

**BASIS Certificate in Crop Protection IPM – Amenity Horticulture  
For Field, Sales and Technical Staff (FSTS)****General Information**

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**Objective Syllabus****Core Modules**

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| Module 1 | Impact of Amenity Activities on Biodiversity, the Environment and Water (½ day) | 13 |
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| Module 7 | Safe Use, Handling, Transport and Storage of Pesticides (2 days)                | 24 |

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|          |  |    |
|----------|--|----|
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|   |  |           |
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Probable training time per module is shown above in brackets. This is a guide for trainers and candidates to help structure the course training programme. The experience level of candidates, prior to starting the training course, will have a significant effect on the time required per module and trainers should plan the programme timing based on the candidates' pre-identified strengths and weaker areas.

It is expected that all candidates will have a working knowledge of the seven core modules. In depth knowledge will be required relating to the skill area module pre-selected at least 1 month prior to the exam date.

## BASIS CERTIFICATE IN CROP PROTECTION IPM AMENITY HORTICULTURE SYLLABUS & INFORMATION

This syllabus is prepared for those individuals who are involved in the advice, sale or supply of pesticides in the amenity industry. Those covered by this section would thus include:

- Contractors who sell or give advice
- Distributors who sell or give advice
- Pesticide manufacturers and suppliers
- Consultants, agents, managers, specifiers and local authority managers who are involved in pesticide sales or advice

The amenity industry includes hard surface areas, turf, amenity grass and sports areas, large public and private gardens (eg National Trust type properties), parks, forestry, aquatic and other areas where spraying is carried out. This can be by in-house or contract labour, private forestry companies, local authorities, motorway and other road verge maintenance, aquatic and dry areas and industrial site maintenance. This may include amateur gardens where contractors are employed using professional products. The control of invasive and injurious weeds is also an important area of Amenity Pesticide use.

### BACKGROUND

The BASIS Certificate in Crop Protection has been established since 1981 to provide training and certification for sellers and distributors of agrochemicals and those giving advice on their use.

For the first few years after it was introduced, the Crop Protection training and Certification was a voluntary action embraced by the major pesticide manufacturers and distributors in the UK.

In 1985 the Government passed the Food and Environment Protection Act (FEPA). This act covered all aspects of pesticides from manufacturers to users and consumers. As BASIS had several years of experience in training and certification for advisers, the Government looked at BASIS as the blueprint for some aspects of the new legislation.

In 1986 all BASIS certificates became a legal requirement under The Control of Pesticides Regulations (COPR) – a statutory instrument designed to give guidance in the FEPA implementing.

The Plant Protection Products (Sustainable Use) Regulations 2012 came into force in July 2012 to transpose the European Sustainable Use Directive, 2009/128/EC relating to the use of plant protection products. This new legislation reinforced the importance of training and certification for all pesticide distributors and advisers with new provisions for internet sales and requirements for the availability of advice at the time of sale.

This booklet is designed for candidates and their employers, trainers and training providers to offer guidance on the subject areas which need to be covered in order to achieve the required level of competence for this specific certificate.

It is essential that candidates are aware that the Crop Protection Certification will only be awarded to individuals capable of demonstrating theoretical knowledge alongside substantial practical understanding of crop protection challenges and solutions with a clear emphasis on the Integrated and Sustainable approach.

Candidates must have had satisfactory training and supervised field experience before entering for the BASIS examinations. If in any doubt, please contact the BASIS office. It is essential that candidates are very well prepared for the examination out of respect for the examination panel – advisers and top industry experts who give their time freely in order to assess the competence and professional confidence of new entrants into the industry.

Courses are offered 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.

## OTHER BASIS QUALIFICATIONS FOR AMENITY HORTICULTURE

### BETA AMENITY

A new course designed to build knowledge and skills in biodiversity and the environment relevant to Amenity Horticulture.

### ENVIRONMENTAL PESTICIDE MANAGEMENT

The protection of water and the environment are important. This course is designed for those who organise and control pesticide application, but who may not actually do the spraying. However, increasingly, spray operators who want to broaden their knowledge and earn NRoSO points are taking the course.

### FOUNDATION AWARD

This course gives an excellent grounding for those who need to know about amenity pesticides but who don't give advice. It is often used as a career development course on the way to full Amenity Horticulture qualification.

### WHISTLE BLOWING POLICY

BASIS Registration Ltd is committed to the highest standards of openness and accountability. Therefore, we expect employees, candidates and others who work with BASIS, who have serious concerns about any aspect of our work to voice those concerns.

To this effect BASIS has a Whistle Blowing Policy. This procedure is designed to allow concerns of a public interest kind within BASIS to be raised, investigated and where appropriate, acted upon. Complaints may be made by any member of staff, candidates or those contracted to provide services to BASIS.

To view the full Whistle Blowing Policy go to:

<http://basis-reg.co.uk/Portals/1/Resources/Professional-Reg/BASIS%20Whistle-blowing%20Policy.pdf>

### DYSLEXIA POLICY

BASIS Registration Ltd allows students diagnosed with dyslexia to request special examination arrangements. Proof of dyslexia is required a **minimum of 4 weeks** before the exam date so that BASIS can provide special examination arrangements if required.

For a full copy of our Dyslexia Policy please go to:

<http://www.basis-reg.co.uk/Portals/1/Resources/Student%20Resources/TM%2017%20BASIS%20Dyslexia%20Policy%20-%20Sept%202011.pdf?timestamp=1468593429115>

## COMPLAINTS POLICY

For a full copy of our Complaints Policy please go to:

<http://www.basis->

[reg.co.uk/Portals/1/Resources/Secure/Trainer%20Area/TM%2048%20Complaints%20Procedure%20Report%20Form.pdf?timestamp=1534331662892](http://www.basis-reg.co.uk/Portals/1/Resources/Secure/Trainer%20Area/TM%2048%20Complaints%20Procedure%20Report%20Form.pdf?timestamp=1534331662892)

## EXAMINATION GUIDELINES

### INTRODUCTION

Examinations are conducted by BASIS for Training Providers who run training courses for the BASIS Certificate in Crop Protection IPM – Amenity Horticulture in various parts of the UK. The examination is divided into four sections, all of which must be passed. They are:

- a) 2 multi-choice question papers
- b) practical identification test
- c) simulated site exercise
- d) site station and panel vivas

### OVERALL STANDARD FOR EXAMINATION

The examination (and the course training associated with it) has a number of central, core modules, all of which candidates must pass, plus a more specialised module(s) for a skill area that candidates (and their employers) will select prior to starting the course tuition (and at least one month prior to the exam date and notified to BASIS) and for which the pass mark must also be achieved.

