



# **City & Guilds NPTC Level 2 Award in the Safe Application of Pesticides Using Boat Mounted Equipment (PA5) (601/5144/4)**

**Version 1.0 (February 2024)**

**Qualification Handbook**

## Qualification at a glance

<b>Subject area</b>	Pesticides
<b>City &amp; Guilds number</b>	0216
<b>Age group approved</b>	16+
<b>Entry requirements</b>	Candidate must meet minimum age requirements, Completion of unit 049
<b>Assessment</b>	To gain this qualification, candidates must successfully achieve the following assessments: <ul style="list-style-type: none"> <li>• One to one practical assessment with oral questioning by an NPTC City &amp; Guilds approved assessor</li> </ul>
<b>Grading</b>	Met/Not Met
<b>Approvals</b>	Full Centre approval required
<b>Support materials</b>	Qualification Handbook (candidates). Assessment materials (approved assessment Centers only).
<b>Registration and certification</b>	Consult the Walled Garden/Online Catalogue for last Registration and Certification dates.

Title and level	City & Guilds qualification number	Regulatory reference number	GLH	TQT
City & Guilds Level 2 Award in the Safe Application of Pesticides Using Boat Mounted Equipment	0216-53	601/5144/44	54	60

Version and date	Change detail	Section
1.0 February 2024	Initial version	All

# Contents

<b>Qualification at a glance</b>	<b>2</b>
<b>Contents</b>	<b>4</b>
<b>1 Introduction</b>	<b>5</b>
<b>Pre-requisite – 0216-49 City &amp; Guilds Level 2 Principles of Safe Handling and Application of Pesticides</b>	<b>5</b>
<b>Structure</b>	<b>7</b>
<b>Total Qualification Time (TQT)</b>	<b>7</b>
<b>2 Centre requirements</b>	<b>9</b>
<b>Approval</b>	<b>9</b>
<b>Appeals and Equal opportunities</b>	<b>11</b>
<b>Quality Assurance</b>	<b>11</b>
<b>Learner entry requirements</b>	<b>11</b>
<b>Age restrictions</b>	<b>11</b>
<b>Access arrangements and reasonable adjustments</b>	<b>11</b>
<b>3 Delivering the qualification</b>	<b>12</b>
<b>Initial assessment and induction</b>	<b>12</b>
<b>Support materials</b>	<b>12</b>
<b>4 Assessment</b>	<b>13</b>
<b>Assessment of the qualification</b>	<b>14</b>
<b>Assessment strategy</b>	<b>14</b>
<b>Time constraints</b>	<b>14</b>
<b>5 Units</b>	<b>15</b>
<b>Structure of the units</b>	<b>15</b>
<b>Guidance for delivery of the units</b>	<b>15</b>
<b>Unit 141 Operating boat mounted sprayers fitted with hydraulic nozzles/rotary atomisers for applying pesticides to water (PA5A)</b>	<b>16</b>
<b>Unit 142 Operating boat mounted granular applicators for applying pesticides to water</b>	<b>26</b>
<b>Unit 143 Operating boat mounted applicators for applying pesticides to water (PA5P)</b>	<b>36</b>
<b>Appendix 1 Sources of general information</b>	<b>47</b>

# 1 Introduction

This document tells you what you need to do to deliver the City & Guilds Level 2 Award in the Safe Application of Pesticides Using Boat Mounted Equipment:

Area	Description
Who is the qualification for?	<p>This is an Independently Assessed qualification (PA5)</p> <p>Type of Learner: If your job involves applying pesticides in a commercial role then you are legally required by the Plant Protection Products (Sustainable Use) Regulations (2012) to take this qualification.</p> <p>Qualification Overview: This qualification is designed specifically for those who wish to apply pesticides from a boat as part of their daily role. The award will supersede the old 0216 (pa5) unit.</p> <p>What you need to do: Candidates to undertake an oral and practical assessment</p>
What does the qualification cover?	<p>This qualification covers the requirements for the safe application of pesticides using Boat Mounted Equipment</p> <p>Please refer to the Qualification Handbook for more detail.</p>
What opportunities for progression are there?	<p>Pre-requisite – 0216-49 City &amp; Guilds Level 2 Principles of Safe Handling and Application of Pesticides</p> <p>Recommended progression onto 0216-63 – City &amp; Guilds Level 3 Award in Responsible Pesticide Management.</p> <p>Once a candidate has successfully completed this qualification, they are able to legally apply pesticides using the methods and equipment identified within this qualification.</p>

Area	Description
Who did we develop the qualification with?	Developed with the Health and Safety Executive, Chemical Regulation Division, Voluntary Initiative and practicing industry stakeholders, DEFRA, Environment Agency.

Is it part of an apprenticeship framework or initiative?	No
--	----

---

## Assessment Guidance for the Candidate

A list of registered Assessment Centres is available from City & Guilds NPTC.  
([www.nptc.org.uk](http://www.nptc.org.uk))

Assessment is a process by which it is confirmed that the candidate is competent in the unit(s) within the award to which the assessment relates. It is the process of collecting evidence about the candidates capabilities and judging whether that evidence is sufficient to attribute competence.

The Candidate must be registered through the City & Guilds approved Assessment Centre for this qualification prior to the assessment.

## Structure

To achieve the City & Guilds Level 2 Award in the Safe Application of Pesticides Using Boat Mounted Equipment (0216-53) learners must achieve:

City & Guilds unit number	Unit title	GLH
---------------------------	------------	-----

### Pre-Requisite unit from 2016-49:

Learners must have achieved **this** mandatory unit prior:

101	Principles of safe handling and application of pesticides (PA1)	26
-----	---	----

### Optional units:

Learners must achieve **one** of the following **three** units from the optional units.

141	Operating boat mounted sprayers fitted with hydraulic nozzles/rotary atomisers for applying pesticides to water (PA5A)	28
142	Operating boat mounted granular applicators for applying pesticides to water (PA5B)	28
143	Operating Boat Mounted Applicators for Applying Pesticides to Water (PA5P)	28

## Total Qualification Time (TQT)

Total Qualification Time (TQT) is the number of notional hours which represents an estimate of the total amount of time that could reasonably be expected for a learner to demonstrate the achievement of the level of attainment necessary for the award of a qualification.

