



## Higher National Unit specification

### General information for centres

**Unit title:** Plant Protection: Integrated Approaches

**Unit code:** F1JH 35

**Unit purpose:** This Unit will allow candidates to develop knowledge and skills in the control of plant and crop protection problems, utilising the principles and practices of systems which integrate control measures into the management of plants or crops. In addition, candidates will be made aware of the environmental consequences of plant and crop protection practices. The Unit is particularly useful for candidates who intend to enter the plant protection sectors of the agricultural and horticultural industries.

On completion of the Unit the candidate should be able to:

- 1 Explain the practices of Integrated Crop Management (ICM).
- 2 Explain the Principles and Practice of Integrated Plant and Crop Protection.
- 3 Apply and Evaluate the Principles of Integrated Control in Integrated Crop Management (ICM).

**Credit points and level:** 1 HN credit at SCQF level 8: (8 SCQF credit points at SCQF level 8\*)

*\*SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

**Recommended prior knowledge and skills:** It would be beneficial for candidates to have a basic knowledge of pests, diseases and weeds, preferably gained from prior completion of the Unit Plant Protection. In addition, it would be a great advantage if candidates have vocational experience in plant and crop production and have gained certification in pesticide application, eg PA1A, PA2 or PA6A.

**Core Skills:** There are opportunities to develop the Core Skills of *Problem Solving* at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

**Context for delivery:** If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

## General information for centres (cont)

**Assessment:** A combined assessment using a restricted response test, which should be supervised and closed-book could assess Outcomes 1 and 2. Each Outcome could be assessed separately in the same way but with each test being of a shorter length. Outcome 3 could be assessed using an assignment in which candidates produce a detailed written or oral report. The report should be based on an area with which the candidates are familiar, indicating the plant/crop protection methods employed and how these are delivered as an integrated approach. Alternatively, the Unit could be assessed holistically and could take the form of a detailed written report supplemented by additional restricted response questions to ensure all aspects of the Evidence Requirements of each Outcome are covered.

## Higher National Unit specification: statement of standards

**Unit title:** Plant Protection: Integrated Approaches

**Unit code:** F1JH 35

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Where evidence for Outcomes is assessed on a sample basis, the whole of the content listed in the Knowledge and/or Skills section must be taught and available for assessment. Candidates should not know in advance the items on which they will be assessed and different items should be sampled on each assessment occasion.

### Outcome 1

Explain the Practices of Integrated Crop Management (ICM)

#### Knowledge and/or Skills

- ◆ Planning, record keeping and auditing
- ◆ Soil management and crop nutrition
- ◆ Waste and pollution management
- ◆ Energy management
- ◆ Wildlife and landscape management
- ◆ Policy drivers

#### Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the key practices of integrated crop management with reference to a vocational situation
- ◆ outline the constraints placed upon integrated crop management by environmental and legislative drivers

#### Assessment Guidelines

Evidence for the knowledge and/or skills in this Outcome may be provided on a sample basis. Evidence could be generated through a supervised, closed-book assessment. Where the knowledge is sampled, the knowledge should comprise at least three of the bullet points in the knowledge and/or skills items listed above. In order to ensure that candidates will not be able to foresee the sample, the whole of the content listed must be taught and available for assessment, and a different sample is required each time the Outcome is assessed, to which candidates must give a satisfactory response.

Alternatively, evidence could be generated through an unsupervised assignment. It should cover all of the items listed in the knowledge and skills section for Outcome 1, and generate the Evidence Requirements listed above.

Outcome 1 may be assessed alone. If the assessment of this Outcome involves sampling knowledge, it may take the form of a supervised, closed-book, restricted response test of 45 minutes duration. Assessment of this Outcome could be combined with Outcome 2 using a restricted response test, which should be supervised, closed-book, and last one and a half hours.

## **Higher National Unit specification: statement of standards (cont)**

### **Unit title:** Plant Protection: Integrated Approaches

Alternatively, assessment of this Outcome could be combined with both Outcomes 2 and 3 through a single instrument of assessment as detailed under Outcome 3 below.