The skill area module choices are:

1. Hard surface areas
- or 2. Turf, amenity grass and sports areas
- or 3. Shrubs, borders and container plants
- or 4. Forestry
- or 5. Aquatics
- or 6. Invasive and Injurious Weeds

For a candidate to achieve a BASIS Certificate in Crop Protection IPM - Amenity Horticulture they must pass the core modules and at least one other (skill) module. The skill area selected will be shown on the pass certificate. By prior arrangement and prior booking candidates may sit a second or third skill area exam at a later date. This means candidates can build up their qualifications to include additional skill areas.

Please note candidates will only be tested on the core modules and one skill area on any one exam day. Core module training would be the same for all, followed by separate skill area training.

## THE EXAM

**The exam procedure and structure for the full certificate and for the additional skill exams are covered in this booklet.**

### MULTIPLE CHOICE QUESTION PAPER

Questions for the paper have been submitted by the industry and are validated by a Technical Panel. There will be 2 papers consisting 30 multi choice questions on the core modules and 30 multi choice questions on the pre-selected skill area module, to be completed in 1½ hours.

**Pass mark for this section - 70% in each paper**

### PRACTICAL IDENTIFICATION TEST

Candidates are required to identify common weeds, pests and diseases either in an examination room or a laboratory. All samples in the identification test will be common to arable crops in the UK, and usually local to the area where the examination takes place. Where appropriate, at least 60% should be fresh samples and all should be previously unseen by candidates. The test must include 30 samples consisting of a broad spread between weeds, pests and diseases. Up to 10 samples may be related to application apparatus.

**Pass mark for this section is 85%**

### SIMULATED SITE EXERCISE

Candidates are required to complete an exercise which describes a scenario relevant to the skill module selected and sets questions relevant to the scenario and to that module. It will also incorporate elements of the core modules where appropriate.

**Pass mark for this section - 60%**

### SITE STATIONS AND PANEL VIVA (3 vivas per candidate)

a) & b) Site Station Vivas

All candidates are expected to have practical knowledge of recommendations, application, legislation and storage appropriate to pesticides as outlined in this syllabus. All candidates will be tested by representatives of the industry at the site stations. 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 in this section of the exam: one viva will be with an expert in the skill area module selected and the second will cover application, safety, product registration and storage. Marks from both 'Site Stations' are taken into account when assessing a candidate's ability. Each viva should last for approximately 15 - 20 minutes.

### c) Viva Panel

The final section of the examination involves the 3<sup>rd</sup> viva with candidates meeting a panel of the site station examiners. 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 in amenity horticulture. Where available, the candidate's marks from the previous sections are taken account of by the panel. The interview is carried out in an informal and friendly atmosphere. Time allowed is 15-20 minutes.

#### **Pass mark for this section - 85% in each viva**

NB - Companies are reminded that candidates must have had satisfactory training and supervised field experience before entering for the BASIS Crop Protection Certificate examination. This will usually include at least 18 months on-site / in-field relevant experience. 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 topics applicable to the examination. Examiners must be assured that for the candidate to pass, he/she is capable of giving clear, concise and accurate advice and recommendations.

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

Candidates who do not reach the overall pass mark required but who achieve a pass level in the simulated site exercise and / or the Identification test can carry that pass forward for an exam re-sit and so do not need to re-take that part of the examination.

The core section of the examination cannot be carried forward if the overall result of the candidate is a fail.

Candidates may sit an extra skill area at a pre-arranged exam instance anywhere in the UK provided there are adequate facilities and by agreement with the provider of the exam. This should reduce the need for excessive travel for candidates and allow them to attend a local exam venue.

## Examination Procedure and Structure

The programme for the examination set out below is not “cast in stone” but it is the format that has been used on a number of occasions and it has proved successful.

### Day One

Morning                      May well be used by the tutor as further teaching time or as a refresher / revision period

### L U N C H

Afternoon                      Examination starts

Time Allowed -                      30 multi-choice questions relating to the 7 core modules  
45 minutes

45 minutes                      30 multi-choice questions relating to the selected skill area module

10 minutes                      10 minute break

30 minutes                      Identification test – 30 samples

60 minutes                      The Simulated Site Exercise can be answered either as bullet points or sentences (maximum of 1000 words) and cover skill area, industry related practical issues presented in a job related scenario. Parts of the core modules (eg. Health & Safety) may also be included

**Total**  
**3 hours 10 minutes**

If trainers wish they can set the identification test before the multi-choice but the format above has been found helpful because the candidates have 1 ½ hours written (60 multi-choice) then a break and movement involved in the identification test, then a further 1 hour of written exam with the simulated site exercise, i.e. the identification test gives a break between the two purely written parts of the exam.



## Usually starting at 9am

### Day Two

3 vivas per candidate

#### Viva 1

Site Station Viva – testing aspects of Storage, Health & Safety, Regulation, Application, Best Spraying Practice, Product Approval, Legislation

15 – 20 minutes

#### Viva 2

Site Station Viva – testing aspects relating to the pre-selected skill area (notified at least one month **before** the exam date). The examiner covers practical issues, recommendations, product and method selection, treatment options, operational risks, environmental aspects

15 – 20 minutes

#### Viva 3

Panel Viva with 2 examiners (BASIS Chairman and Industry Skill Area expert) covering any area of the syllabus, relating to the core modules and skill area selected

15 – 20 minutes

The panel will be looking for knowledge and the ability to communicate and give good sound advice. The aim is to help candidates to achieve a pass standard, if, for example, their performance has not been up to the required level in earlier parts of the examination.

The 7 different elements of the examination are collated, marked, verified and results communicated back to the individual candidate (or employer if required), usually in around 20 working days following the date of the exam.

## Examination Procedure to achieve an additional skill area qualification

Prior to taking an examination for a 2<sup>nd</sup> skill area qualification, the candidate will have taken and passed the BASIS Certificate in Crop Protection IPM – Amenity Horticulture Examination. This will have included the 7 core modules and one skill area module.

To achieve a 2<sup>nd</sup> (or 3<sup>rd</sup>) skill area qualification may involve the candidate in additional training, depending on the level of experience and knowledge the candidate already possesses.

Once a candidate has successfully achieved the BASIS Certificate in Crop Protection IPM – Amenity Horticulture, then they may add a further skill area qualification by taking the exam as below. There is no requirement to take the 7 core module elements again if the candidate has kept up to date with their Professional Register Membership. However if candidates have not been keeping up to date on the Professional Register within 3 years of originally qualifying they will be required to re-sit the core element of the exam.

