

**BASIS Certificate in Crop Protection (Stored Combinable Crops)**  
**Objective Syllabus**

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## **BASIS CERTIFICATE IN CROP PROTECTION (Stored Combinable Crops) SYLLABUS & INFORMATION**

The BASIS Certificate in Crop Protection (Agriculture) 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 and suppliers.

"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 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 (Stored Combinable Crops) is intended for those who will only sell, and/or give advice, on the use of pesticides that are used in stored combinable crops, or used for the treatment of the fabric of combinable crops storage buildings. It does not cover sales of, or advice regarding, pesticides used in growing crops. Anyone who will sell or advise on pesticides used in the field must obtain the broader BASIS Certificate in Crop Protection (Agriculture, Commercial Horticulture or Vegetables).**

This booklet is designed to help those involved with training people to meet the 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. 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.

It is recommended that a training course of at least two days is undertaken prior to the examination day. In addition, it is essential that candidates are issued with the course work book (available from BASIS [Registration] Ltd) at least two weeks prior to the training. Candidates will need to complete the questions in the work book to meet the required level of knowledge.

The work book is designed to be used as part of a training course.

By attempting to answer the questions at the end of each module in the work book candidates will increase their knowledge and understanding. Not all of the information they will need is in this book, some will come from the training course and some additional work is also necessary. A list of useful websites and publications is included in the work book.

Courses are offered for the BASIS Certificate in Crop Protection (Stored Combinable Crops) by the BASIS Approved Trainers listed in this booklet (Page 21).

## EXAMINATION GUIDELINES

### Introduction

Examinations are held by Training Providers who have been running training courses for the BASIS Certificate in Crop Protection (Stored Combinable Crops) in various parts of the UK. The examination consists of:

- a) multi-choice and short-answer question paper

Pass mark - 70%

### Question Paper

Questions for the paper are validated by a Technical Panel. The paper consists of 50 multi-choice questions and three short answer questions to be completed within two hours

NB - No project is required for the Stored Combinable Crops certificate.

### Overall Standard for Examination

The BASIS certificate was originally aimed at pesticide sales staff 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 (Stored Combinable Crops) syllabus. Candidates who successfully pass the BASIS Certificate in Crop Protection (Stored Combinable Crops) cannot necessarily classify themselves as "experienced" advisers; this will depend on the individual's experience or will come with time within the industry.

## OBJECTIVE SYLLABUS

The syllabus has been designed to allow individual sections of training to be treated as separate units for training purposes.

### MODULE 1 - INTEGRATED STORE MANAGEMENT. STORING COMBINABLE CROPS TO MEET MARKET REQUIREMENTS

#### 1.1 Competence

Demonstrate knowledge and understanding of the concept and importance of Integrated Store Management. Explain the role of good combinable crop store management in meeting the requirements of different end markets.

#### 1.2 Performance Criteria

Candidates must be able to:

- define Integrated Store Management.
- show understanding of the importance of Integrated Store Management.
- identify the components of Integrated Store Management.
- state good sources of information on Integrated Store Management.
- demonstrate an understanding of the requirements of different end markets
- demonstrate a knowledge of the role, operation, and requirements of crop assurance schemes
- show understanding of the importance and requirements of Food Safety legislation
- appreciate the range of factors beyond the control of a store manager which affect whether end market requirements are met. For example pest and disease problems in the crop before harvest.
- explain the roles of hygiene, monitoring, calibration and recording in good store management.

- show an understanding of the importance of store design, construction and maintenance in the control of storage problems.

### 1.3 Essential Knowledge & Skills

Candidates must have the ability to:

- understand why an integrated approach to grain store management is necessary to maintain quality of stored combinable crops
- recognise the major factors influencing the quality of stored combinable crops
- use all appropriate criteria to assess the threats to stored combinable crop quality in a particular system or store.
- understand the principles of monitoring and managing stored combinable crop temperatures
- explain the critical issues to be considered when cooling combinable crops post harvest
- understand the principles of monitoring and managing moisture content of stored combinable crops.
- explain the critical issues to be considered when drying combinable crops post harvest.
- outline key differences in the management of stored oilseeds, cereals and pulses.
- identify the features of good storage systems .
- describe practical steps which should be taken to prepare a store and crop handling equipment prior to harvest .
- explain how the design of buildings and handling systems affects the ability to manage quality during storage of combinable crops.
- explain the importance of producing safe produce that meets quality specifications and outline key aspects of a store management plan which contribute to this.
- explain the roles of assurance schemes and of legislation in achieving food safety.
- identify specific storage and handling issues which represent particular food safety hazards. Explain measures required to eliminate the hazard or minimise the risk.

