

CITY & GUILDS NPTC LEVEL 2 AWARD IN THE PRINCIPLES OF SAFE HANDLING AND APPLICATION OF PESTICIDES (PA1) WORKBOOK



This workbook provides underpinning knowledge for candidates wishing to take the foundation qualification required for operation of all types of application equipment:



Boom sprayers

- mounted
- trailed; or
- self - propelled

Variable geometry boom
sprayers

Air assisted broadcast
sprayers

Slug pellet/granular
applicators

Boat mounted applicators

Hand-held sprayer/
applicators to land/water,
Hand-held granular
applicators to land/water

Injection equipment

Minimal calibration
equipment

Application of hot and cold
mists/fogs

Application of smokes

Batch dipping

Seed treatment

Application during a process

Subsurface application

Specialist application
equipment

INTRODUCTION

The City & Guilds NPTC Level 2 Award in the Principles of Safe Handling and Application of Pesticides (QCF) (PA1) 0216-10 has replaced The City & Guilds Level 2 Award in the Safe Use of Pesticides (QCF) (PA1) 0216 Foundation Unit PA1.

Assessment

This qualification is assessed by computer -based multiple choice questioning via an e-volve online assessment.

Candidates are required to complete all the test questions.

Candidates may not refer to any literature during the assessment.

Each PA1 e-volve test will have 33 multiple choice questions. To be declared 'competent', a candidate will need to get a minimum of 24 correct answers which must include a minimum of one question correctly answered in each of the seven sections of the test; each section covers a specific learning outcome.

This workbook has been produced to support candidates wishing to undertake the qualification. It has been written to provide the essential information, together with an opportunity for prospective candidates to test themselves in readiness for assessment. The workbook consists of two sections:

Section 1 – The principles of safe handling and application of pesticides

Section 2 – The principles of safe handling and application of pesticides - test yourself

For simplicity, the topics covered within each section of the workbook will only relate directly to the learning outcomes and the assessment criteria of the qualification. You will be directed to additional sources of information should you require them.

A learning outcome is – what the candidate should know, understand or be able to do.

Assessment criteria are – how learning outcomes are measured (tested).



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THE PRINCIPLES OF SAFE HANDLING AND APPLICATION OF PESTICIDES

OUTCOME 1. KNOW THE LEGISLATIVE REQUIREMENTS AND CODES OF PRACTICE RELATING TO THE USE OF PESTICIDES

Legislation is referred to throughout the current Code of Practice (COP) for Using Plant Protection Products. Codes of practice are written guidelines issued by an official body or a professional association to help compliance with standards.

The Code of Practice for Using Plant Protection Products (for England and Wales) can be found at: <http://www.pesticides.gov.uk>

There is a separate Code of Practice for Scotland, details can be found at: <http://www.scotland.gov.uk>

There is a separate Code of Practice for Northern Ireland, details can be found at: www.dardni.gov.uk/ppp-code.

There is an annex in each COP containing a specific list of laws for reference.

Assessment criterion 1.1 Identify an operator's responsibility under current legislation relating to the use of pesticides

What you need to know!

You may need to answer a question relating to an operator's responsibility under any current piece of legislation. **The ones in green have particular relevance to pesticides**

Legislation (law) impacts on all aspects of work including the use of pesticides; failure to comply with legislation may result in prosecution, fines or even imprisonment.

The following pieces of legislation may apply: (Please note that this is not an exhaustive list)

- **The Health & Safety at Work Act (1974)** – there are specified duties under the act as an employer, employee or self-employed person

- **The Management of Health and Safety at Work Regulations (1999)** – a risk assessment must be carried for all activities
- **Control of Substances Hazardous to Health Regulations (2002)** – a COSHH assessment must be carried out and complied with
- **The Control of Pesticide Regulations (1986)** – only certified operators may use professional products. Users of pesticides must take all reasonable precautions to protect the health of human beings, creatures, plants, safeguard the environment and in particular avoid pollution of water
- **Personal Protective Equipment Regulations (1992)** – PPE must be supplied, and worn
- **Manual Handling Operations Regulations (1992)** – not to manually handle if it is avoidable, and use safe lifting techniques when manual handling is required
- **Provision and Use of Work Equipment Regulations (1998)** – requires that regular checks are made to machinery and equipment
- **Wildlife and Countryside Act (1981)** – operations must be carried out at times to minimise the impact on wildlife

What you need to know!