TQT comprises of the following two elements:

- 1) the number of hours that an awarding organisation has assigned to a qualification for guided learning
- 2) an estimate of the number of hours a learner will reasonably be likely to spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by – but, unlike guided learning, not under the immediate guidance or supervision of – a lecturer, supervisor, tutor or other appropriate provider of education or training.

Title and level	GLH	TQT
City & Guilds NPTC Level 2 Award in the Safe Application of Pesticides Using Boat Mounted Equipment (PA5) (0216-53)	54	60

---



## 2 Centre requirements

### Approval

#### Full approval

To offer this qualification, new centres will need to gain both centre and qualification approval. Please refer to the document **Centre Approval process: Quality Standards** for further information. Please email **qasupport@cityandguilds.com** for further information on the approval process.

#### Centre staffing

Staff delivering these qualifications must be able to demonstrate that they meet the following requirements:

- be technically competent in the areas in which they are delivering
- be able to deliver across the breadth and depth of the content of the qualification being taught
- have recent relevant teaching and assessment experience in the specific area they will be teaching, or be working towards this
- demonstrate continuing CPD.

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before delivering a course programme.

### Physical resources

Centres must be able to demonstrate that they have access to the equipment and technical resources required to deliver this qualification and its assessments.

## **Assessment Guidance for the Assessor**

Staff assessing these qualifications must be approved Certificate of Competence City & Guilds NPTC Assessors and must be independent and cannot have been involved with the training of the Candidate. This qualification can only be assessed by an Assessor who is suitably qualified and meets the requirements of the awarding body.

Certificate of Competence City & Guilds NPTC Assessors must meet the following requirements:

- show competence and provide evidence of industry expertise in the qualification/s they wish to assess
- hold the qualification as a candidate and have been technically evaluated as an Assessor
- be up to date with their verification and relevant first aid
- demonstrate continuing technically relevant CPD Compliance with these requirements is a pre-requisite for Assessors remaining on the list of approved Assessors.

Verification is a process of monitoring assessment; it is an essential check to confirm that the assessment procedures are being carried out in the way City & Guilds has laid down. The overall aim of verification is to establish a system of quality assurance that is acceptable in terms of both credibility and cost effectiveness and approved Assessors will be subject to a regular visit by the Verifier at a time when assessments are being undertaken.

A selection of assessment reports completed by the Assessor will be evaluated by a City & Guilds approved Quality Consultant.

## **Safe Practice**

Appropriate PPE must be worn at all times All equipment must be operated in such a way that the Candidate, Assessor, other persons, animals or other equipment are not endangered.

If these conditions are not observed this will result in the Candidate not meeting the required standard.

## **Validation of Equipment**

Any item(s) equipment used for the assessment must comply with current legal requirements.

Additional information may be sought from the relevant manufacturer's instruction book, operators' manual, product label/database or any other Government/Government Agency publication.

## Appeals and Equal opportunities

Centres must have their own auditable, appeals procedures. If a Candidate is not satisfied with the examination conditions or a Candidate feels the opportunity for examination is being denied, the Centre Manager should, in the first instance, address the problem. If, however the problem cannot be resolved, City & Guilds will arbitrate and a Principal Verifier may be approached to offer independent advice.

All appeals must be clearly documented by the Centre Manager and made available to the Principal Verifier or City & Guilds if advice is required.

Should occasions arise when Centres are not satisfied with any aspect of the verification process, they should contact the Quality Assurance Manager at City & Guilds NPTC, 5-6 Giltspur Street, London, EC1A 9DE.

Access to the qualification is open to all, irrespective of gender, race, creed or special needs. Subject to H&S restrictions the Centre Manager should ensure that no learner is subjected to unfair discrimination on any grounds in relation to access to assessment and to the fairness of the assessment. QCA requires City & Guilds to monitor centres to check whether equal opportunities policies are being adhered to.

## Quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications. Quality assurance includes initial centre approval, qualification approval and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and City & Guilds is responsible for external quality assurance. All external quality assurance processes reflect the minimum requirements for verified and moderated assessments, as detailed in the Centre Assessment Standards Scrutiny (CASS), section H2 of Ofqual's General Conditions. For more information on both CASS and City and Guilds Quality Assurance processes visit: the [What is CASS?](#) and [Quality Assurance Standards](#) documents on the City & Guilds website.

## Learner entry requirements

As part of the assessment for this qualification, learners must have achieved PA1 0216-49 Principles of Safe Handling and Application of Pesticides prior to completing this qualification.

## Age restrictions

This qualification is approved for learners aged 16 or above.

## Access arrangements and reasonable adjustments

Access arrangements are adjustments that allow candidates with disabilities, special educational needs, and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

The Equality Act 2010 requires City & Guilds to make reasonable adjustments where a

disabled person would be at a substantial disadvantage in undertaking an assessment.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the JCQ access arrangements and reasonable adjustments and Access arrangements - when and how applications need to be made to City & Guilds for more information. Both are available on the City & Guilds website:

<http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments>

### 3 Delivering the qualification

#### Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs
- support and guidance they may need when working towards their qualification.
- any units they have already completed or credit they have accumulated which is relevant to the qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualification, their responsibilities as a learner and the responsibilities of the centre. This information can be recorded on a learning contract.

#### Support materials

The following resources are available for this qualification:

Description	How to access
Candidate Handbook	<a href="http://www.nptc.org.uk">www.nptc.org.uk</a>
Assessment Pack (available only to assessors)	<a href="http://www.nptc.org.uk">www.nptc.org.uk</a>

## 4 Assessment

### Assessment of the qualification

Candidates must:

- have a completed practical observation with oral questioning for each optional unit.