## MODULE 2 - RECOGNITION, BIOLOGY AND CONTROL OF STORAGE PESTS

### 2.1 Competence

- Ability to recognise pests and pest damage, to anticipate and prevent pest problems and to choose safe and appropriate control measures.

### 2.2 Performance Criteria

Candidates will be able to:

- state the most common invertebrate pest species found in combinable crop stores in the UK.
- demonstrate an awareness of the factors that determine the occurrence of pest damage and its importance.
- demonstrate knowledge and understanding of the methods available to prevent or control pest damage.
- recognise the important pests of stored combinable crops. Identify, anticipate and prevent the damage each may cause, and select the most appropriate control measures, or combination of measures, for specific circumstances.
- show knowledge of the characteristics and life cycles of those groups of animals that include important combinable crop storage pest species. Also relate a pests biology and life-cycle to effective control measures
- explain the problems caused by pests of stored combinable crops.
- demonstrate knowledge of the importance of vertebrate pests, and explain the practical measures used to exclude and manage them

### 2.3 Essential Knowledge & Skills

Candidates must have the ability to:

- diagnose the causes of stored combinable crop damage by identifying symptoms, signs and/or pests.

- relate pest incidence to particular storage conditions and management practices.
- apply knowledge of the factors affecting pest incidence to the monitoring of pest species and the prediction and prevention of pest damage.
- identify legislation designed to minimise the importation, dissemination and multiplication of pests.
- select store management practices that may be used to minimise pest damage.
- identify pest damage which cannot be controlled by store management or by post-harvest treatment, e.g. bruchid beetle damage
- choose appropriate control measures, including pesticide products, for particular pest problems in store.
- explain the advantages of integrating pest control methods by reference to specific examples.
- recognise mites and the relevant orders of insects.
- describe typical life cycles of mites and insects.
- identify the special features of bird and mammal biology that contribute to pest problems caused by these animals.
- identify the major pests, pest damage symptoms and signs of pests of stored combinable crops.
- recommend and justify specific control measures.
- calculate appropriate dose rates for particular pesticides, and justify the timing and methods of application for specific pest problems.
- explain the importance of following pesticide label requirements for intervals between treatment and movement or marketing of combinable crops .
- describe the records which should be kept and the information which should be given to purchasers of combinable crops, when pesticides have been used
- explain what is meant by resistance and give an example of a grain storage pest which exhibits resistance to organophosphate insecticides

## **MODULE 3 - RECOGNITION, BIOLOGY AND CONTROL OF STORAGE DISEASES**

### **3.1 Competence**

Recognition of disease symptoms, the evaluation of disease problems and choice of appropriate control measures.

### **3.2 Performance Criteria**

Candidates will be able to:

- identify microbial growth in stored combinable crops
- explain the significance of microbial growth and demonstrate awareness of the methods of assessment and evaluation.
- show an understanding of the biology of common micro-organisms which can develop in stored combinable crops
- demonstrate an understanding of methods available for microbial control, reduction and prevention.
- Explain the importance of mycotoxins and detail how good storage practice can contribute to minimising mycotoxin risk and so meeting end-user requirements

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

Candidates must have the ability to:

- recognise the signs of microbial growth in stored combinable crops
- explain the significance of microbial growth in stored combinable crops.
- discuss HGCA guidelines to minimise risk of mycotoxins in cereals and demonstrate detailed knowledge of the contribution which good storage practice makes
- assess and record microbial damage in stored combinable crops.
- demonstrate awareness of the economic significance of damage.

- explain the concerns for animal and human health where microbial growth occurs in stored combinable crops.
- relate conditions influencing the survival, build-up and dispersal of fungi and bacteria to the development of storage problems.
- explain environmental influences on the development of fungal and bacterial growth in stored combinable crops.
- use a knowledge of the factors influencing microbial development to recommend specific measures to manage and prevent microbial growth.
- select and justify appropriate measures for prevention and treatment of microbial contamination of stored combinable crops.

## **MODULE 4 - COMPOSITION, ACTIVITY AND PERSISTENCE OF CROP PROTECTION CHEMICALS, AND BIOLOGICAL AGENTS**

### **4.1 Competence**

To develop an understanding of the nature of crop protection chemicals used in combinable crop storage

### **4.2 Performance Criteria**

Candidates will be able to:

- ensure the correct use of technical terms.
- understand the composition of relevant crop protection materials.
- develop an awareness of the use of biological control agents and their limitations.
- describe the biological activity of important groups of insecticides.
- explain why persistence is an important issue
- show an understanding of factors influencing persistence.
- understand factors influencing the development of resistance to pesticides materials by target organisms.