You may need to answer a question relating to an operator's responsibility under The Plant Protection Products (Sustainable Use) Regulations (2012)

The ones in green are of particular significance

The Plant Protection Products (Sustainable Use) Regulations (2012), which encompass the following:

- users of pesticides need to take reasonable precautions to protect human health and the environment when storing, handling, using and disposing of pesticides
- keep up to date with pesticide related legislation
- **use only currently authorised and legal pesticides, be aware of illegal or counterfeit products, buy only from reputable sources, check that the product delivered matches the product ordered**
- **anyone purchasing a professional product must ensure that the end user holds a Certificate of Competence for application**
- a person using a pesticide must receive adequate training for the task and hold a training certificate or Certificate of Competence unless working under direct supervision
- **consider using alternative methods to pesticide application e.g. Integrated Pest Management or Integrated Weed Management**
- **preference should be given to products not classified as dangerous for the aquatic environment nor containing priority hazardous substances when the use of the product represents a risk to water quality**

- the amount of pesticide used and frequency is as low as reasonably practicable on: roads, railway lines, very permeable surfaces and sealed surfaces where there is a greater risk of run off or contamination of surface and groundwater; areas used by the general public or vulnerable groups; areas in the close vicinity of healthcare facilities; protected areas identified under the Water Framework Directive; and areas recently treated by pesticides which will be accessible to agricultural workers
- equipment must be inspected in line with current legislative requirements*
- application must be confined to the intended target

*Equipment inspection

This is a summary of the requirements:

It applies to the following **types** of sprayer:

- mounted on trains or aircraft
- boom sprayers over 3 metres in length
- those mounted on sowing equipment
- variable geometry boom sprayers
- vehicle mounted or drawn sprayers

Anyone who own or leases a sprayer that was:

- purchased on or before the 26th November 2011 must have it inspected before the 26th November 2016
- purchased after the 26th November 2011 and is less than five years old must have it inspected before its fifth anniversary

Up to 26th November 2020 equipment must be inspected every five years; after 26th November 2020 equipment must be inspected every three years.

Note: it does not apply to:

- any type of hand-held equipment
- knapsack sprayers

Professional users must conduct regular calibrations and technical checks.

Any person who owns or leases plant protection equipment must ensure that it is not used unless it has passed inspection.

Overleaf are details of the National Sprayer Testing Scheme (NSTS)



SUSTAINABLE USE DIRECTIVE – REQUIREMENTS FOR SPRAYER TESTING

The SUD states that all sprayers over 3 metre boom width will need to be tested by 26th November 2016. All boom sprayers include air-blast and those mounted on aircraft and trains.

Why does my sprayer need testing?

To comply with the SUD the majority of active sprayers will require testing by 26th November 2016. An annual NSTS test is also a requirement of the major crop assurance schemes and many supermarket protocols.

How do I get my sprayer tested?

Visit the NSTS website www.nsts.org.uk. Choose your nearest or preferred test centre and make a booking for a mutually convenient date.

Where is the test conducted?

Testing can be done on your own premises or any convenient location.

What if there are any faults?

The NSTS examiner will be able to supply the necessary spares and repairs to remedy most faults on the spot.

What will the test cost?

The test is commercial at the point of use, the cost will depend on the complexity of the machine and the distance travelled. The Machine examiner will set a commercial rate which will include the cost of NSTS registration. All NSTS examiners hold a Level 3 City & Guilds NPTC Certificate of Competence in Sprayer Examining qualification.

Who administers NSTS?

The day to day management is carried out by a manager and administrator based in Peterborough. NSTS has a Board of Management which comprises members of application technology, contracting, farming unions, crop assurance and environmental and Government organisations.

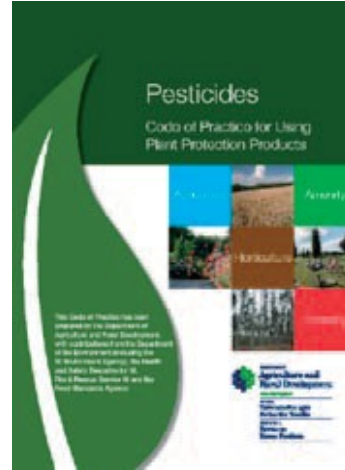
Benefits of having sprayers tested include:

- Satisfies crop assurance and supermarket protocols
- Reduces costly downtime
- Confirms accurate application
- Easily conducted on farm
- Can increase secondhand sprayer values
- Affirms commitment to the Voluntary Initiative

Assessment criterion 1.2 Identify an operator's responsibilities under current codes of practice relating to the use of pesticides

What you need to know!