Assessment types			
Unit	Title	Assessment method	Where to obtain assessment materials
141	Operating boat mounted sprayers fitted with hydraulic nozzles/rotary atomisers for applying pesticides to water	Practical observations with oral questioning.  Centres may use the materials provided by City & Guilds.	<a href="http://www.nptc.org.uk">www.nptc.org.uk</a>
142	Operating boat mounted granular applicators for applying pesticides to water	Practical observations with oral questioning.  Centres may use the materials provided by City & Guilds.	<a href="http://www.nptc.org.uk">www.nptc.org.uk</a>
143	Operating boat mounted applicators for applying pesticides to water	Practical observations with oral questioning.  Centres may use the materials provided by City & Guilds.	<a href="http://www.nptc.org.uk">www.nptc.org.uk</a>

## Assessment strategy

City & Guilds has written the practical observations with oral questioning for each optional unit to use with this qualification, live assessment materials can be downloaded by the assessor via the Assessment Pack from the NPTC website.

## Time constraints

The following must be applied to the assessment of this qualification:

Candidates must finish their assessment within 24 months of date of initial registration.

Assessments should take no longer than 1.5 – 3 hours.

Qualification registration is valid for two years.

<b>Summary of responsibilities in the assessment process</b>		
Centre responsibilities	Candidate responsibilities	Assessor responsibilities
A suitable site is made available for the assessment to take place		Ensuring that the site provided is suitable for the assessment to take place
Machinery, equipment and materials are available to enable assessment of all the activities to take place	To be familiar with the machinery/equipment being used for the assessment	Ensuring that the machinery, equipment and materials provided satisfy the assessment requirements
	To bring appropriate Personal Protective Equipment (PPE) to the assessment	Ensuring that candidate's PPE complies with the requirements of the assessment
	To bring relevant training materials (including calibration sheet if applicable)	
	To bring a product label appropriate for the assessment	To ensure that the product label is appropriate for the assessment (or provide a suitable alternative)

## 5 Units

### Structure of the units

These units each have the following:

- City & Guilds reference number
- title
- level
- guided learning hours (GLH)
- unit aim
- assessment type
- learning outcomes, which are comprised of a number of assessment criteria

### Guidance for delivery of the units

This qualification comprises a number of **units**. A unit describes what is expected of a competent person in particular aspects of their job.

Each **unit** is divided into **learning outcomes** which describe in further detail the skills and knowledge that a candidate should possess.

Each **learning outcome** has a set of **assessment criteria** (performance and knowledge and understanding) which specify the desired criteria that must be satisfied before an individual can be said to have performed to the agreed standard.



## Unit 141

# Operating boat mounted sprayers fitted with hydraulic nozzles/rotary atomisers for applying pesticides to water

<b>Level:</b>	2
<b>GLH:</b>	28
<b>Assessment type:</b>	Practical Observation with Oral Questioning
<b>Aim:</b>	The aim of this unit is for the candidate to safely apply pesticides using Boat Mounted Sprayers Fitted With Hydraulic Nozzles/Rotary Atomisers for Applying Pesticides to Water

### Learning outcome

The learner will:

LO1 Know the legislative and safety regulations relating to application equipment **(Criteria 1.1 – 1.2)**

### Assessment criteria

The learner can:

AC1.1 Describe the legal requirements relating to applying pesticides using boat mounted sprayers

AC1.2 Describe how to apply pesticides safely using boat mounted sprayers following industry best practice

### Topic 1.1

The term on or near water may include the following:

- any areas, which include drainage channels, streams, rivers, ponds, lakes, reservoirs, canals and dry ditches and the banks or areas immediately adjacent

Operating legal requirements:

- all required guards are in place and equipment complies with legal requirements
- comply with The Plant Protection Products (Sustainable Use) Regulations 2012
- the operator must hold the appropriate certification for the equipment they are using

Both required:

- ensure the pesticide has aquatic approval
- seek environmental agency approval

## Topic 1.2

May include:

- extra person present at all times
- comply with relevant codes of practice
- availability of life ring/rescue devices
- personal flotation device
- be aware of any safety implications imposed by COSHH/Risk Assessment and comply with the requirements

Factors which may affect the speed of the boat:

- wind speed
- water flow
- weed obstruction

## Learning outcome

The learner will:

LO2 Be able to assess the environmental factors relating to mixing and application (**Criteria 2.1 – 2.2**)

## Assessment criteria

The learner can:

AC2.1 Identify risks to the aquatic environment

AC2.2 Explain how to minimise risks to the environment

## Topic 2.1

May include:

- wildlife
- non-target plants
- hedgerows
- housing
- public access
- sensitive crops/areas
- water courses
- boreholes
- livestock drinking points
- recreational use
- water extraction points
- de-oxygenation of water
- removal of fish cover
- removal of bank side wildlife habitat
- removal of bank side vegetation leading to bank erosion
- other risks specific to the site

## Topic 2.2

May include:

- work in an upstream direction (if applicable)
- treat the permitted area only
- check weather suitability before treatment
- check downstream uses before treatment
- inform neighbours/downstream users before application
- use an appropriate pesticide (minimal environmental impact)
- careful timing of treatment
- check and maintain application rate
- avoid spray drift
- exclude livestock
- erect warning signs

Check and comment on wind speed:

- use of anemometer or visible signs at suitable height
- wind direction

Reasons for minimising spray drift:

- avoidance of contamination to people and the environment, including the aquatic environment

Factors that affect spray drift

- nozzle type
- nozzle size
- pressure
- boat forward speed
- direction of spraying
- boom/nozzle height
- defective equipment

## Learning outcome

The learner will:

LO3 Be able to read and interpret product information (**Criteria 3.1 – 3.2**)

## Assessment criteria

The learner can:

AC3.1 Read product information

AC3.2 Interpret product information

## Topic 3.1 - Topic 3.2

May include the following:

- product name
- active substance(s) (ingredient(s))

Important information:

- field of use (aquatic)
- target
- maximum individual dose
- maximum total dose
- maximum number of treatments
- Specific product precautions/warnings
- operator protection
- environmental protection
- restrictions on use

Crop specific information:

- target
- dose rate
- water volume
- timing

Mixing and spraying:

- filling
- reduced volume applications (if applicable)
- recommended nozzles
- recommended pressure
- spray quality
- additional label information

---

## Learning outcome

The learner will:

LO4 Be able to prepare and calibrate the applicator **(Criteria 4.1 – 4.5)**

## Assessment criteria

The learner can:

AC4.1 Identify sprayer components and controls

AC4.2 Carry out pre use checks to the boat

AC4.3 Carry out pre-use and operational checks to the sprayer

AC4.4 Calibrate the sprayer and record relevant data

AC4.5 Calculate the quantities of pesticide and water required for a specified area

## Topic 4.1

May include:

- tank
- filters
- pump
- pressure gauge
- pulsation damper

- filling control and devices
- agitation control
- pressure or volume regulator/pressure relief valve
- on/off control
- boom isolators
- tank wash system
- valve positions
- boom pressure compensation
- other items specific to the applicator

Nozzle types:

- flat fan – general purpose
- air inclusion – reduces drift

## Topic 4.2

May include:

- suitable for the situation
- accessibility of boat controls
- accessibility of sprayer controls
- even loading
- outboard motor
- applicator power source
- presence of personal flotation device
- no equipment on operator's back when operating from the boat

## Topic 4.3

Security of attachment:

- fasteners tight
- straps inspected and adjusted if necessary

Possible mechanical defects:

- seized, worn or damaged controls/components
- atomiser drives/electrical connectors

Applicator lubrication:

- identification of lubrication points
- visual inspection of lubrication points
- visual inspection of levels

Boom settings, suspension and break-back devices:

- boom suspension operational
- break-back efficiency
- height adjustment

Remove, clean and refit a filter:

- remove and clean using appropriate method
- contain spillage
- check for defects, replace if damaged

- refit

Remove, clean/replace and refit a nozzle/restrictor:

- remove and clean using appropriate method
- contain spillage
- check for defects replace if worn/damaged
- refit

Use of control panel may include:

- functions of control panel
- recognition of malfunctions before and during operation
- check accuracy of base settings
- switch to manual/test mode where applicable

Part fill applicator:

- suitable site selected
- safe, secure mooring when transferring pesticides
- fill by usual on-site method, following approved procedures
- clean water supply

Check for leaks and correct spray patterns:

- use higher than normal operating pressure
- visual check of all nozzles/atomisers for correct spray patterns, absence of blockages, streaking, pulsing
- correct alignment
- replace defective nozzles/atomisers/discs
- lids and seals
- pipe work and connections
- control valves
- filters
- pressure gauge
- diaphragm check valves

Action in event of control panel failing:

- stop pesticide application
- manual operation of controls if possible

#### **Topic 4.4**

Select and record boat forward speed:

- direction of travel (upstream or downstream)
- suitable boat forward speed for target
- appropriate engine speed established
- accurate measurement of distance
- accurate measurement of time taken to cover distance
- correct use of formula to establish forward speed

Calculate required output:

- correct use of formula

Select appropriate nozzle/atomiser:

- use of manufacturers operators handbook
- use of nozzle/atomiser manufacturers literature

- confirm requirements of product label

Operating pressure/disc speed:

- pressure as determined by nozzle chart
- disc speed as determined by manufacturers literature
- pressurise/purge appropriate to the system

Nozzle/atomiser outputs:

- use a measuring jug check to check output from at least one nozzle/atomiser per boom section (minimum of three per applicator)
- compare with target output
- vary pressure to make small adjustments
- change nozzles/atomisers if required
- Or any other acceptable method

Calibration data:

- boat identification
- boat engine speed
- sprayer engine speed
- boat forward speed
- application volume
- nozzle/restrictor/disc fitted
- pressure/disc speed
- flow rate

## Topic 4.5

To include:

- amount of water required for specified area
- amount of pesticide required for specified area
- amount of pesticide required for full tank

---

## Learning outcome

The learner will:

LO5 Be able to operate the application equipment **(Criteria 5.1 – 5.4)**

## Assessment criteria

The learner can:

AC5.1 Measure the required quantities and add to the applicator

AC5.2 Demonstrate safe and accurate application procedures

AC5.3 Carry out all activities protecting human health and the environment

AC5.4 Complete a treatment record

## Topic 5.1

To include:

- safe, secure mooring when transferring pesticides and equipment

- correct selection and use of PPE (as required by the product label and/or COSHH/Risk Assessment)
- suitable site selected
- fill by usual on-site method, following approved procedures
- clean water supply
- accurate measurement of water
- accurate measurement of pesticide
- correct filling procedure
- use of filling device if fitted
- avoidance of spillage
- observance of pesticide manufacturers instructions for mixing and agitation

## Topic 5.2

Methods to achieve accurate application

Marking out the site to include:

- marker poles
- blob markers
- buoys
- GPS

Procedure to refill applicator part way through application:

- mark the spot at which the applicator emptied
- refill applicator
- continue spraying by accurately matching at the appropriate point

Procedure when a nozzle/restrictor becomes blocked during an application

- mark the spot
- select and use appropriate PPE
- clean or replace nozzle/restrictor as appropriate

Demonstrate safe and accurate application procedures to include:

- ensure boom is level or aligned to the target
- correct boom/nozzle height according to target operate controls to start and finish applying accurately at the beginning and end of each bout
- correct forward speed and pressure for site conditions
- accurate matching of bouts/use of marking aids
- coping with obstacles
- all of specified area treated, minimising overlaps and misses
- awareness of changes in wind speed and direction

## Topic 5.3

To include:

- prevention of personal injury and contamination through correct selection and use of PPE (as required by the product information, COSHH/Risk Assessment)
- prevention of public/bystander contamination
- safe filling procedure
- avoidance of spray drift



- avoidance of off target application/contamination
- avoidance of over dosing/under dosing target/plant material
- minimising the impact on the aquatic environment

#### **Topic 5.4**

Completion of the treatment record must be:

- accurate
- legible (if handwritten)

---

### **Learning outcome**

The learner will:

LO6 Know how to carry out post-operational procedures (**Criteria 6.1 – 6.3**)

