems, agitators, anti-drip devices, filters, positions and types of valves, filling systems and types of pumps.
- identify and describe types of nozzles.
- describe equipment for ultra-low volume, and controlled-droplet application.
- understand the interaction of factors such as pressure, nozzle size and type and vehicle speed on droplet size and coverage.
- identify major faults.
- calibrate sprayers.
- understand maintenance of spray equipment.
- describe, calibrate and maintain hand-operated equipment.
- outline procedures for ensuring correct spray output.
- explain the significance of bout-marking devices for accurate spray placement.
- describe methods of improving the accuracy of spray application.
- describe the calibration of granule applicators.
- recognise symptoms in aquatic plants of incorrect spray application.
- identify potential hazards in maintaining application equipment.
- describe safe procedures for the handling of materials and their preparation for application.
- describe procedures for ensuring the safety of operators during the application of crop protection materials.
- recognise safe procedures for protecting the general public and environment from potential hazards during the application of crop protection materials.

## **MODULE 5 - SAFE USE, HANDLING, TRANSPORT AND STORAGE OF CROP PROTECTION CHEMICALS**

### **5.1 Competence**

Develop an appreciation of the hazards of crop protection chemicals, to encourage safety consciousness and an awareness of legal obligations.

### **5.2 Performance Criteria**

Candidates will be able to:

- ensure a thorough understanding of the human hazards presented by pesticides and the circumstances in which poisoning may occur.
- develop an awareness of the harmful effects of pesticides on the environment and encourage a willingness to minimise such effects.
- understand the obligations and requirements of pesticide legislation and registration schemes.
- encourage an awareness of the importance of safe practices and a knowledge of the procedures and precautions that should be adopted.

### **5.3 Essential Knowledge & Skills**

Candidates must have the ability to:

- identify the routes of entry of pesticides into the human body.
- define the terms oral toxicity, dermal toxicity and LD50.
- identify, from a list of common aquatic pesticide materials, those which are most toxic to man.
- identify the application procedures and formulations likely to give rise to the greatest contamination of operatives clothing, skin and respiratory tract.

- recognise the influence of previous exposure on the toxicity of anti-cholinesterase compounds.
- recognise the hazards associated with uncontrolled access to aquatic pesticide operations, materials and stores, especially by children and domestic animals.
- give an explanation of the hazards associated with the transfer of pesticides into incorrectly labelled containers.
- explain the possible route of pesticide residues to the public.
- identify the factors that affect the level of pesticide residues in water.
- define the terms food chain, food web and ecosystem.
- identify important wildlife refuges in aquatic environments and adjacent areas.
- explain the possible effects of pesticides on aquatic animals and micro-organisms.
- show how herbicides may affect the population density of wild plants, animals and birds.
- explain how insecticides may affect the population density of animals and fish through direct toxicity and food chain effects.
- explain how pesticides may cause pollution of water and damage to aquatic organisms, terrestrial animals and crops.
- describe the circumstances in which insect pollinators may be killed by pesticides.
- identify the major obligations of employers, employees and the self employed under:
  - a) the Control of Substances Hazardous to Health Regulations (COSHH)
  - b) the Health and Safety at Work Act, 1974
  - c) Poisons Act 1972 - Poisons List Order 1982 and the Poison Rules 1982
  - d) Water Resources Act 1991
  - e) the Control of Pollution Act, 1974
  - f) Ground Water Regulations 1998
  - g) Water Framework Directive