You may need to answer a question relating to responsibilities under current codes of practice



Responsibilities under Codes of Practice will include the following:

- following the current Code of Practice for the safe use of pesticides
- carrying out and complying with an Environmental Assessment of the application site
- ensuring that equipment is in good condition
- correctly calibrating the application equipment
- using pesticides in a safe manner

OUTCOME 2. UNDERSTAND THE RELEVANCE OF PESTICIDE PRODUCT INFORMATION

Full details relating to the product label are provided in the relevant section of the Code of Practice for Using Plant Protection Products. Please read the relevant sections for further information.

Assessment criterion 2.1 Explain the relevance of product label information

What you need to know!

You may need to answer a question relating to the relevance of product information

All pesticide products have essential information printed on the product label. It is vitally important to read this information before using a pesticide.

(Further detailed information can be found on the Material Safety Data Sheet (MSDS)).



Label information may include any of the following:

- statutory information – must be strictly complied with
- hazards associated with the product – e.g. flammable
- environmental precautions – e.g. aquatic toxicity
- PPE requirements – e.g. gloves, face shield, respirator, boots
- active substance(s) – may be needed in the event of an emergency
- approved field of use – the industry sector for which the product is approved
- maximum dose rate – this must not be exceeded
- timing of application(s) – manufacturer's recommendations must always be followed
- current authorisation number – provides evidence of authorisation
- approved adjuvants (wetting agents or 'stickers') – only approved adjuvants can be used as recommended

OUTCOME 3. UNDERSTAND HOW TO MINIMISE THE RISK OF HUMAN CONTAMINATION AND IMPLEMENT EMERGENCY PROCEDURES

Full details relating to preventing people from being exposed to pesticides are provided in the relevant section of the Code of Practice for Using Plant Protection Products. Please read the relevant sections for further information.

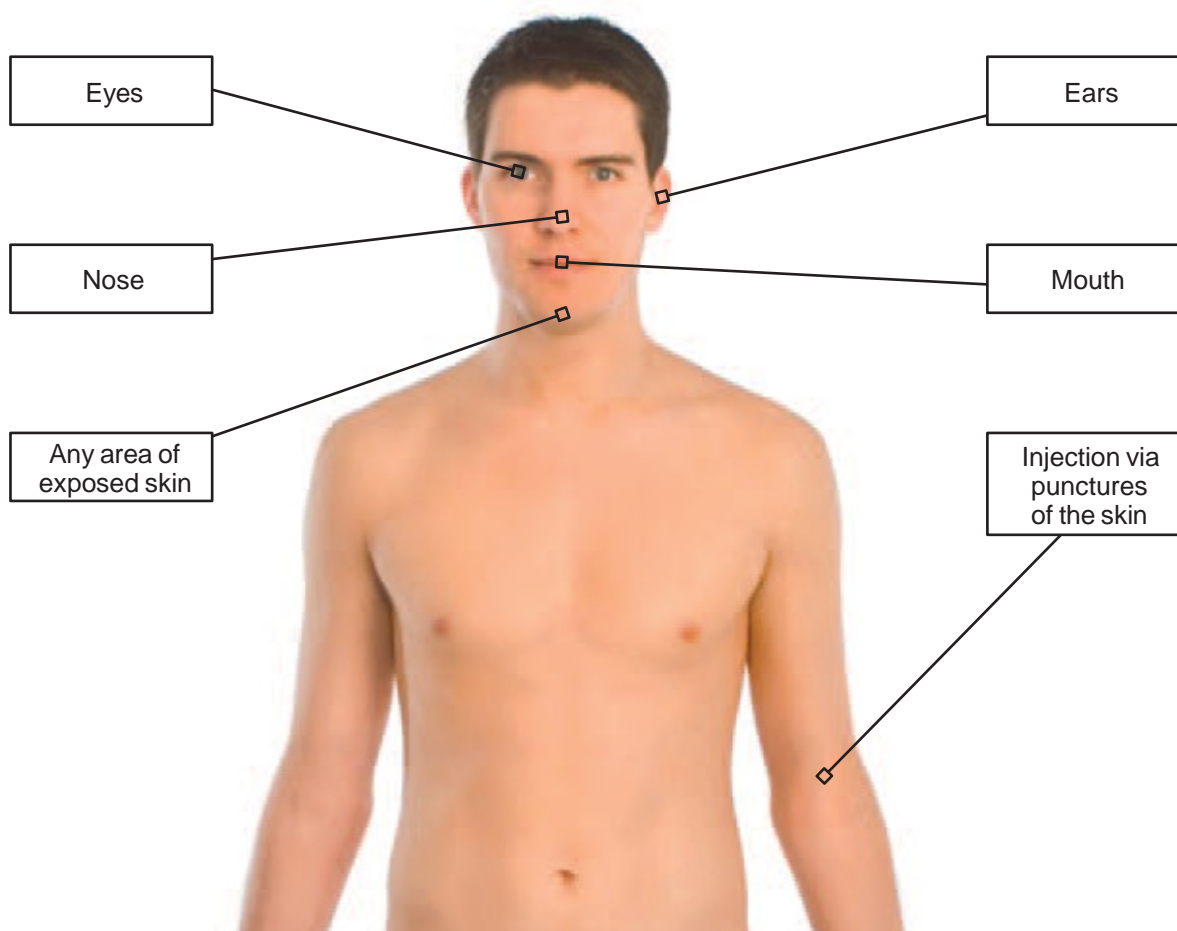
Assessment criterion 3.1 Identify possible routes of pesticide contamination