### **4.3 Essential Knowledge & Skills**

Candidates must have the ability to:

- explain the use of chemical names, approved common names and proprietary names for relevant crop protection materials.
- classify relevant crop protection materials into functional, chemical and mode of action categories.
- accurately define terms used in relation to chemical treatments.

- describe the types of formulations used for grain storage insecticides and understand the significance of formulation for efficacy, safety, packaging and ease of use.
- understand the basic functions of additives, such as surfactants, diluents and dispersing, dispensing and emulsifying agents.
- explain the significance and limitations of different formulations in relation to application, activity, selectivity, toxicology and persistence.
- explain the importance of compliance with manufacturers' instructions for correct application of particular formulations.
- outline the mode of action of major groups of acaricides, insecticides and rodenticides.
- show a knowledge of the properties of materials which influence biological activity, selectivity and human toxicity.
- describe the likely influence of environmental factors such as temperature and moisture on the effectiveness and behaviour of particular materials.
- explain the limitations of particular materials.
- understand the importance of pesticide storage conditions on the activity of products.
- explain the possible reasons for the ineffectiveness of chemical treatments in particular situations. For example, poor coverage.
- give justification for the selection of certain materials for particular situations.
- recognise the significance of approved and recommended uses of particular materials in relation to persistence.
- recognise the significance of minimum time intervals between application of particular materials and the removal from store for movement or use.
- show awareness of residue sampling programmes and knowledge of the setting and enforcement of maximum residue levels
- give examples of resistance of target organisms to particular pesticides.
- outline how resistance in target organisms develops.

- explain measures for limiting the development of resistance.
- recommend alternative materials in situations where resistance exists, or is likely to develop.
- detail alternative strategies of control to help manage problems of resistance, and prevent its possible development.

## **MODULE 5 - APPLICATION OF CROP PROTECTION CHEMICALS USED FOR THE TREATMENT OF STORED COMBINABLE CROPS AND STORAGE BUILDINGS**

### **5.1 Competence**

To develop an understanding of the equipment and techniques for applying grain storage pesticides

### **5.2 Performance Criteria**

Candidates will be able to:

- develop a knowledge of formulations in relation to application treatments.
- demonstrate knowledge of the types, and use, of equipment for application.
- show awareness of the need for correct applicator use and maintenance and accurate application procedures.
- appreciate potential hazards associated with application and encourage safety.

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

Candidates must have the ability to:

- develop a knowledge of the various types of formulations of products.
- 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 and coverage of particular materials.
- give details of types of application treatment.
- describe equipment used for application.
- recognise the nature of grain and seed surfaces and also built surfaces, and their influence on the degree of retention and distribution of chemicals.

- explain the importance of factors such as droplet size and spray volume to the retention and distribution of chemicals on surfaces.
- demonstrate a knowledge of the various types of application equipment.
- understand the interaction of factors such as pressure and nozzle size and type on droplet size and coverage.
- identify major faults
- calculate the appropriate amount of product to be recommended in different situations
- understand the need for carrying out and recording maintenance and calibration of equipment.
- recognise products requiring specialist application
- identify potential hazards in carrying out application and 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, the consumer and the environment from potential harm.
- state the appropriate training and certification for operators

## **MODULE 6 - SAFE USE, HANDLING, TRANSPORT AND STORAGE OF CROP PROTECTION CHEMICALS USED FOR THE TREATMENT OF STORED COMBINABLE CROPS AND STORAGE BUILDINGS**

### **6.1 Competence**

Demonstrate knowledge of the hazards of crop protection chemicals, to encourage safety and an awareness of legal obligations.

### **6.2 Performance Criteria**

Candidates will be able to:

- show a thorough understanding of the human hazards presented by relevant pesticides and the circumstances in which problems may occur.
- demonstrate awareness of the potential for harmful effects of pesticides on the environment and knowledge of how hazards can be eliminated and risks minimised.
- outline the obligations and requirements of pesticide legislation at EU and national level
- encourage safe practices and show a knowledge of the procedures and precautions that should be adopted.