### Second (or third) skill area exam

|               |   |
|---------------|---|
| 45 minutes    | 30 multi-choice questions relating to the skill area selected   |
| 20 minutes    | 20 item identification test relating to the skill area selected. It is suggested that 10 items relate to weeds, pests and diseases (60% of which should be fresh) 5 items relating to application and 5 items relating to environmental and other relevant core module issues |
| 60 minutes    | Simulated Site Exercise covering the skill area selected  |
| 15-20 minutes | Skill area site viva covering a range from all topics relevant to the skill area chosen (see viva 2 above)  |
| 15-20 minutes | Panel viva with 2 BASIS examiners covering topics related to the skill area chosen  |

### Total

**2 hours 35 minutes – 2 hours 45 minutes**

The 4 component parts of the exam will be pulled together, marked, verified and candidates notified within approx. 20 working days after the exam date.

NB. Candidates wishing to sit a second (or third) skill area exam will be asked to do so on a day when a full Amenity FSTS Exam covering their pre-selected skill area is being covered. The exception to this would be if 7 to 12 candidates wish to sit the same pre-selected skill area at the same time (having already gained the Amenity FSTS Certificate in one skill area). In which case an examination session can be organised especially for them.

## YOUR QUESTIONS ANSWERED

### DO I NEED TO TAKE A TRAINING COURSE IN ORDER TO SIT THE BASIS CROP PROTECTION CERTIFICATE EXAMINATION?

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

### WHAT FORM DO THE TRAINING COURSES TAKE?

That will depend on the trainer / training provider, the chosen course and on the candidate's previous experience to date. Courses can run for up to a total of 17 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 obtained on Page 42 - 43.

### HOW DO I APPLY TO TAKE A TRAINING COURSE?

Contact the Training Provider of your choice and complete a training course application form or contact BASIS for advice.

### 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 and agreed with BASIS.

### WHAT DOES THE EXAMINATION ENTAIL?

Details can be found in this booklet on pages 8 - 9.

### 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.

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

If you have not previously been employed by a distributor or contractor selling and/or supplying pesticides or giving advice 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, advice or supply of pesticides must hold the BASIS Crop Protection 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/her 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 or advice documentation. Certainly in the early stages of a person's development and training, they should be within “sight and sound” of the training person, to ensure any advice, recommendations or instructions they give are correct.

### HOW DO I APPLY TO SIT THE BASIS CROP PROTECTION CERTIFICATE EXAMINATION?

Contact the BASIS office or 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 Crop Protection Certificate training course will automatically be entered for the examination and so do not need to apply separately).

It is important that candidates are booked onto the exam as early as possible to allow BASIS to make the necessary exam arrangements. **Re-sit candidates must be notified to BASIS at least 4 weeks prior to the exam; otherwise it may not be possible to make the required arrangements in time.**

### WHEN WILL I RECEIVE MY EXAMINATION RESULTS?

We aim to issue results and feedback within 20 working days of the date of examination. **Please note results will not be given over the telephone.**

## **BASIS CERTIFICATE IN CROP PROTECTION IPM AMENITY HORTICULTURE OBJECTIVE SYLLABUS**

The syllabus has been designed to allow individual modules 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 the time required to cover each section of the syllabus is given in the contents page of this booklet. Those concerned with the delivery of training will thus be able to assess the depth of tuition for each subject and establish their training programme accordingly, taking account of the prior experience and knowledge of the course candidates.

### **CORE MODULES**

#### **MODULE 1 - IMPACT OF AMENITY ACTIVITIES ON BIODIVERSITY, THE ENVIRONMENT AND WATER**

##### **1.1 Competence**

Ensure a knowledge and understanding of the concept and importance of biodiversity, environmental and water considerations which impact on the variety of amenity situations.

##### **1.2 Performance Criteria**

Candidates must be able to:

- Define biodiversity in the context of Amenity Horticulture.
- Understand the importance of biodiversity in the Amenity Environment.
- Describe the role of key organisations involved in developing and promoting biodiversity.
- Demonstrate knowledge of Biodiversity Action Plan (BAP) species related to the Amenity Horticulture sector.
- Identify and describe ways in which conservation measures can assist biodiversity and the environment in Amenity Horticulture situations.
- Describe the impacts of amenity activities which directly or indirectly affect the quality of water.

##### **1.3 Essential Knowledge & Skills**

- Candidates must have the ability to:
- Understand how site factors affect management decisions, with regard to the creation of a biodiversity action plan.
- Define and minimise the effects of pesticides used in Amenity Horticulture.
- Understand and act upon the requirements needed to encourage biodiversity.
- Define and plan activities in any site locality that will improve the biodiversity and the environment of that area.
- Understand how amenity horticulture activities can be organised to avoid water pollution.
- Understand how pesticide use in amenity horticulture should be conducted to avoid water contamination.

## CORE MODULE

### 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 in amenity horticulture and develop 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 causes of weed infestation.
- Describe the main features of seed morphology and physiology that contribute to the dissemination and successful establishment of weed species.
- Understand the dynamics of the weed seed population of soils and especially of the factors that encourage a reduction in seed numbers.
- Understand the importance of vegetative regeneration of weeds in relation to cultivation, planting practices and weed control.
- Interpret the seasonal and locational appearance of major weed species.
- Recognise major weeds according to region.
- Examine and assess weed problems in particular situations and maintain records of infestation.
- Understand the benefits, methods and economics of different control options.
- Select and justify appropriate control measures.
- Recognise which herbicides will reduce weed populations and which combinations of herbicides can be legally and safely applied as tank mixes for specific problems.
- Calculate suitable dose rates and justify the timing and methods of application for specific weed problems.

- Predict the weed control strategies for particular situations which are necessary to reduce weed populations progressively.
- Explain the interaction between site practices, soil type and weed incidence in particular situations.
- Identify and name botanical features used for recognition of seeds, seedlings and mature plants.
- Recognise different stages of plant growth.
- Use an identification key successfully.
- Recognise major weed species associated with particular soil types and amenity areas.
- Describe the nature of weed competition and predict the likely outcomes of particular levels of weed infestation.
- Understand the significance of particular weed and volunteer plant species as hosts of pests and pathogens.
- Recognise poisonous and harmful plants.
- Explain the possible problems caused by particular weed species eg Japanese Knotweed.
- Demonstrate an awareness of legislation relating to noxious weeds and weed seeds.
- Understand the significance of weeds as potential fire, security or surface stability risks.
- Explain the significance of particular site practices to the prevention, reduction and control of weed problems.
- Recognise the competitive abilities of cultivated plants in various locations.
- 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.

## CORE MODULE

### MODULE 3 - RECOGNITION, BIOLOGY AND CONTROL OF PESTS

#### 3.1 Competence

Develop the ability to recognise pests and pest damage, to anticipate and prevent pest problems and to choose safe and appropriate control measures.