### **Outcome 2**

Explain the Principles and Practice of Integrated Plant and Crop Protection

#### **Knowledge and/or Skills**

- ◆ Components of integrated control
- ◆ Pest and disease prediction
- ◆ Non-chemical control
- ◆ Integration of pesticides with other control methods
- ◆ Encouragement of natural predators
- ◆ Environmental Impact
- ◆ Legislative requirements

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ explain the key principles and practices of integrated plant and crop protection with reference to a vocational situation
- ◆ explain the constraints placed upon integrated plant and crop protection by environmental and legislative requirements

#### **Assessment Guidelines**

Evidence for the knowledge and/or skills in this Outcome may be provided on a sample basis. Evidence could be generated through a supervised, closed-book assessment. Where the knowledge is sampled, the knowledge should comprise at least four of the bullet points in the knowledge and/or skills items listed above. In order to ensure that candidates will not be able to foresee the sample, the whole of the content listed must be taught and available for assessment, and a different sample is required each time the Outcome is assessed, to which candidates must give a satisfactory response.

Alternatively, evidence could be generated through an unsupervised assignment. It should cover all of the items listed in the Knowledge and Skills section for Outcome 2, and generate the Evidence Requirements listed above.

Outcome 2 may be assessed alone. If the assessment of this Outcome involves sampling knowledge, it may take the form of a supervised, closed-book, restricted response test of 45 minutes duration. Assessment of this Outcome could be combined with Outcome 1 using a restricted response test, which should be supervised, closed-book, and last one and a half hours. Alternatively, assessment of this Outcome could be combined with both Outcomes 2 and 3 through a single instrument of assessment as detailed under Outcome 3 below.

## **Higher National Unit specification: statement of standards (cont)**

**Unit title:** Plant Protection: Integrated Approaches

### **Outcome 3**

Apply and Evaluate the Principles of Integrated Control in Integrated Crop Management (ICM)

#### **Knowledge and/or Skills**

- ◆ Selection of control measures
- ◆ Integration of control measures
- ◆ Legislative requirements

#### **Evidence Requirements**

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can:

- ◆ select and evaluate integrated control measures as part of an ICM programme with reference to plant/crop protection problems

The evidence may be presented as a detailed report, or as responses to specific questions relating to a case study or a workplace situation.

#### **Assessment Guidelines**

Each candidate should be able to demonstrate all the knowledge and/or skills items listed, but it would be possible to sample them through a supervised assessment. Where the knowledge is sampled, the knowledge should comprise two of the bullet points in the knowledge and/or skills items listed above. A different sample of two of the three knowledge and/or skills items is required each time the Outcome is assessed.

Alternatively, evidence could be generated through an unsupervised assignment. It should cover all of the items listed in the knowledge and skills section for Outcome 3, and generate the Evidence Requirements listed above.

Outcome 3 may be assessed alone. If the assessment of this Outcome involves sampling knowledge, it may take the form of a supervised, closed-book, extended response test lasting one and a half hours, or a 20–30 minute oral presentation supported by an observation checklist.

Alternatively, the assessment of this Outcome can be combined with Outcomes 2 and 3 as part of a single assessment of the Unit. This could be conducted at a single assessment event lasting two hours and carried out in supervised conditions, or as an assignment conducted under unsupervised conditions. In the assessment, candidates will be required to produce a detailed report/assignment based on a case study or an actual workplace situation. Reports/assignments can be supplemented by additional questions to ensure all aspects of the Evidence Requirements are covered. The report may be presented in any suitable way. Where the Evidence Requirements specify the use of a sample, the sample will vary from assessment to assessment.

## Administrative Information

**Unit code:** F1JH 35

**Unit title:** Plant Protection: Integrated Approaches

**Superclass category:** SC

**Original date of publication:** March 2007

**Version:** 01

### History of changes:

Version	Description of change	Date

**Source:** SQA

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## **Higher National Unit specification: support notes**

### **Unit title:** Plant Protection: Integrated Approaches

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

### **Guidance on the content and context for this Unit**

The aims of the Unit are to develop knowledge and skills in the control of plant and crop protection problems, utilising the principles and practices of systems which integrate control measures into the management of plants or crops. The Unit addresses these concepts within the contexts of the production and maintenance of plants and crops for food, non-food and amenity uses. Consequently, the Unit will be vocationally relevant to candidates of all land-based courses and, in particular, agriculture, amenity and production horticulture, and landscape management.