### **6.3 Essential Knowledge & Skills**

Candidates must have the ability to:

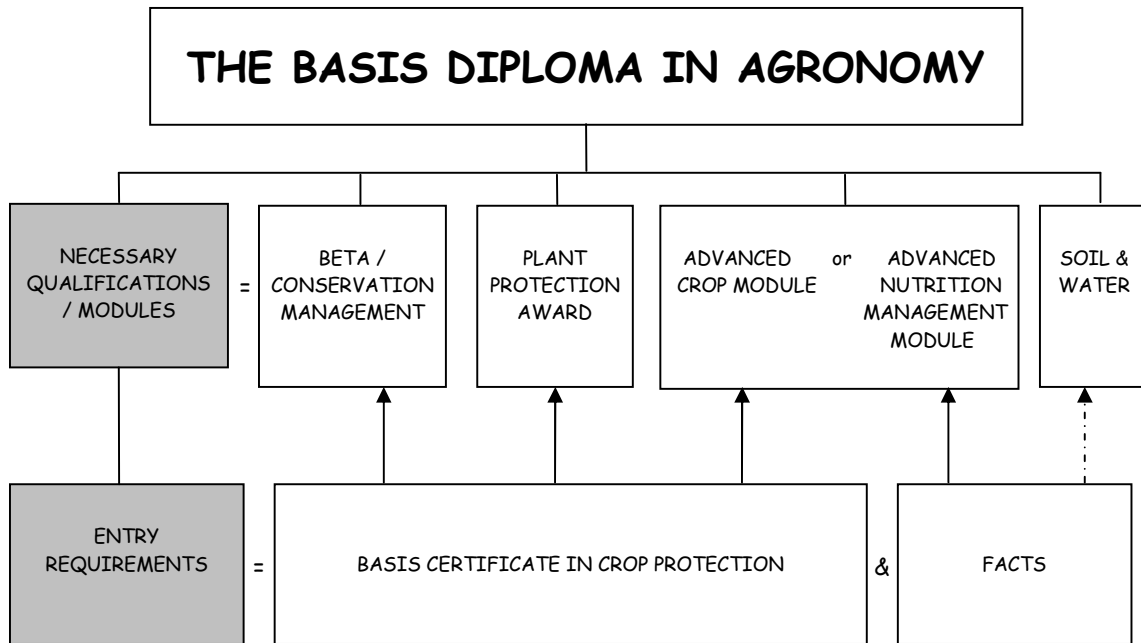
- identify the application procedures and formulations likely to give rise to the greatest contamination of operatives clothing, skin and respiratory tract.
- recognise the influence of previous exposure on the toxicity of anti-cholinesterase compounds.
- recognise the hazards associated with uncontrolled access to crop protection 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 consumer.
- identify the factors that affect the level of pesticide residues in food.
- explain how harm could be caused by use of approved products. For example, through incorrect application or dose rates.
- understand how pesticides may come in contact with stored combinable crops not deliberately treated with them.
- show awareness of the purpose of the Authorisation Directive 91/414/EEC, FEPA 1985, COPR 1986 (As amended) and PPPR 1995 (as amended).
- outline the authorisation and approval process at EU and national level
- explain the major legal provisions controlling the sale, supply, use and advertising of pesticides.
- use a pesticide product label and material safety data sheet to give appropriate advice on safe and effective use of the product.
- show awareness of EC Regulation 396/2005 (EC) and be able to define what is meant by MRL. Explain the purpose of MRLs and outline how they are enforced.
- understand the importance of and be aware of the relevant content of the Code of Practice for Using Plant Protection Products and also the Code of Practice for Suppliers of Pesticides to Agriculture, Horticulture and Forestry (the "Yellow Code").
- show awareness of the Health and Safety at Work Act 1974 and the COSHH Regulations.
- understand the importance of a COSHH assessment and the role of Material Safety Data Sheets
- use a Material Safety Data Sheet to determine information useful for a COSHH assessment
- explain the importance of appropriate choice of product and methods of application in reducing risks to people, the environment and the consumer.
- describe the precautions to be taken during the transport of pesticides.
- show awareness of best practice specifications for a pesticide store on a farm or holding.

- emphasise the importance of limiting access to crop protection stores, crop stores and operations.
- describe working practices that will minimise risk to operators
- describe best practice for waste management in relation to pesticides, protective clothing and empty containers.
- describe the steps that should be taken if accidental human poisoning is suspected and the appropriate decontamination procedures for clothing and skin.
- understand the legal obligations concerning consumers under the Food Safety Act 1990.
- show awareness of the EU Water Framework Directive 2000/60/EC and of the Water Resources Act 1991.
- explain how inappropriate use, transport or storage of pesticides could lead to water pollution
- show understanding of the consequences of water pollution.
- explain the provisions of the Poisons Act 1972 and the Poisons Rules 1982 (& Amending Orders) in relation to stored combinable crops products

## 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 training department on 01335 340857 or 01335 340854 or by e-mail to [training.courses@basis-reg.co.uk](mailto:training.courses@basis-reg.co.uk)

## BASIS APPROVED TRAINERS

The following Colleges, Trainers and Training Providers are successfully running FSTS (Stored Combinable Crops) examinations and have been accepted as BASIS Approved Trainers.

**James Christian-Ilett**

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Welton

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Lincolnshire

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