- identify the major provisions and obligations of:
  - a) the Food and Environment Protection Act 1985
  - b) Control of Pesticides (Amendment) Regulations 1997
  - c) BASIS (Registration) Limited
  - d) the Local Environmental Risk Assessment for Pesticides (LERAP) arrangements
- explain the importance of appropriate choice of chemicals, mixtures, formulations and methods of application in reducing risks to people and the environment.
- describe the precautions to be taken during the transport of pesticides.
- describe safe specifications for a pesticide store.
- emphasise the importance of limiting access to pesticide stores, and operations.
- relate the regulations for protective clothing requirement to choice of chemical formulation, method of application and the environment in which application will take place.
- demonstrate the safety precautions taken during the mixing of pesticides and filling application equipment.
- describe working practices that will minimise contamination of the operatives and minimise drift.
- describe safe methods of disposal of unwanted pesticides, protective clothing and empty containers.
- describe decontamination procedures for clothing and skin.
- understand the relationship between the access of people and livestock to treated areas with the risks associated with chemicals of varying persistence and toxicity.
- describe the steps that should be taken if human poisoning is suspected.
- understand the legal obligations concerning consumers under the Food Safety Act 1990.
- understand the legal obligations concerning the environment.

## FSTS - INCORPORATING ICM

### SAMPLE MULTI-CHOICE QUESTIONS FOR THE FSTS EXAMINATION

The following sample questions give a guideline of the type and presentation of questions candidates will have to answer when taking the FSTS examination. They are purely intended as a guide and consist of superseded questions from actual past papers. The multi-choice question paper consists of 70 questions including 10 ICM questions and covers all the areas listed in the attached syllabus.

1. Which ONE of the following produces an ovoid seed-pod containing tablet-like dark seeds?
  - a Yellow Flag (*Iris* spp)
  - b Sweet Flag (*Acorus* spp)
  - c Bur-reed (*Sparganium* spp)
  - d Sedge (*Carex* spp)
  
2. What is the minimum protective clothing that must be worn by an operator when spraying glyphosate for the control of emergent weeds?
  - a minimum PPE as specified on product label
  - b protective gloves and face-shield
  - c protective overalls, gloves and face-shield
  - d protective overalls, gloves, face-shield and mask
  
3. The nozzle which produces a swirling sheet of spray which subsequently shatters into fine droplets is
  - a Anvil jet
  - b Flat fan
  - c Hollow cone
  - d Tilt jet
  
4. Which ONE of the following has members of the genus poisonous to humans?
  - a *Oenanthe*, Water Dropwort
  - b *Zannichellia*, Horned Pondweed
  - c *Hottonia*, Water Violet
  - d *Myriophyllum*, Milfoil

5. Which ONE of the following is a submerged, non-rooted plant?
- a Starwort
  - b Water-crowfoot
  - c Water-milfoil
  - d Hornwort
6. What equipment would be suitable for the correct application of Midstream?
- a Fontan knapsack blower
  - b Wessex electric broadcaster
  - c Claxton knapsack applicator
  - d Cooper-Pegler knapsack applicator
7. In which of the following soil types is leaching of pesticides most likely to occur?
- a fine sand
  - b silty clay loam
  - c clay
  - d coarse sand
8. What is the best time to cut hedges to encourage birds?
- a Cutting in spring
  - b Cutting in summer
  - c Cutting in autumn
  - d Cutting in late winter
9. A more flexible approach to statutory 5 metre no-spray zones is known as
- a Local Environmental Risk Assessment for Pesticides (LERAP)
  - b Buffer Area Risk Assessment for Pesticides (BARAP)
  - c Pesticide Local Environmental Risk Assessment (PLERA)
  - d Pesticide Risk Assessment for Buffer Areas (PRABA)
10. A drum of the now withdrawn chemical *dinoseb* is found at the back of a store. The correct disposal procedure is
- a pay for removal by a reputable disposal agent
  - b use in an Approved way
  - c pour into an approved soakaway and mark the site
  - d bury on waste ground, 0.8 metres deep and mark the site.

## BASIS APPROVED TRAINERS

The following Colleges, Trainers and Training Providers are successfully running Aquatics examinations and have been accepted as BASIS Approved Trainers for Aquatics

### **Sparsholt College**

Sparsholt  
WINCHESTER  
Hampshire  
SO21 2NF

Contact: Liz Thornton

Tel: 01962 797213

Email: [elizabeth.thornton@sparsholt.ac.uk](mailto:elizabeth.thornton@sparsholt.ac.uk)

Web: [www.sparsholt.ac.uk](http://www.sparsholt.ac.uk)