#### 3.2 Performance Criteria

Candidates will be able to:

- Develop a knowledge of feeding methods and behaviour which will provide a basis for diagnosis of the causes of pest damage symptoms.
- Develop an awareness of the factors that determine the occurrence of pest damage and its importance.
- Develop a knowledge and understanding of the methods available to prevent or control pest damage.
- Develop the ability to recognise the important pests of specific plants, to identify, anticipate and prevent the damage each may cause, and to select the most appropriate control measures or combination of measures for specific circumstances, taking into account threshold levels for control.
- Develop a knowledge of the characteristics and life cycles of those groups of animals that include important pest species.

#### 3.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Describe the structures used in feeding by eelworms, slugs, mites, insects, birds and rodents.
- Explain the method of feeding of pest species from these groups.
- Relate pest feeding damage to typical symptoms on roots, shoots, leaves, flowers, seeds and fruit.
- Relate pest feeding to the transmission of plant pathogens.
- Diagnose the causes of plant damage by identifying symptoms and/or pests.
- Relate pest incidence to pest mobility, host specificity, weather and climate.
- 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 plant pests.
- Select cultural practices that may be used to minimise pest damage.
- Identify plant varieties resistant to pests and the circumstances in which they should be used.
- Identify biological agents that may be used in commercial practice to control pests and appropriate circumstances for their use.



- Choose appropriate chemical control measures for particular pest problems.
- Explain the advantages of integrating pest control methods by reference to specific examples.
- Recognise eelworms, slugs, millipedes, mites and the important orders of insects.
- Describe typical life cycles of eelworms.
- Describe typical life cycles of mites, millipedes and insects.
- Describe the cycle of generations of aphids.
- Identify the special features of bird and mammal biology that contribute to pest problems caused by these animals.
- Identify the major pests or pest damage symptoms, as appropriate, according to region.
- Evaluate the risk of damage or describe the steps that must be taken to get such risks evaluated by specialist services.
- Recommend and justify specific control measures from the options available, with an understanding of the economic implications of each.
- Evaluate the most appropriate and cost effective control measures, including Integrated Pest Management (IPM) such as cultural, rotational, timing and other options.
- Calculate appropriate dose rates for particular pesticides, and justify the timing and methods of application for specific pest problems.
- Design pest control strategies for specific situations.

## CORE MODULE

### MODULE 4 - RECOGNITION, BIOLOGY AND CONTROL OF DISEASES

#### 4.1 Competence

Develop an ability for the recognition of disease symptoms, the evaluation of disease problems and choice of appropriate control measures.

#### 4.2 Performance Criteria

Candidates will be able to:

- Provide a basis for accurate disease identification.
- Explain the significance of disease-damage and provide a knowledge of the methods of assessment and evaluation.
- Provide an understanding of the biology of major causal agents of disease.
- Demonstrate an understanding of methods available for disease control, reduction and prevention and the role of threshold levels for control.
- Provide knowledge of the major diseases of specific plants and an understanding of the choice and integration of suitable control measures.

#### 4.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Recognise the nature of major types of plant damage.
- Interpret the significance of types (and levels) of damage to plant growth.
- Carry out disease assessments on plants.
- Assess and record disease damage to plants.
- Describe significant characteristics of virus, mycoplasma, bacterial and fungal pathogens and the effects they each have on plants.
- Relate conditions influencing the survival, build-up and dispersal of pathogens to disease development.
- Recognise environmental influences on infection and the development of disease within plants.
- Use a knowledge of the factors influencing infection and disease development to enable forecasting and the prediction of disease risks.
- Develop an understanding of major legislation relating to plant disease.
- Recognise the significance of particular cultural practices to disease control.
- Identify varieties of plants resistant to diseases.
- Understand the various options of physical and chemical control measures and know the economic implications of each.
- Classify the main types of chemical control measures, and major groups of chemicals.

- Justify the choice of methods for the control of particular types of diseases.
- Recognise major diseases in particular plants.
- Evaluate disease risks to particular plants.
- Select and justify appropriate control measures.
- Calculate appropriate dose rates for particular fungicides, and justify the timing and methods of application for specific disease problems.
- Understand and explain disease control strategies.
- Recognise the development of symptoms at different stages of plant growth.
- Recognise major varietal effects, and the influence of growing and storage condition, on symptom expression.
- Interpret the distribution pattern of symptom development.

## CORE MODULE

### MODULE 5 - COMPOSITION, ACTIVITY AND PERSISTENCE OF PESTICIDES

#### 5.1 Competence

Develop an understanding of the nature of pesticides and biological control agents.

#### 5.2 Performance Criteria

Candidates will be able to:

- Ensure the correct use of technical terms.
- Understand the composition of pesticides.
- Develop an awareness of the various control agents, their benefits and drawbacks.
- Explain 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 pesticides by target organisms.
- Understand the implications of pesticide use relative to ground, surface and drinking water.
- Understand the importance of Environmental Information Sheets (EIS).

#### 5.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Explain the use of chemical names, British Standards Institute (BSI) approved common names and proprietary names for pesticides.
- Classify pesticides into functional, chemical and mode of action categories.
- Accurately define terms used in relation to chemicals and plant treatments.
- Identify formulations in the form of emulsifiable concentrates, wettable powders, suspension concentrates, dusts, granules, fumigant materials, combustible materials, seed dressings, aerosols and encapsulated materials.
- 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 doses and the application of particular formulations.
- Describe the characteristics of various biological control agents and understand their benefits and limitations.
- Outline the mode of action of major groups of herbicides, nematocides, molluscicides, acaricides, 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 soil type on the behaviour of pesticide materials.
- Identify types and significant properties of soils.
- Explain the importance of recognising the correct stages of development of plants, weeds, pests and diseases, in relation to plant safety and maximising the effectiveness of treatments.
- Explain the importance of preventing pesticides entering water and the consequences of accidental contamination.
- Recognise the susceptibility of particular varieties of plants to phytotoxic damage by certain materials.
- Explain the limitations of particular materials.
- Explain likely causes of plant damage by chemical treatments.
- 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 pesticides to their possible persistence in the environment, in plant produce and in water.
- Recognise the significance of approved and recommended uses of particular materials in relation to persistence.
- Develop a knowledge of resistance in 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 overcome problems of resistance, and prevent its possible development in target organisms.
- Explain how to perform an environmental risk assessment using the product Environmental Information Sheets (EIS).

## CORE MODULE

### MODULE 6 - APPLICATION OF PESTICIDES

#### 6.1 Competence

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

#### 6.2 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, including calibration.
- Develop an appreciation of potential hazards associated with application and ensure safe practices for the operator, public, environment and water.