What you need to know!

You may need to answer a question relating to possible routes of contamination

Possible routes of pesticide contamination may include:

- through the eye(s) , especially from splashes
- inhalation (breathing in pesticide) particularly in confined spaces
- ingestion (through the mouth)
- absorption through the skin (any exposed part)
- injection (if any part of the skin is pierced by something contaminated with pesticide)



Assessment criterion 3.2 Identify appropriate Personal Protective Equipment (PPE) for pesticide application

What you need to know!

You may need to answer a question relating to items of PPE required for a specified pesticide operations; type, condition and features.

It is important that you are able to identify the correct PPE required for the operation you intend to carry out. It includes knowing about the quality standard marks e.g. CE Mark and the type, condition and features of the PPE to ensure it is suitable.

The law requires employers to provide PPE, and employees to wear it; however it is important to understand why certain items of PPE need to be worn and how they provide protection to the operator, or have other benefits.



The **CE marking** as it is legally called since 1993 (per directive 93/68/EEC) is a mandatory conformity mark for products placed on the market in the European Economic Area (EEA).

European law requires that PPE has to comply with legislation. The CE marking is not a quality mark, but PPE with the CE marking on it conforms to the essential requirements of the applicable EC directives.

Only PPE that conforms and is specified on the product label should be supplied and worn.

Specific types of PPE that have certain features will be required for certain pesticide operations; These will be specified on the product label. It goes without saying that all PPE should be in good condition (fit for purpose) and within date (if appropriate).

PPE routinely includes the following types of equipment:

- gloves
- coveralls
- face shields
- footwear
- respirators



Examples of correctly worn PPE



Picture 1. For liquids



Picture 2. For particulates, gas/vapours (*see notes below)

*To help ensure you are protected, all respirators provided for use at work must be CE marked to show that the design has been tested to a recognised standard.

Additional markings indicate the standard (e.g. EN 149: 2001) and the protection level that you can get if the respirator is a good fit and you use it correctly.

Respirators can be fitted with different filters. Filters are classified in relation to the form of the hazardous substance(s) they can be used against – either particles, gas/vapour, multi-gas or combined (particle and gas/vapour). They are APF (Assigned Protection Factor) numbered: the higher the number, the better the protection.

The product information will clearly indicate the type of filter required

Further information can be found in the HSE publication: **Respiratory protective equipment at work – a practical guide**. It provides guidance on the selection and use of adequate and suitable respiratory protective equipment (RPE) in the workplace, in order to comply with the law. It can be found at <http://www.hse.gov.uk>