### **Assessment criteria**

The learner can:

AC6.1 Explain how to manage surplus pesticide and waste material

AC6.2 Explain how to clean and decontaminate the sprayer and the boat

AC6.3 Describe the storage requirements for the sprayer

#### **Topic 6.1**

Surplus concentrate pesticide:

- return to temporary mobile store
- return to fixed store

Containers:

- triple rinsed
- placed in secure storage until disposal
- returned to supplier
- collected by licensed waste contractor

Packaging:

- thoroughly emptied
- placed in secure storage until disposal
- collected by a licensed waste disposal contractor

Surplus dilute pesticide:

- back on to site as long as it is below the maximum dose rate
- use on another approved target
- treated by specialist treatment facility on site (e.g. a lined bio bed)
- collected by a licensed waste disposal contractor

## **Topic 6.2**

May include:

- select and use appropriate PPE
- appropriate site
- thorough washing with water and suitable cleaning agent (if recommended/required)
- internal and external surfaces
- use of in-built wash systems if provided
- care to ensure contamination 'hot-spots' are clean
- thorough flushing of systems
- appropriate bio-security measures implemented
- safe disposal of contaminated washings
- when cleaning, ensure covers when under repair
- safe procedures followed

## **Topic 6.3**

May include:

- ensure the applicator is clean and dry
- inspect for wear and damage
- replace any worn or damaged parts
- controls left in appropriate positions
- frost protection measures implemented
- lubricate as required
- store undercover and out of direct sunlight
- store in a secure area

## Unit 142

# Operating boat mounted granular applicators for applying pesticides to water

<b>Level:</b>	2
<b>GLH:</b>	28
<b>Assessment type:</b>	Practical Observation with Oral Questioning
<b>Aim:</b>	The aim of this unit is for the candidate to safely operate boat mounted granular applicators for applying pesticides to water

---

### Learning outcome

The learner will:

LO1 Know the legislative and safety regulations relating to application equipment (**Criteria 1.1 – 1.2**)

### Assessment criteria

The learner can:

AC1.1 Describe the legal requirements relating to applying pesticides using boat mounted granular applicators

AC1.2 Describe how to apply pesticides safely using boat mounted granular applicators following industry best practice

### Topic 1.1

The term on or near water may include the following:

- any areas, which include drainage channels, streams, rivers, ponds, lakes, reservoirs, canals and dry ditches and the banks or areas immediately adjacent

Operating legal requirements:

- all required guards are in place and equipment complies with legal requirements
- comply with The Plant Protection Products (Sustainable Use) Regulations 2012
- the operator must hold the appropriate certification for the equipment they are using

Both required:

- ensure the pesticide has aquatic approval

- seek environmental agency approval

## Topic 1.2

May include:

- extra person present at all times
- comply with relevant codes of practice
- availability of life ring/rescue devices
- personal flotation device
- be aware of any safety implications imposed by COSHH/Risk Assessment and comply with the requirements

Factors which may affect the speed of the boat:

- wind speed
- water flow
- weed obstruction

---

## Learning outcome

The learner will:

LO2 Be able to assess the environmental factors relating to mixing and application (**Criteria 2.1 – 2.2**)

## Assessment criteria

The learner can:

AC2.1 Identify risks to the aquatic environment

AC2.2 Explain how to minimise risks to the environment

## Topic 2.1

May include:

- wildlife
- non-target plants
- hedgerows
- housing
- public access
- sensitive crops/areas
- water courses
- boreholes
- livestock drinking points
- recreational use
- water extraction points
- de-oxygenation of water
- removal of fish cover
- removal of bank side wildlife habitat
- removal of bank side vegetation leading to bank erosion
- other risks specific to the site

## Topic 2.2

May include:

- work in an upstream direction (if applicable)
- treat the permitted area only
- check weather suitability before treatment
- check downstream uses before treatment
- inform neighbours/downstream users before application
- use an appropriate pesticide (minimal environmental impact)
- careful timing of treatment
- check and maintain application rate
- avoid spray drift
- exclude livestock
- erect warning signs

Check and comment on wind speed:

- use of anemometer or visible signs at suitable height
- wind direction

Factors that affect uniformity of spread

- applicator levelled according to manufacturer's recommendations
- applicator at correct height
- correct settings of spreading mechanism
- consistency of disc speed
- size/density of granules
- wind
- boat forward speed

---

## Learning outcome

The learner will:

LO3 Be able to read and interpret product information (**Criteria 3.1 – 3.2**)

## Assessment criteria

The learner can:

AC3.1 Read product information

AC3.2 Interpret product information

## Topic 3.1 - Topic 3.2

May include the following:

- product name
- active substance(s) (ingredient(s))

Important information:

- field of use (aquatic)
- target
- maximum individual dose
- maximum total dose

- maximum number of treatments
- specific product precautions/warnings
- operator protection
- environmental protection
- restrictions on use

Crop specific information:

- target
- dose rate
- timing
- filling recommendations
- additional label information

---

## Learning outcome

The learner will:

LO4 Be able to prepare and calibrate the applicator (**Criteria 4.1 – 4.5**)

## Assessment criteria

The learner can:

AC4.1 Identify applicator components and controls

AC4.2 Carry out pre use checks to the boat

AC4.3 Carry out pre-use and operational checks to the applicator

AC4.4 Calibrate the applicator and record relevant data

AC4.5 Calculate the quantities of pesticide required for a specified area/volume

## Topic 4.1

May include:

- on/off control
- metering mechanism
- bias mechanism
- hopper
- lid
- emptying outlet/mechanism
- agitator
- disc speed control
- spread width limiter
- other controls specific to the applicator

## Topic 4.2

May include:

- suitable for the situation
- accessibility of boat controls
- accessibility of applicator controls
- even loading
- outboard motor
- applicator power source
- presence of personal flotation device

## Topic 4.3

Security of attachment:

- fasteners tight
- straps inspected and adjusted if necessary

Possible mechanical defects:

- seized, worn or damaged controls/components
- electrical connectors

Applicator lubrication:

- identification of lubrication points
- visual inspection of lubrication points
- visual inspection of levels
- any problems identified to be rectified if within operators level of responsibility and ability

Use of control panel may include:

- functions of control panel
- recognition of malfunctions before and during operation
- check accuracy of base settings
- switch to manual/test mode where applicable

Part fill applicator:

- suitable site selected
- safe, secure mooring when transferring pesticides
- fill by usual on-site method, following approved procedures

Action in event of control panel failing:

- stop pesticide application
- manual operation of controls if possible

## Topic 4.4

Select and record boat forward speed:

- direction of travel (upstream or downstream)
- suitable boat forward speed for target
- appropriate engine speed established
- accurate measurement of distance
- accurate measurement of time taken to cover distance

- correct use of formula to establish forward speed
- use of manufacturers handbook/application charts

Calculate required output:

- correct use of formula

Set applicator:

- use of manufacturers handbook/application charts

Check and adjust applicator:

- follow recommendations given in manufacturers operator handbook
- run applicator for specific period of time or distance
- care to avoid moving parts
- collect product distributed (if applicable)
- accurate weighing of output
- compare with target rates (check product label)
- repeat until target rates achieved

Recorded data:

- applicator settings
- granule used for calibration
- application rate achieved
- spreading width
- engine speed
- boat forward speed

#### Topic 4.5

To include:

- the correct amount required for the specified area or volume

### Learning outcome

The learner will:

LO5 Be able to operate the application equipment (**Criteria 5.1 – 5.4**)

### Assessment criteria

The learner can:

AC5.1 Measure the required quantities and add to the applicator

AC5.2 Demonstrate safe and accurate application procedures

AC5.3 Carry out all activities protecting human health and the environment

AC5.4 Complete a treatment record

#### Topic 5.1

To include:

- safe, secure mooring when transferring pesticides and equipment



- correct selection and use of PPE/RPE (as required by the product label and/or COSHH/Risk Assessment)
- suitable site selected
- fill by usual on-site method, following approved procedures
- accurate measurement of pesticide
- correct filling procedure
- avoidance of spillage

### **Topic 5.2**

Methods to achieve accurate application

Marking out the site to include:

- marker poles
- blob markers
- buoys
- GPS

Procedure to refill applicator part way through application:

- mark the spot at which the applicator emptied
- refill applicator
- continue applying by accurately matching at the appropriate point

Demonstrate safe and accurate application procedures to include:

- ensure applicator is level
- applicator set at the correct height
- operate controls to start and finish applying accurately at beginning and end of each bout
- maintain correct boat forward speed
- accurate matching of bouts
- awareness of techniques to counteract unbalanced applicator performance
- coping with obstacles
- correct application rate
- check uniformity of spread
- all areas treated, minimising overlaps or misses
- awareness of changes in wind speed and direction

### **Topic 5.3**

To include:

- prevention of personal injury and contamination through correct selection and use of PPE/RPE (as required by the product information, COSHH/Risk Assessment)
- prevention of public/bystander contamination
- safe filling procedure
- avoidance of off target application/contamination
- avoidance of over dosing/under dosing target/plant material
- minimising the impact on the aquatic environment

### **Topic 5.4**

Completion of the treatment record must be:

- accurate
- legible (if handwritten)

---

## Learning outcome

The learner will:

LO6 Know how to carry out post-operational procedures (**Criteria 6.1 – 6.3**)

## Assessment criteria

The learner can:

AC6.1 Explain how to manage surplus pesticide and waste material

AC6.2 Explain how to clean and decontaminate the applicator and the boat

AC6.3 Describe the storage requirements for the applicator

### Topic 6.1

Recovering surplus granular pesticide:

- avoid personal contamination
- select appropriate PPE/RPE
- ensure that the applicator is made safe (engine stopped, power isolated)
- select appropriate site
- appropriate container used
- correct product information attached

Storing surplus granules

- return to temporary mobile store
- return to fixed storage facility

Waste packaging

- packaging thoroughly emptied
- placed in secure storage until disposal
- collection via a licensed waste disposal contractor

### Topic 6.2

May include:

- danger of personal contamination
- select appropriate PPE
- select an appropriate containment site
- appropriate containers for contaminated material
- follow manufacturers cleaning procedure
- ensure that the applicator is made safe (engine stopped, power isolated)
- suitable containment/disposal of granules or contaminated arisings from cleaning operation
- appropriate bio-security measures implemented
- when the applicator should be cleaned, ensure covers when under repair

### Topic 6.3

May include:

- refer to manufacturers handbook
- ensure applicator is clean and decontaminated
- inspect for wear and damage
- replace any worn or damaged parts
- carry out lubrication procedures
- store under cover and out of direct sunlight
- store in a secure area

## Unit 142

# Operating boat mounted granular applicators for applying pesticides to water

## Supporting information

### Evidence requirements

Assessment carried out by oral questioning and practical observation.

### Unit guidance

Candidates must successfully achieve all assessment activities in their chosen unit(s).

### Safe Practice

The Assessor and Candidate must wear Personal Protective Equipment (PPE) when appropriate.

The Assessor must ensure that a Site Specific Risk Assessment is carried out.

All equipment must be operated in such a way that the Candidate, Assessor, other persons and the environment are not endangered. Failure to operate safely and comply with these requirements will result in the Candidate not meeting the required standard.

A breach of Health and Safety that puts any person at risk during the assessment process will result in the assessment being terminated and the Candidate not meeting the required standard. The Assessor may stop the assessment on the grounds of safety at any time at their discretion.

**Candidates who undertake this assessment and have met the requirements are reminded of their legal obligation to receive/undertake appropriate additional training in the use of any equipment that differs from that used during the assessment, but which they are nevertheless qualified to use.**

### Suggested learning resources

Code of Practice for Using Plant Protection Products.