#### 6.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Demonstrate a knowledge of the various types of formulations of pesticide 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 (eg granules).
- Give details of types of application treatment.
- Describe vehicles utilised for the application of pesticides.
- Recognise the nature of plant surfaces and their influence on the degree of retention and distribution of chemical treatments.
- Explain the importance of factors such as droplet size, wetters and oil additives to the retention and distribution of chemical treatments on plant surfaces.
- Demonstrate a knowledge of the various types of spray application equipment, including specialised seed treatment, granule and dust applicators and fumigation equipment.
- Demonstrate 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 pumps.
- Identify and describe types of nozzles and where each should be used.
- Describe equipment for ultra-low volume, and controlled-droplet application.
- Understand the interaction of factors such as pressure, nozzle size and type, operator and tractor speed on droplet size and coverage.
- Identify major faults in spraying equipment.
- Describe how to calibrate and maintain tractor spray equipment.

- Describe how to calibrate and maintain hand-operated spraying equipment.
- Describe to how calibrate and maintain granule pesticide applicators.
- Outline procedures for ensuring correct spray output.
- Explain the significance of bout-marking devices, and boom height and stability for accurate spray placement.
- Describe methods of improving the accuracy of spray application.
- Recognise symptoms in plants of incorrect spray application.
- Identify potential hazards in maintaining application equipment and the benefits of the National Sprayer Testing Scheme (NSTS).
- 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 pesticides.
- Recognise safe procedures for protecting the general public, the environment and water from potential hazards during the application of pesticides.
- Understand the qualifications and training required for operators prior to any application.
- Understand the needs and types of continuing training and development required for operators and the benefits of the National Register of Sprayer Operators Scheme (NRoSO).

## CORE MODULE

### MODULE 7 - SAFE USE, HANDLING, TRANSPORT AND STORAGE OF PESTICIDES

#### 7.1 Competence

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

#### 7.2 Performance Criteria

Candidates will be able to:

- Understand the process and requirements of pesticide registration and approval.
- 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.
- Develop an understanding of possible harmful effects of pesticides on plants through direct toxicity, the destruction of pest enemies or the development of pesticide resistance.
- Develop an understanding of the benefits of pesticide use and how they help society.
- Understand the obligations and requirements of pesticide legislation.
- Encourage an awareness of the importance of safe practices and a knowledge of the procedures and precautions that should be adopted.
- Understand and encourage an awareness of the appropriate precautions required to minimise the risks of buying and using illegal pesticides.

#### 7.3 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 crop protection chemicals, 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 (and cumulative) exposure on the toxicity of anti-cholinesterase compounds.
- Recognise the hazards associated with uncontrolled access to 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 plants.



- Define the terms food chain, food web and ecosystem.
- Identify important wildlife refuges in amenity horticulture.
- Explain the possible effects of pesticides on soil animals and micro-organisms.
- Show how pesticides may affect the population density of wild plants, animals and birds.
- Explain how pesticides may cause pollution of water and damage to aquatic organisms.
- Describe the circumstances in which insect pollinators may be killed by pesticides.
- Illustrate, with examples, the toxicity of pesticides to plant species and varieties.
- Explain how plants may be damaged by approved products through incorrect application, dose rates and pesticide mixtures.
- Show how pesticides may come in contact with plants not deliberately treated with them.
- Explain the circumstances in which pesticide use can lead to increased pest incidence.
- Explain the development of resistance to herbicides, insecticides and fungicides.
- 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) Weeds Act 1959
  - h) 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) Plant Protection Products Directive 91/414/EEC
  - d) Plant Protection Products Regulations 2005
  - e) BASIS Registration Limited
  - f) the Local Environment Risk Assessment for Pesticides (LERAP) arrangements
  - g) Plant Protection Products (Basic Conditions) Regulations 1997
- Explain the importance of appropriate choice of chemicals, mixtures, formulations and methods of application in reducing risks to people, the environment and water.
- 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 to avoid water and / or environmental contamination.
- Describe working practices that will minimise contamination of operatives and also 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 interval before allowing access of people and animals to treated areas, and 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 the environment and water.
- Explain the balance of understanding needed to support the benefits of pesticide use; how society gains; how efficiencies are increased; how safety is improved; how parks, playing fields, public areas and amenity sites are enhanced by their use.
- Understand the difference between illegal counterfeit products and parallel imports.
- Describe the potential dangers of using illegal pesticides to the sprayer operator and the environment.
- Recognise the economic and legal implications of buying and using illegal pesticides.

## SKILL AREA MODULE

### MODULE 8 – HARD SURFACE AREAS

#### 8.1 Competence

Develop an understanding of the maintenance of hard surface areas through the control of weeds, pests and diseases, with a knowledge of the economic and environmental implications of each option available.

#### 8.2 Performance Criteria

Candidates will be able to:

- Understand the risks and problems caused by weeds on hard surfaces.
- Understand which weeds are a problem; how they cause problems; how they proliferate and how best to control them. Particular emphasis should be given in tuition to:
  - a) Japanese Knotweed
  - b) Ragwort
  - c) Giant Hogweed
  - d) Brambles, Buddleia etc.
- Develop a knowledge of types of hard surface area and the types of treatment required.
- Develop an understanding of the options for controlling weeds in hard surface areas, with due consideration for safety, efficiency, economics and the environment.

#### 8.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Understand how best practice should be implemented for the different hard surface weed control options, having regard for operators, the public, site workers, wildlife and water safety.
- Explain the high priority to ensure water quality is maintained and understand which weed control practices must be avoided to ensure water is not polluted by weed control activities.
- Describe which pesticide options are permitted for use on hard surface areas; how they work; what doses should be used and where they may be used.
- Explain the importance of timing of the different weed control options and how that affects standards of control.
- Understand the different types of application equipment used for hard surface weed control, with particular regard to types of sprayer, their method of operation and how to calibrate and maintain equipment in good condition.
- Understand the various support schemes available to assist good working practices and how they are implemented e.g. National Sprayer Testing Scheme (NSTS) and the National Register of Sprayer Operators (NRoSO).

- Identify different weed, pest or disease situations on hard surfaces and recommend how best they should be dealt with, having regard for the biology of the problem; the safety of operators and the public; safety to water and the environment, and the economics of control.
- Understand how certain vertebrate pests can be problematic in hard surface areas or nearby, and how they can be controlled eg rabbits, moles and squirrels.
- Understand the implications of actions taken to control weeds (and/or pests) in hard surface areas, with regard to biodiversity and the environment; how best they can be (at least) maintained and where possible enhanced.