Assessment criterion 3.3 Identify the symptoms of pesticide contamination

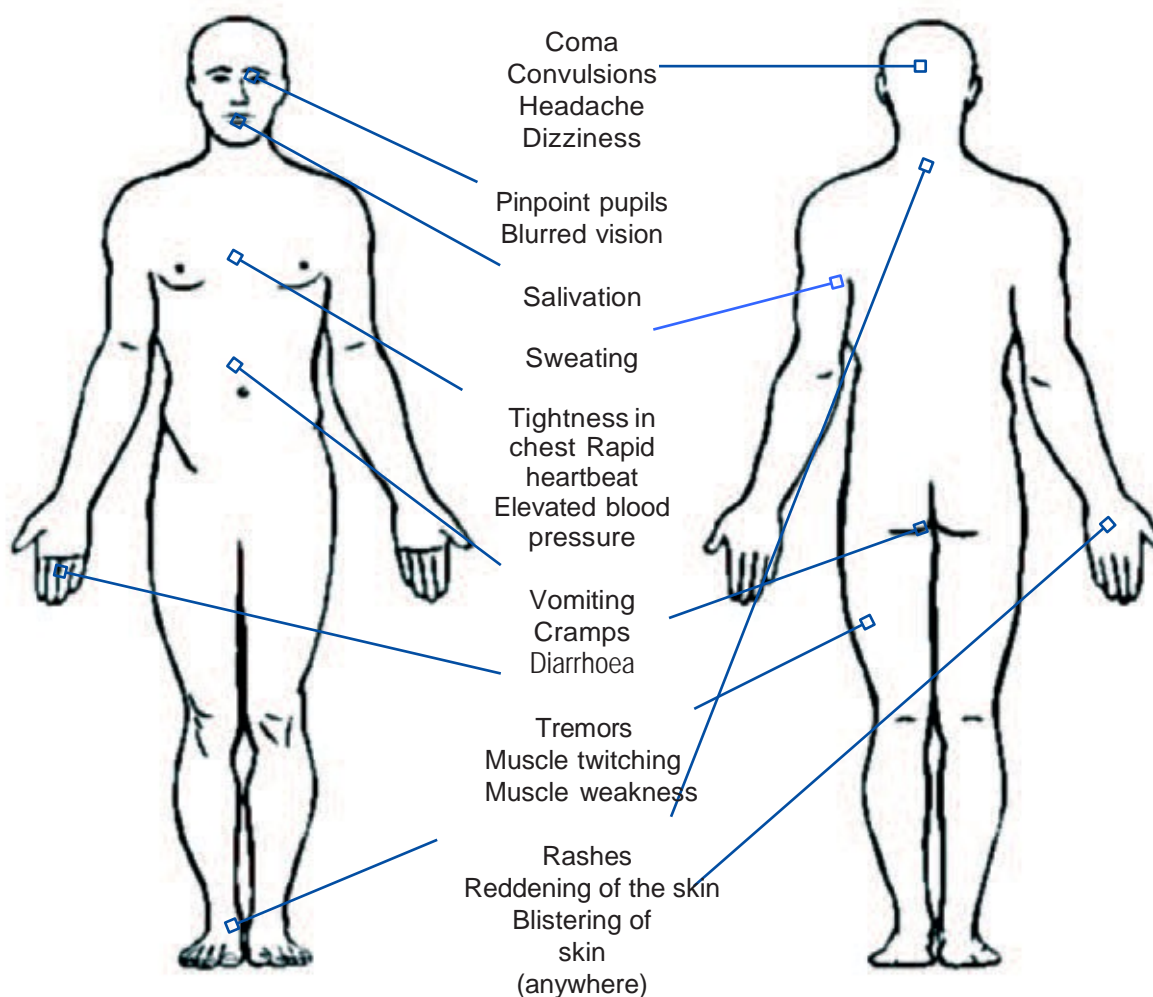
What you need to know!

You may need to answer a question relating to the symptoms of pesticide contamination

The common symptoms of pesticide contamination include:

- headache
- nausea
- stomach pains
- rashes/blistering of skin

Detailed symptoms of pesticide poisoning



Assessment criterion 3.4 Explain appropriate procedures for dealing with pesticide contamination

What you need to know!

You may need to answer a question relating to how to deal with contamination of yourself and a third party

Appropriate procedures for dealing with pesticide contamination include:

- **self** – rapidly identify contamination, and decontaminate, remove contaminated PPE and clothing, seek medical advice
- **third parties** – protect yourself, relocate to safe area, decontaminate if possible, remove contaminated PPE and clothing, contact emergency services
- **information access** – a product label and the Material Safety Data sheet (MSDS) must be made available to the emergency services

OUTCOME 4. KNOW HOW TO STORE AND TRANSPORT PESTICIDES SAFELY

Full details relating to the safe storage and transportation of pesticides are provided in the relevant sections of the Code of Practice for Using Plant Protection Products. Please read the relevant sections for further information.

Assessment criterion 4.1 State how pesticides should be stored

What you need to know!

You may need to answer a question relating to ways in which pesticides should be stored

Safe storage includes the following aspects:

- storing in the original container, with the product label
- maintaining stock security to avoid theft and misuse
- careful handling to reduce chances of spillage
- adequate containment facilities in the event of spillage
- product segregation to avoid dangerous occurrences e.g. explosion, fire, vapour release



Assessment criterion 4.2 State how pesticides should be transported

What you need to know!