In addition to covering the items listed in the Knowledge and/or Skills section, it would help candidates if introductory areas of water conservation (recycling, storage reservoirs, best irrigation practice) and pesticide application were addressed, particularly for candidates who have little or no experience or training in these areas. Relevant areas of Health and Safety, Legislation and Risk Assessment (eg LERAPs) should be addressed from a plant and crop protection perspective, using vocationally relevant examples to exemplify the relevance to Integrated Crop Management (ICM) issues. Integrated crop and Plant Protection should cover non-chemical control (crop rotation, hygiene, use of resistant varieties, cultivation, biological control, encouragement of natural predators), pest and disease prediction, pesticide choice, integration of pesticides with other control methods, and the environmental impact of pesticides.

This Unit is designed to provide a progression from introductory plant protection Units and complements the level 7 Unit *Pesticide Application*. In addition, it provides the necessary skills and knowledge for candidates seeking professional accreditation, eg BASIS Certification. Furthermore, it provides a necessary prerequisite for candidates wishing to study plant protection at level 9.

The content throughout the delivery of the Unit should be vocationally relevant and stress an integrated and planned approach to plant and crop protection. Candidates should be expected to use the knowledge and skills from the Unit to enable them to assess practical plant and crop protection issues in their vocational area and to recommend appropriate strategies for their control that are acceptable within a sustainable system.

### **Guidance on the delivery and assessment of this Unit**

The Unit is primarily designed to provide candidates with technical or professional knowledge and skills related to occupations in agriculture and amenity/production horticulture. It can be delivered as a stand-alone Unit or as part of a Group Award. Candidates will need to relate information learnt in the Unit to the integrated production and management requirements of the Graded Unit.

As the Unit draws together material from a wide range of other subject areas and Units, it would best be delivered after these and assessed holistically. Alternatively, it could be integrated with the delivery of appropriate Units that address related areas of content, eg soils, grassland and production Units, landscape maintenance and management.

## Higher National Unit specification: support notes (cont)

### Unit title: Plant Protection: Integrated Approaches

Delivery should place emphasis on the practical aspects of integrated plant and crop protection. It should include a range of approaches from formal lectures to discussions and library sessions, giving access to appropriate publications and appropriate websites. Computer-based packages could also be used. The Unit also lends itself well to the use of tutorials and workshops as a means of delivery, where the tutor can encourage candidates to share and develop their existing knowledge and skills as each subject area is explored.

The following texts may be helpful in the delivery of this Unit:

- ◆ Anon (1996), *'Integrated Crop Management'* Crop Protection Association
- ◆ Anon (1996), *'Integrated Crop Management — A Complete Training and Resources Pack'* Crop Protection Association
- ◆ Anon (2000), *'Environmental Best Practice in the Production of Ornamentals — A Guide for UK Growers'* DEFRA/ADAS, HMSO
- ◆ Anon (2000), *'Handbook for Integrated Farm Management'* Linking Environment and Farming (LEAF)
- ◆ Anon (2002), *'Arable Cropping and the Environment — a Guide'* DEFRA
- ◆ Anon (2004), *'The TIBRE Arable Handbook — New Options for Arable Farming'* Scottish Natural Heritage
- ◆ Anon (2006), *'Pesticides — Code of Practice for using Plant Protection Products'* DEFRA [Also available on DEFRA website ([www.defra.gov.uk](http://www.defra.gov.uk))]
- ◆ Agrios, G.N. (2005), *'Plant Pathology'* (5th Edn) Academic Press
- ◆ Alford, D.F. (1999), *'A Textbook of Agricultural Entomology'* Blackwell Science
- ◆ Alford, D.F. (2000), *'Pest and Disease Management Handbook'* Blackwell Science
- ◆ Finch, H.J.S., Samuel, A.M. & Lane, G.P.F. (2002), *'Lockhart & Wiseman's Crop Husbandry including Grassland'* (8th Edn) Woodhead Publishing Ltd
- ◆ Gwynne, D.C. & Murray R.B. (1985), *'Weed Biology and Control in Agriculture and Horticulture'* Batsford Academic and Educational
- ◆ Helyer, N., Brown, K. & Cattlin, N.D. (2003), *'Biological Control in Plant Protection'* Manson Publishing
- ◆ Lucas, J.A. (1998), *'Plant Pathology and Plant Pathogens'* (3rd Edn) Blackwell Science
- ◆ Malais, M. & Ravensburg, W.J. (1992), *'Knowing and Recognizing — The Biology of Glasshouse Pests and their Natural Enemies'* Koppert Biological Systems
- ◆ Matthews, G.A. (2000), *'Pesticide Application Methods'* (3rd Edn) Blackwell Science