## SKILL AREA MODULE

### MODULE 9 – AMENITY GRASS & SPORTS TURF AREAS

#### 9.1 Competence

Develop an understanding of the establishment and maintenance of amenity grass and sports turf areas, with emphasis on the control of weeds, pests and diseases and with knowledge of the economic and environmental implications of each aspect.

#### 9.2 Performance Criteria

Candidates will be able to:

- Understand the risks and problems caused in amenity grass and sports turf areas by:
  - a) weeds
  - b) pests
  - c) diseases
- Understand how amenity grass and sports turf areas are established, cared for and maintained.
- Understand which particular problems require control in each area (amenity grass and sports turf). These include but are not exclusive to:
  - a) Golf courses
  - b) Bowling greens
  - c) Parks
  - d) Garden areas
  - e) Sports pitches
  - f) Grassed areas around industrial sites
  - g) Other amenity grass areas
- Develop an understanding of the options for controlling weeds, pests and diseases, with due consideration for safety, efficiency, economics and the environment.

#### 9.3 Essential Knowledge and Skills

Candidates must have the ability to:

- Explain how best practice should be implemented for the different weed, pest and disease control options, having regard for operators, the public, site workers, wildlife and water safety.
- Describe the high priority given to water quality maintenance and which weed, pest and disease control practices must be avoided to ensure water is not polluted by those activities.
- Understand and explain the most economic and effective methods of amenity grass and sports turf area establishment, whilst recognising best practice standards for the processes involved and the equipment needed.

- Explain which pesticide options are permitted for use on amenity grass and sports turf areas; how they work; what doses should be used, where and when.
- Describe the importance of timing of the different weed, pest and disease control options and how that may affect the standards of control.
- Identify different weed, pest or disease situations in amenity grass and sports turf areas and recommend how best they should be dealt with, having regard for the biology of the problem; the safety of operators and the public; safety to water and the environment, and the economics of control.
- Understand the different types of application equipment used for weed, pest and disease control on amenity grass and sports turf areas; the types of sprayer, their method of working and how to calibrate and maintain equipment in good condition.
- Understand the various support schemes available to assist good working practices and how they are implemented e.g. National Sprayer Testing Scheme (NSTS) and the National Register of Sprayer Operators (NRoSO).
- Understand and explain the implications of actions taken to control weeds, pests and diseases in amenity grass and sports turf areas with regard to biodiversity and the environment. How can they be at least maintained, and where possible enhanced.
- Describe and explain the equipment used and the methods of grass maintenance in different situations e.g. a bowling green versus a golf fairway.

## SKILL AREA MODULE

### MODULE 10 – SHRUBS, BORDERS & CONTAINER PLANTS

#### SECTION A – PLANT GROWTH AND DEVELOPMENT AND PLANT PROPAGATION SYSTEMS

##### A10.1 Competence

Develop an understanding of the factors which contribute to the production of high quality plant material and a knowledge of growing systems relevant to the UK.

##### A10.2 Performance Criteria

Candidates must be able to:

- Demonstrate knowledge of the factors which contribute to the production of high quality plants for the amenity industry.
- Develop an understanding of the production methods for the main plant groups for amenity horticulture.

##### A 10.3 Essential Knowledge & Skills

Candidates must have the ability to:

- Describe and explain the process of plant growth and development.
- Recognise major factors affecting plant growth.
- Assess the factors which contribute to plant quality.
- Describe inputs for maximising yield and quality in amenity plants.
- Recognise the significance of particular plant groups.
- Recognise the main plant groups and their characteristics.
- Understand the significance of soil types and weather problems in the choice of plants used.
- Identify suitable times for sowing and propagating particular plants.
- Understand the different types of cultivation and cultural practices.
- Recognise the main types of cultivation and maintenance equipment.
- Understand the different systems of plant production and management.

## SKILL AREA MODULE

### MODULE 10 – SHRUBS, BORDERS & CONTAINER PLANTS

#### SECTION B – RECOGNITION AND CAUSES OF PLANT DISORDERS

##### **B10.1 Competence**

Develop an ability to discriminate between plant damage directly induced by environmental factors, damage caused by pests and pathogens and possible methods which may be adopted for prevention or control, with due regard for environmental care and production economics.

##### **B10.2 Performance Criteria**

Candidates must be able to:

- Provide a basis for the description and possible identification of damage due to disorders.
- Provide a basis for damage evaluation.
- Outline methods available for preventing and limiting particular plant disorders, and the appropriate selection of corrective treatments, whilst implementing good practice standards of operator and public safety and care for water and the environment.
- Provide a knowledge of the susceptibility of particular plants to certain disorders, and an understanding of procedures suitable for their treatment.

##### **B10.3 Essential Knowledge & Skills**

Candidates must have the ability to:

- Describe symptoms of unsatisfactory growth.
- Recognise plant damage induced by adverse physical soil and/or environmental conditions.
- Recognise plant damage caused by unsuitable pH status, nutrient imbalance, nutrient deficiencies and the misuse of crop protection materials.
- Recognise plant damage caused by adverse soil moisture status.
- Recognise plant damage induced by extreme weather factors.
- Develop an awareness of types of plant damage caused by pollutants from the atmosphere, soil and irrigation water.
- Compare and contrast environmental damage with that which may be caused by pests and pathogens of plants.
- Be aware of the procedures used by specialists which are necessary for the notification and confirmation of possible causes of plant disorders.
- Relate plant growth and development to equivalent stages in unaffected plants.
- Estimate the extent of current and future plant damage.
- Explain the possible causes and cures for particular problems.
- Identify alternative plants and varieties which are less susceptible to particular disorders.
- Identify practices and materials for the rectification of pH and nutrient problems.



- Identify procedures for optimising soil moisture status.
- Identify cultural practices that might alleviate particular disorders.
- Examine a variety of plants for symptoms of damage and poor growth.
- Identify specific instances where damage and poor growth is not attributable to pests and disease, or weed competition.
- Examine particular soils for evidence of compaction, inadequate drainage or moisture stress.
- Interpret the results of laboratory analysis of particular (plant) tissue and soil samples.
- Relate types of topography and plant structure to damage likely from wind, hail, frost and snow.
- Relate specific symptoms to past or present conditions of the physical and chemical nature of soil, use of irrigation water or adverse atmospheric factors.
- Make decisions to correct abnormal plant growth and prevent its recurrence, recognising the need for economic measures and safety to operators, the public / customers, water and the environment.

## SKILL AREA MODULE

### MODULE 11 – FORESTRY

#### SECTION A – TREE GROWTH AND DEVELOPMENT

##### A11.1 Competence

Develop an understanding of the factors which contribute to the development of successful forest areas and a knowledge of British tree species.