You may need to answer a question relating to ways in which pesticides should be transported

The transportation requirements include:

- mobile storage is secure and meets current Codes of Practice
- careful handling to reduce chances of spillage
- adequate containment facilities
- returning unused concentrated pesticide to the store (usually within 24 hours)
- maintaining stock security to avoid theft and misuse

OUTCOME 5. KNOW HOW TO MANAGE AND DISPOSE OF SURPLUS PESTICIDE AND WASTE MATERIALS

Full details relating to managing and disposing of surplus pesticide and waste materials are provided in the relevant sections of the Code of Practice for Using Plant Protection Products. Please read the relevant sections for further information.

Assessment criterion 5.1 Identify appropriate methods of reducing waste from pesticide application

What you need to know!

You may need to answer a question relating to how to reduce waste from pesticide application

Methods of reducing waste from pesticide application may include:

- accuracy of calibration calculations
(so only the correct amount for the operation is mixed)
- accurate calibration of sprayer/applicator
- correct mixing of pesticides



Assessment criterion 5.2 State how to manage and dispose of surplus concentrate and dilute pesticides

What you need to know!

You may need to answer a question relating to the ways to manage and dispose of surplus concentrate and dilute pesticides

For concentrated pesticide it may include:

- collection by a licensed waste disposal contractor
- returning to supplier if a currently approved product

For dilute pesticide it may include:

- back on to the site/target as long as it is below the maximum dose rate
- treated by a specialist treatment facility on site (e.g. a lined Bio-bed)

Assessment criterion 5.3 State how to manage and dispose of waste materials arising from pesticide operations

What you need to know!

You may need to answer a question relating to ways in which to manage and dispose of waste materials arising from pesticide operations

Managing and disposing of waste appropriately may include:

- dealing appropriately with empty packaging – using a licensed waste disposal contractor
- triple rinsing containers manually
- container disposal by a licensed waste disposal contractor
- secure storage until disposal
- returning to the supplier
- collection by a licensed waste disposal contractor if the product is out of approval or suspect in any other way

OUTCOME 6. KNOW THE RECORD KEEPING REQUIREMENTS ASSOCIATED WITH PESTICIDE OPERATIONS

Full details relating to record keeping are provided in the relevant section of the Code of Practice for Using Plant Protection Products. Please read the relevant section for further information.

Assessment criterion 6.1 Identify the records required to comply with legislation and best practice in respect to pesticide operations

What you need to know!

You may need to answer a question relating to the records required to comply with current legislation and best practice

For full compliance, records may include all of the following:

- training records
- Environmental Assessment records
- COSHH assessment records
- control measure records
- duplicate stock records (storage records)
- pesticide treatment records
- records monitoring exposure/health surveillance records
- waste transfer notes (disposal records)

(Which will also meet farm assurance and cross compliance requirements)



OUTCOME 7. UNDERSTAND HOW TO MINIMISE THE RISK OF ENVIRONMENTAL CONTAMINATION AND IMPLEMENT EMERGENCY PROCEDURES

Full details relating to protecting wildlife and the environment are provided in the relevant section of the Code of Practice for Using Plant Protection Products. Please read the relevant section for further information.

Assessment criterion 7.1 Identify the risks to the environment from pesticides

What you need to know!

You may need to answer a question relating to risks to the environment from pesticides

Risks to the environment may include:

- pollution of water and the aquatic environment
- pollution of specially designated areas
- pollution or destruction of wildlife habitats
- off target application/contamination

One of the major focuses under the Water Framework Directive is the protection of water sources and the enforcement of Water Protection Zones (WPZ's). It is important that users of pesticides are aware of how pesticides can reach water sources.