## Higher National Unit specification: support notes (cont)

### Unit title: Plant Protection: Integrated Approaches

- ◆ Naylor, R.E.L. (2003), '*Crop Health — responding to Weeds, Diseases and Pests*, in *The Agricultural Notebook*' (20th Edn) Soffe, R.J., Ed.) Blackwell Science, pp. 213-230
- ◆ Readman, J. (2000), '*Controlling Weeds without using Chemicals*' HDRA/Search Press
- ◆ Thacker, J.R.M. (2002), '*An Introduction to Arthropod Pest Control*' Cambridge University Press
- ◆ Van Driesche, R.G & Bellows, T.S. (1996), '*Biological Control*' Chapman & Hall
- ◆ Walker, J. (2003), '*Weeds — an earth-friendly guide to their Identification, Use and Control*' Cassell Illustrated
- ◆ Whitehead, R. (Ed.) (2006), '*The UK Pesticide Guide 2006*' BCPC/CABI

Appropriate commercial material and WWW-sites.

#### ***Opportunities for developing Core Skills***

There are opportunities to develop the Core Skills of *Problem Solving* at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

#### **Open learning**

This Unit could be delivered by distance learning. It is probable that candidates would need to attend the centre for assessment, though this could be done in other locations under approved supervision. Where assessment is by distance learning, it is recommended that a single assessment is conducted in a supervised environment under controlled conditions.

#### **Candidates with disabilities and/or additional support needs**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).

## **General information for candidates**

### **Unit title:** Plant Protection: Integrated Approaches

This Unit addresses the management of practical plant protection problems.

Integrated Plant and Crop Protection is concerned with utilising the most appropriate methods of pest, disease and weed control to maintain levels below economically damaging thresholds. This is normally achieved by a combination of cultural, mechanical, biological and chemical methods.

Integrated Crop Management (ICM) aims to produce economic yields of high quality crops in a manner that is sensitive to and which enhances the environment for wildlife. Integrated plant and crop protection is an important component of ICM.

The aims of the Unit are to develop knowledge and skills in the control of plant and crop protection problems utilising the principles and practices of systems which integrate control measures into the management of plants or crops. The Unit addresses these concepts within the context of the production and maintenance of plants and crops for food, non-food and amenity uses. Consequently, the Unit will be vocationally relevant to candidates of all land-based courses and, in particular, agriculture, production and amenity horticulture, and landscape management.

The Unit is primarily designed to prepare you for management roles later in your careers and can also assist you in gaining professional crop protection qualifications. If you already hold a management position with crop protection responsibilities you will find this Unit of direct benefit. If you have prior experience of crop protection you should be able to make use of it during your study.

During the Unit you will learn about the control techniques for pest, weed and disease problems, and appraise these techniques for their effectiveness in controlling crop protection problems and assess how they impact on the environment and on wildlife. Plant and crop protection techniques will be studied as part of an ongoing strategy both in time, in relation to crop rotations and land use, and in space, in relation to the soil or growing medium in which the crop is grown. This approach reinforces the concept of an 'integrated' approach, where no action or decision is taken in isolation.

You will be expected to use the knowledge and skills from the Unit to enable you to assess practical plant and crop protection issues in your vocational area and to recommend appropriate strategies for their control that are acceptable within today's social climate.

In order to complete this Unit successfully, you will be required to achieve a satisfactory level of performance in one or two pieces of assessed work. The selection of assessment will depend on the mode of delivery and may consist of a written test, a detailed report or an oral presentation.