##### A11.2 Performance Criteria

Candidates will be able to:

- Understand the issues involved in site selection and site preparation prior to planting young trees.
- Understand the importance and suitability of different tree species selected for any given site including marketing objectives and/or amenity value.
- Understand the key factors involved in propagation, planting, establishment and density of new forest areas.
- Understand the management dynamics of woodland areas including pruning, thinning, harvesting and marketing to achieve targeted outcomes.

##### A11.3 Essential Knowledge and Skills

Candidates must have the ability to:

- Recognise major tree species and understand the geographic limitations of each.
- Identify the major broadleaved and coniferous species used in UK woodlands and forestry.
- Describe and explain the process of plant growth and development including propagation.
- Assess plant quality, health and growth rates and understand the influencing factors.
- Assess the various methods of tree planting and understand the factors involved in choosing the best option in various circumstances and different plant density requirements.
- Recognise and understand the main types of cultivation, arboriculture and harvesting practices.
- Understand the cash flow implications and basic economics of successful woodland development.
- Understand the impact on the environment, biodiversity and water from establishing and developing woodland and forest areas.
- Tree diseases via: [www.forestry.gov.uk/](http://www.forestry.gov.uk/)

## SKILL AREA MODULE

### MODULE 11 – FORESTRY

#### SECTION B – RECOGNITION, CAUSES AND CONTROL OF DISORDERS, PESTS AND DISEASES OF TREES

##### B11.1 Competence

Develop an ability to discriminate between damage to trees that is induced by environmental factors, damage caused by pests and pathogens and methods which may be adopted for prevention or control, with due regard for environmental care.

##### B11.2 Performance Criteria

Candidates will be able to:

- Provide a basis for the description and identification of damage due to disorders.
- Provide a basis for damage evaluation due to a variety of causes.
- Understand the maintenance requirements and practice of the planted area including the control of weeds, pests, diseases, other risks and the economics for successful woodland development.

##### B11.3 Essential Knowledge and Skills

It is essential that candidates have the ability to:

- Identify the major factors (including disorders) which affect the growth of trees.
- Identify the key diseases and insect pests which affect trees, including Dutch Elm, Sudden Oak Death, Rhododendron virus and the various moths which can cause damage to trees and the options for control where applicable.
- Tree Identification: [www.shurdington.org/TreeChart.html](http://www.shurdington.org/TreeChart.html)
- Understand the options for prevention, control and relative importance of the pests and diseases and other risks which affect forestry development.
- Understand the importance and control options of vertebrate pests which affect trees including rabbits, squirrels and deer.
- Identify and understand the various application techniques for pesticides to deliver effective performance with safety to the public, wildlife, and other elements of the environment.

## SKILL AREA MODULE

### MODULE 12 – AQUATICS

#### 12.1 Competence

Develop an understanding of the factors which contribute to the development of successful aquatic areas.

#### 12.2 Performance Criteria

Candidates will 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;
- Demonstrate a knowledge and understanding of methods for weed prevention and control, including an understanding of the choice and integration of suitable and economic control treatments;
- Develop an awareness of the use of biological control agents in aquatic weed control.

#### 12.3 Essential Knowledge and Skills

Candidates must have the ability to:

- Recognise the significance of the particular plant groups and their role in the aquatic environment;
- Understand the significance of the types of water environment and associated substrate types;
- Use an identification key successfully at different stages of plant growth;
- Identify major growth periods for particular aquatic plant groups;
- Recognise major weeds according to location and seasonal appearance;
- Understand the major methods of plant reproduction;
- Understand the causes of weed infestations in aquatic situations;
- Understand the importance of vegetative regeneration of weeds in aquatic situations;
- Understand the harm that can be caused by unwanted weed growth in aquatic situations;
- Predict the weed control strategies which are necessary to progressively reduce weed population;
- Classify the main types of control measures used in the aquatic environment, such as mechanical, environmental, biological and chemical;
- Justify the choice of methods for the control of particular types of weed species;
- Recognise major aquatic species associated with different water types.

## SKILL AREA MODULE

### MODULE 13 – INVASIVE AND INJURIOUS WEEDS

#### 13.1 Competence

Develop an understanding of invasive weeds including: what they are and how they can be identified; the harm that they do; how they develop, spread and reproduce; the options available for control with recognition of differences in levels of control and cost effectiveness; the environmental implications of each control option.

#### 13.2 Performance Criteria

Candidates will be able to:

- Identify individual invasive weed species (native and non-native) at each stage of growth and know the reproduction and spreading mode/s of the weeds and recognise the lookalikes;
- Understand the different impacts of each invasive weed species on buildings, pathways, prepared areas, waterways, grazing lands and pastures, unmanaged areas, development sites and the relationship to the public and the environment;
- Set an individual threshold for each species in individual situation in order to be able to decide on the method/s of prevention and/or control;
- Understand the options for control of invasive weeds by mechanical, structural, chemical and biological means and the merits of each;
- Understand the relative safety issues and cost effectiveness of each control option;
- Understand the environmental impacts of the different control options for invasive weeds;
- Understand, in outline, other (non-weed) invasive species, which affect the UK infrastructure.

#### 13.3 Essential Knowledge and Skills

Candidates must have the ability to:

- Explain how best practice should be implemented for the different control options for invasive weeds having regard for operators, the public, site workers, wildlife and water safety.
- Explain the high priority placed on maintaining water quality and an understanding of the weed control practices which must be avoided to ensure water is not polluted by weed control activities.
- Describe which pesticide options are permitted for invasive weed control: how they work; what doses should be used and where they may or may not be used.
- Explain the implications of cultural controls, earth moving and removal for effective invasive weed control and preventing their spread to other areas.
- Explain the importance of the timing of the different invasive weed control options and how that affects standards of control.

- Understand the different types of application equipment used for invasive weed control, with particular regard to types of sprayer, injection equipment, their methods of operation, including calibration and maintenance of the equipment in good condition.
- Understand the various authorities involved with invasive weed control e.g. Environment Agency (EA) and Natural England (NE) and how their roles can affect control options.
- Understand the various support schemes available to assist good working practices and how they are implemented e.g. National Sprayer Testing Scheme (NSTS); National Amenity Sprayer Operator Register (NASOR) and BASIS Amenity Register (BAR).
- Know the rules and requirements for correct disposal of each individual invasive species and the infested waste.
- Explain how to evaluate the type and severity of invasive weed control problems and be able to perform the re-evaluation and long term monitoring of the problem.
- Explain what actions should produce an effective solution, having prior regard for the safety of the public and spray operators; biological and environmental issues; water quality and the economics of control measures.
- Understand how pre-planning, landscaping and other elements related to the control of invasive weeds can be incorporated into control plans and recommendations so as to minimise any impact on biodiversity and to seek its enhancement where possible.
- Understand how, at all times, there should be an integrated approach to any measures taken so as to protect environmental interests and biodiversity.