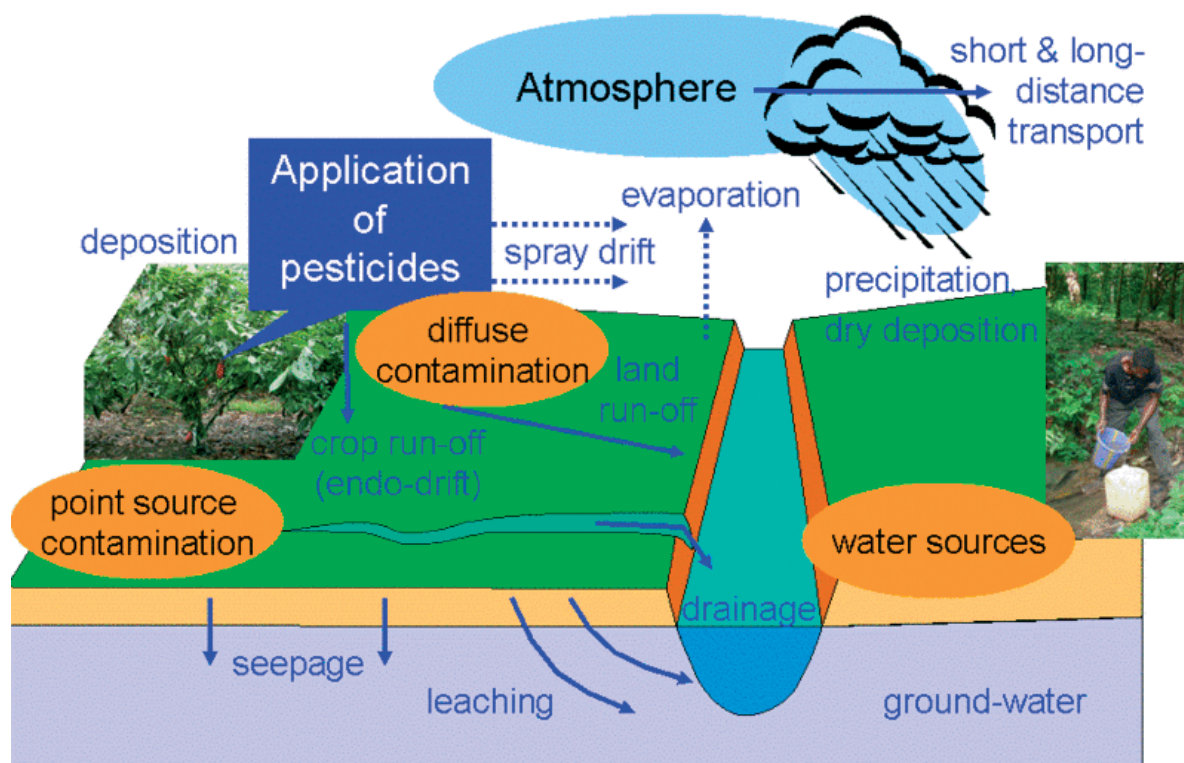
How pesticides can reach water sources:

There are four major routes by which pesticides can reach water sources; they may:

- drift outside of the intended spray area
- percolate, or leach, through the soil
- be carried to the water as runoff
- be spilled, for example accidentally or through neglect

They can also be carried to water by soil erosion, even though the application site is some distance from a body of water

The weather, soil type, presence of a growing crop, the method used to apply the chemical, and the nature of the pesticide are all important factors.



Assessment criterion 7.2 Describe how to carry out pesticide application to minimise the risk to the environment

What you need to know!

You may need to answer a question relating to the ways in which to carry out pesticide application to minimise the risk to the environment

Minimising risks to the environment may include:

- reasonable precautions taken to protect the environment
- application confined to the intended target
- application carried out at the appropriate time of day
- implementing appropriate measures for the protection of human health and the environment
- applying pesticides only in suitable weather conditions
- informing neighbours/other interested parties so that appropriate measures can be taken
- protection of the public accessing rights of way



Assessment criterion 7.3 Explain appropriate procedures for dealing with environmental contamination from pesticides

What you need to know!

You may need to answer a question relating to how to deal with **one** spillage **and** a suspected case of animal poisoning

Procedures for dealing with environmental contamination may include dealing with:

- minor spillages – containment, collection and disposal
- major spillages – contain if possible, inform appropriate environmental agency and the emergency services
- suspected animal poisoning – phone Wildlife Incident Investigation Scheme (WIIS)



TEST YOURSELF

The following section of this workbook has been designed so that you can test your knowledge in preparation for your e-volve online assessment. The sample questions are realistic and reflect the multiple choice questions that you are likely to encounter when you undertake your assessment.

Test yourself – Assessment criterion 1.1

Question 1. When using a pesticide on very permeable surfaces, the operator should always ensure that

- ☐ (a) the amount of pesticide used is as low as reasonably practical
- ☐ (b) they have been supplied with the calibration sheet
- ☐ (c) the pesticide being used is not classified as corrosive
- ☐ (d) they have permission from the local authority.

Test yourself – Assessment criterion 1.2

Question 2. Before any item of pesticide application equipment is used, it should be

- ☐ (a) new and approved by the supplier
- ☐ (b) in good condition and calibrated
- ☐ (c) fitted with new filters
- ☐ (d) registered with DEFRA.

Test yourself – Assessment criterion 2.1

Question 3. If a pesticide product has been granted a 'Extension of Authorisation for Minor Uses' (EAMU), it means it can be used on

- ☐ (a) a specific crop/target that is not on the label
- ☐ (b) any crop that looks similar to those on the label
- ☐ (c) only those crops growing in the same land
- ☐ any crop as long as the registration fee is paid.

Test yourself – Assessment criterion 3.1

Question 4. Splashes of pesticide product onto an operator's exposed skin could lead to contamination by

- ☐ (a) absorption
- ☐ (b) inhalation
- ☐ (c) ingestion
- ☐ (d) injection.

Test yourself – Assessment criterion 3.2

Question 5. One advantage of heavier duty 'Type 4' coveralls is that they can be

- ☐ (a) cleaned and re-used
- ☐ (b) used for any application
- ☐ (c) kept in a tractor tool box
- ☐ (d) used with solvent substances.

Test yourself – Assessment criterion 3.3

Question 6. Which of the following is a typical symptom of personal pesticide contamination?

- ☐ (a) Vertigo.
- ☐ (b) Backache.
- ☐ (c) Earache.
- ☐ (d) Nausea.

Test yourself – Assessment criterion 3.4

Question 7. If a small quantity of liquid pesticide comes into contact with the skin during application, what procedure should be carried out?

- ☐ (a) Absorb the contaminant with a cloth.
- ☐ (b) Wash the contaminant off with water.
- ☐ (c) Use absorbent paper to remove the contaminant.
- ☐ (d) If there are no ill effects, continue with the application.

Test yourself – Assessment criterion 4.1

Question 8. In a shelved pesticide store, powdered pesticide products should be stored

- ☐ (a) next to liquid products
- ☐ (b) above liquid products
- ☐ (c) below liquid products
- ☐ (d) in a separate cabinet.

Test yourself – Assessment criterion 4.2

Question 9. What would be the safest way of transporting a concentrated pesticide container to an application site some distance away from the main store?

- ☐ (a) Securely fastened and wedged inside a tractor cab.
- ☐ (b) In a secure leak proof box, fixed in the back of a pick up truck.
- ☐ (c) In a tough plastic bag, securely locked in the boot of a car.
- ☐ (d) Laid on a bed of straw in a wheelbarrow.

Test yourself – Assessment criterion 5.1

Question 10. Correct calibration of the pesticide applicator will ensure that

- ☐ (a) the guarantee on the applicator will not be invalidated
- ☐ (b) all operators wear the correct PPE when filling it
- ☐ (c) operators receive a Certificate of Competence
- ☐ (d) the correct rate of product is applied.

Test yourself – Assessment criterion 5.2

Question 11. Providing the maximum dose rate is not exceeded, surplus dilute pesticide product can be

- ☐ (a) tipped down a drain and flushed with water
- ☐ (b) stored in an old container and used later
- ☐ (c) collected by licensed waste disposal contractor
- ☐ (d) applied to the application site providing that the maximum dose rate is not exceeded.

Test yourself – Assessment criterion 5.3

Question 12. An approved method for disposal of triple rinsed plastic pesticide containers is to be

- ☐ (a) burned at low temperatures
- ☐ (b) used as workshop storage containers
- ☐ (c) collected by licensed waste disposal contractor
- ☐ (d) buried on waste ground.

Test yourself – Assessment criterion 6.1

Question 13. A COSHH assessment record should be kept

- ☐ (a) for five years
- ☐ (b) until revised
- ☐ (c) until inspected
- ☐ (d) for forty years.

Test yourself – Assessment criterion 7.1

Question 14. When applying pesticide products, beneficial insects can be protected by

- ☐ (a) applying at maximum dose
- ☐ (b) following the Countryside Code
- ☐ (c) applying in hot weather conditions
- ☐ (d) applying in cool weather conditions.

The Answers

In order to stand a chance of passing the e-volve online assessment you need to get at least 11 correct answers from 14 offered in this test. Remember that some answers will come from the current Code of Practice (COP) for Using Plant Protection Products, which you need to have read in conjunction with this workbook.

The correct answers are:

1 (a), 2 (b), 3 (a), 4 (a), 5 (a), 6 (d), 7 (b), 8 (b), 9 (b), 10 (d), 11 (d), 12 (c), 13 (b), 14 (d)

Notes

[illegible]

Notes

[illegible]



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Safe handling and application of pesticides