## SAMPLE MULTI-CHOICE QUESTIONS FOR THE AMENITY HORTICULTURE 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 60 (30 + 30) questions and covers all the areas listed in the attached syllabus.

1. In which of the following soils will water retention be lowest?
  - a) loamy sands
  - b) silty soils
  - c) peaty soils
  - d) clay loams
  
2. What is the correct procedure to adopt when spraying upwind of a residential area?
  - a) reduce the pressure
  - b) use hollow cone jets
  - c) spray cross wind
  - d) leave part of the area unsprayed
  
3. From which two points is boom height measured?
  - a) boom to ground
  - b) nozzle tip to ground
  - c) boom to target
  - d) nozzle tip to target
  
4. Work place exposure limits (WEL) are referenced to exposure by
  - a) skin contact
  - b) ingestion
  - c) sensitisation
  - d) inhalation
  
5. Which one of the following formulations is most likely to reduce the handling hazards of toxic pesticide?
  - a) an emulsifiable concentrate
  - b) a granule
  - c) a dust
  - d) a suspension concentrate

6. A hydraulic nozzle functions by
- a) forcing liquid under pressure through a small orifice on the nozzle
  - b) high pressure oil pushing the liquid out of a nozzle
  - c) injecting the liquid into an air-stream
  - d) allowing gravity to push liquid from a nozzle
7. Which one of the fungi below often requires two hosts (alternate) to complete its life cycle?
- a) mildews
  - b) rusts
  - c) botrytis
  - d) honey fungus
8. Plants are grouped in a botanical family because they
- a) have similar coloured flowers
  - b) have similar floral structure
  - c) grow in similar soil conditions
  - d) have similar leaf morphology
9. A contact insecticide is commonly used on several separate occasions when whitefly control is being attempted because
- a) adults need several doses to kill them
  - b) eggs and immature stages are difficult to kill
  - c) this will avoid resistance appearing
  - d) the level of insecticide has to be gradually built up in the plant
10. In a crop of chrysanthemums in April, small buff to white blisters appear on the undersides of the leaves. What should you suspect?
- a) grey mould
  - b) ray blight
  - c) powdery mildew
  - d) white rust



## BASIS CERTIFICATE IN CROP PROTECTION IPM AMENITY HORTICULTURE

Must read (have):

- Code of practice for using plant protection products, DEFRA  
<http://www.hse.gov.uk/pesticides/topics/using-pesticides/codes-of-practice/code-of-practice-for-using-plant-protection-products.htm>
- The Encyclopaedia of Arable Weeds, HGCA Contact HGCA at [hgca@cambertown.com](mailto:hgca@cambertown.com) or free phone 0845 245 0009
- The UK Pesticide Guide (annually), BCPC <http://www.bcpc.org/product/uk-pesticide-guide-2017> 01420 593200
- Yellow Code – Code of Practice for suppliers of pesticides to agriculture, horticulture and forestry

Useful to read (have):

- Product manuals from manufacturers of crop protection products
- Protecting our Water, Soil and Air, DEFRA

Useful websites

- [www.basis-reg.co.uk](http://www.basis-reg.co.uk)
- [www.pesticides.gov.uk](http://www.pesticides.gov.uk)
- [www.voluntaryinitiative.org.uk](http://www.voluntaryinitiative.org.uk)

## BASIS APPROVED TRAINERS

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

### **Chelmsford & West Essex Training Group**

2 Salisbury Cottages  
Maldon Road  
Hatfield Peverel  
CHELMSFORD  
Essex, CM3 2HS

Contact: Debbie Wedge  
Tel: 01245 381193  
email: [debbiewedge@aol.com](mailto:debbiewedge@aol.com)  
Trainer: Debbie Wedge  
Web: [www.cwetg.catrain.co.uk](http://www.cwetg.catrain.co.uk)

**Modules: Amenity Horticulture/ Hard Surfaces/  
Shrubs & Borders/ Turf/ Forestry & Invasive  
and Injurious Weeds**

### **James Christian-Ilett**

8 Painshall Close  
Welton  
LINCOLN  
Lincolnshire  
LN2 3NU

Contact: James Christian-Ilett  
Tel: 01673 860925  
email: [christian.ilett@btinternet.com](mailto:christian.ilett@btinternet.com)  
Trainer: James Christian-Ilett

**Modules: Amenity Horticulture/  
Hard Surfaces/ Shrubs & Borders & Turf**

### **Landbased Training**

Garth Cottage  
Wintringham  
MALTON  
North Yorkshire  
YO17 8HX

Contact: Linda Bower  
Tel: 01944 758379  
email: [linda@landbased-training.com](mailto:linda@landbased-training.com)  
Trainer: Debbie Wedge  
Web: [www.landbased-training.com](http://www.landbased-training.com)

**Modules: Invasive & Injurious Weeds**

### **STRI**

St Ives Estate  
BINGLEY  
West Yorkshire  
BD16 1AU

Contact: Ruth Mann  
Tel: 01274 565131  
email: [ruth.mann@stri.co.uk](mailto:ruth.mann@stri.co.uk)  
Trainer: Ruth Mann  
Web: [www.stri.co.uk](http://www.stri.co.uk)

**Modules: Hard Surfaces/ Turf/ Aquatics &  
Invasive & Injurious Weeds**

### **The Vale Training Group**

Marsh Hill Farm  
Marsh  
AYLESBURY  
Buckinghamshire  
HP17 8ST

Contact: Kate Mason  
Tel: 01296 612201  
email: [kate.mason@valetraining.co.uk](mailto:kate.mason@valetraining.co.uk)  
Trainer: Debbie Wedge  
Web: [www.valetrainingservices.co.uk](http://www.valetrainingservices.co.uk)  
**Modules: Turf & Invasive & Injurious Weeds**

**The following Colleges, Trainers and Training Organisations have expressed an interest in running some, or all, of the training modules and / or the Amenity Horticulture examination.**

**DJL Agronomics**  
Highgrove House  
Cassbrook Drive  
Fulstow  
LOUTH,  
LN11 0XR

Contact: Dr Jim Lewis  
Tel: 07831 120363  
email: [djlagronomics@gmail.com](mailto:djlagronomics@gmail.com)  
Trainer: Dr Jim Lewis  
Web: [www.djlag.co.uk](http://www.djlag.co.uk)  
**Modules: Amenity Horticulture**

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