This is available from [www.hse.gov.uk](http://www.hse.gov.uk)

## Unit 143

# Operating boat mounted applicators for applying pesticides to water

<b>Level:</b>	2
<b>GLH:</b>	28
<b>Assessment type:</b>	Practical Observation with Oral Questioning
<b>Aim:</b>	The aim of this unit is for the candidate to safely operate mounted applicators for applying pesticides to water

### Learning outcome

The learner will:

LO1 Know the legislative and safety regulations relating to application equipment (**Criteria 1.1 – 1.2**)

### Assessment criteria

The learner can:

AC1.1 Describe the legal requirements relating to applying pesticides using boat mounted applicators

AC1.2 Describe how to apply pesticides safely using boat mounted applicators following industry best practice

#### Topic 1.1

The term on or near water may include the following:

- any areas, which include drainage channels, streams, rivers, ponds, lakes, reservoirs, canals and dry ditches and the banks or areas immediately adjacent

Operating legal requirements:

- all required guards are in place and equipment complies with legal requirements
- comply with The Plant Protection Products (Sustainable Use) Regulations 2012
- the operator must hold the appropriate certification for the equipment they are using

Applying pesticide legal requirements:

- ensure the pesticide has aquatic approval
- seek environmental agency approval

## Topic 1.2

May include:

- extra person present at all times
- comply with relevant codes of practice
- availability of life ring/rescue devices
- personal flotation device
- be aware of any safety implications imposed by COSHH/Risk Assessment and comply with the requirements

Factors which may affect the speed of the boat:

- wind speed
- water flow
- weed obstruction

## Learning outcome

The learner will:

LO2 Be able to assess the environmental factors relating to mixing and application (**Criteria 2.1 – 2.2**)

## Assessment criteria

The learner can:

AC2.1 Identify risks to the aquatic environment

AC2.2 Explain how to minimise risks to the environment

## Topic 2.1

May include:

- wildlife
- housing
- public access
- water courses
- boreholes
- livestock drinking points
- recreational use
- water extraction points
- de-oxygenation of water
- other risks specific to the site

## Topic 2.2

May include:

- work in an upstream direction (if applicable)
- treat the permitted area only
- check weather suitability before treatment
- check downstream uses before treatment
- inform neighbours/downstream users before application

- use an appropriate piscicide (minimal environmental impact)
- careful timing of treatment
- check and maintain application rate
- exclude livestock
- erect warning signs

Check and comment on wind speed:

- use of anemometer or visible signs at suitable height
- wind direction

## Learning outcome

The learner will:

LO3 Be able to read and interpret product information (**Criteria 3.1 – 3.2**)

## Assessment criteria

The learner can:

AC3.1 Read product information

AC3.2 Interpret product information

### Topic 3.1 - Topic 3.2

May include the following:

- product name
- active substance(s) (ingredient(s))

Important information:

- field of use (aquatic)
- target
- maximum individual dose
- maximum total dose
- maximum number of treatments
- specific product precautions/warnings
- operator protection
- environmental protection
- restrictions on use

Crop specific information:

- target
- dose rate
- water volume
- timing

Mixing and spraying:

- filling
- recommended pressure
- additional label information

---

## Learning outcome

The learner will:

LO4 Be able to prepare and calibrate the applicator (**Criteria 4.1 – 4.5**)

## Assessment criteria

The learner can:

AC4.1 Identify applicator components and controls

AC4.2 Carry out pre use checks to the boat

AC4.3 Carry out pre-use and operational checks to the applicator

AC4.4 Calibrate the applicator and record relevant data

AC4.5 Calculate the quantities of piscicide and water required for a specified area

### Topic 4.1

May include:

- tank
- filters
- pump
- pressure gauge
- filling control and devices
- agitation control
- pressure or volume regulator/pressure relief valve
- on/off control
- boom isolators
- tank wash system
- valve positions
- boom pressure compensation
- distribution outlet
- other items specific to the applicator

### Topic 4.2

May include:

- suitable for the situation
- accessibility of boat controls
- accessibility of applicator controls
- even loading
- outboard motor
- applicator power source
- presence of personal flotation device
- no equipment on operator's back when operating from the boat



### Topic 4.3

Security of attachment:

- fasteners tight
- straps inspected and adjusted if necessary

Possible mechanical defects:

- seized, worn or damaged controls/components
- atomiser drives/electrical connectors

Applicator lubrication:

- identification of lubrication points
- visual inspection of lubrication points
- visual inspection of levels

Boom settings, suspension and break-back devices:

- boom suspension operational
- break-back efficiency
- height adjustment

Remove, clean and refit a filter

- remove and clean using appropriate method
- contain spillage
- check for defects, replace if damaged
- refit

Use of control panel may include:

- functions of control panel
- recognition of malfunctions before and during operation
- check accuracy of base settings
- switch to manual/test mode where applicable

Part fill applicator

- suitable site selected
- safe secure mooring when transferring piscicides
- fill by usual on-site method, following approved procedures
- clean water supply

Check applicator for leaks

- use higher than normal operating pressure
- lids and seals
- pipe work and connections
- control valves
- filters
- pressure gauge

Action in event of control panel failing:

- stop piscicide application
- manual operation of controls if possible

### Topic 4.4

Select and record boat forward speed:

- direction of travel (upstream or downstream)
- suitable boat forward speed for target
- appropriate engine speed established
- accurate measurement of distance
- accurate measurement of time taken to cover distance

- correct use of formula to establish forward speed

Calculate required output/volume rate

- correct use of formula

Operating pressure

- pressure as determined by manufacturers literature
- pressurise/purge appropriate to the system

Distribution outlet outputs

- measure output
- compare with target output
- vary pressure to make small adjustments
- or any other acceptable method

Calibration data

- boat identification
- boat engine speed
- applicator engine speed
- boat forward speed
- application volume
- pressure
- flow rate

#### Topic 4.5

To include:

- amount of water required for specified area/volume
- amount of piscicide required for specified area/volume
- amount of piscicide required for full tank

---

### Learning outcome

The learner will:

LO5 Be able to operate the application equipment **(Criteria 5.1 – 5.4)**

### Assessment criteria

The learner can:

AC5.1 Measure the required quantities and add to the applicator

AC5.2 Demonstrate safe and accurate application procedures

AC5.3 Carry out all activities protecting human health and the environment

AC5.4 Complete a treatment record

#### Topic 5.1

To include:

- safe, secure mooring when transferring piscicides and equipment
- correct selection and use of PPE/RPE (as required by the product label and/or COSHH/Risk Assessment)
- suitable site selected

- fill by usual on-site method, following approved procedures
- clean water supply
- accurate measurement of water
- accurate measurement of piscicide
- correct filling procedure
- use of filling device if fitted
- avoidance of spillage
- observance of piscicide manufacturer's instructions for mixing and agitation

## Topic 5.2

Methods to achieve accurate application

Marking out the site to include:

- marker poles
- blob markers
- buoys
- GPS

Procedure to refill applicator part way through application:

- mark the spot at which the applicator emptied
- refill applicator
- continue spraying by accurately matching at the appropriate point

Demonstrate safe and accurate application procedures to include:

- operate controls to start and finish applying accurately at the beginning and end of each bout
- correct forward speed and pressure for site conditions
- accurate matching of bouts/use of marking aids
- coping with obstacles
- all of specified area treated
- awareness of changes in wind speed and direction

## Topic 5.3

To include:

- prevention of personal injury and contamination through correct selection and use of PPE (as required by the product information, COSHH/Risk Assessment)
- prevention of public/bystander contamination
- safe filling procedure
- avoidance of off target application/contamination
- avoidance of over dosing/under dosing target
- minimising the impact on the aquatic environment

## Topic 5.4

Completion of the treatment record must be:

- accurate
- legible (if handwritten)

---

## Learning outcome

The learner will:

LO6 Know how to carry out post-operational procedures (**Criteria 6.1 – 6.3**)

## Assessment criteria

The learner can:

AC6.1 Explain how to manage surplus pesticide and waste material

AC6.2 Explain how to clean and decontaminate the applicator and the boat

AC6.3 Describe the storage requirements for the applicator

### Topic 6.1

Surplus concentrate pesticide

- return to temporary mobile store
- return to fixed store

Containers:

- triple rinsed
- placed in secure storage until disposal
- returned to supplier
- collected by licensed waste contractor

Packaging:

- thoroughly emptied
- placed in secure storage until disposal
- collected by a licensed waste disposal contractor

Surplus dilute pesticide

- back on to site as long as it is below the maximum dose rate
- collected by a licensed waste disposal contractor

### Topic 6.2

May include:

- select and use appropriate PPE
- appropriate site
- thorough washing with water and suitable cleaning agent (if recommended/required)
- internal and external surfaces
- use of in-built wash systems if provided
- care to ensure contamination 'hot-spots' are clean
- thorough flushing of systems
- appropriate bio-security measures implemented
- safe disposal of contaminated washings
- when cleaning should take place

- safe procedures followed

### **Topic 6.3**

May include:

- ensure the applicator is clean and dry
- inspect for wear and damage
- replace any worn or damaged parts
- controls left in appropriate positions
- frost protection measures implemented
- lubricate as required
- store undercover and out of direct sunlight
- store in a secure area

## Unit 143

# Operating boat mounted applicators for applying pesticides to water

## Supporting information

### Evidence requirements

Assessment carried out by oral questioning and practical observation.

### Unit guidance

Candidates must successfully achieve all assessment activities in their chosen unit(s).

### Safe Practice

The Assessor and Candidate must wear Personal Protective Equipment (PPE) when appropriate.

The Assessor must ensure that a Site Specific Risk Assessment is carried out.

All equipment must be operated in such a way that the Candidate, Assessor, other persons and the environment are not endangered. Failure to operate safely and comply with these requirements will result in the Candidate not meeting the required standard.

A breach of Health and Safety that puts any person at risk during the assessment process will result in the assessment being terminated and the Candidate not meeting the required standard. The Assessor may stop the assessment on the grounds of safety at any time at their discretion.

**Candidates who undertake this assessment and have met the requirements are reminded of their legal obligation to receive/undertake appropriate additional training in the use of any equipment that differs from that used during the assessment, but which they are nevertheless qualified to use.**

### Suggested learning resources

Code of Practice for Using Plant Protection Products.

This is available from [www.hse.gov.uk](http://www.hse.gov.uk)

## Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the [Centre document library](#) on [www.cityandguilds.com](http://www.cityandguilds.com) or click on the links below:

### **Centre Handbook: Quality Assurance Standards**

This document is for all approved centres and provides guidance to support their delivery of our qualifications. It includes information on:

- centre quality assurance criteria and monitoring activities
- administration and assessment systems
- centre-facing support teams at City & Guilds/ILM
- centre quality assurance roles and responsibilities.

The Centre Handbook should be used to ensure compliance with the terms and conditions of the centre contract.

### **Centre Handbook: Quality Assurance Standards**

This document sets out the minimum common quality assurance requirements for our regulated and non-regulated qualifications that feature centre-assessed components. Specific guidance will also be included in relevant qualification handbooks and/or assessment documentation.

It incorporates our expectations for centre internal quality assurance and the external quality assurance methods we use to ensure that assessment standards are met and upheld. It also details the range of sanctions that may be put in place when centres do not comply with our requirements or actions that will be taken to align centre marking/assessment to required standards. Additionally, it provides detailed guidance on the secure and valid administration of centre assessments.

### **Access arrangements: When and how applications need to be made to City & Guilds**

provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **Centre document library** also contains useful information on such things as:

- conducting examinations
- registering learners
- appeals and malpractice.

### **Useful contacts**

Please visit the Contact us section of the City & Guilds website, **Contact us**.

## City & Guilds

For over 140 years, we have worked with people, organisations and economies to help them identify and develop the skills they need to thrive. We understand the life-changing link between skills development, social mobility, prosperity and success. Everything we do is focused on developing and delivering high-quality training, qualifications, assessments and credentials that lead to jobs and meet the changing needs of industry.

We partner with our customers to deliver work-based learning programmes that build competency to support better prospects for people, organisations and wider society. We create flexible learning pathways that support lifelong employability because we believe that people deserve the opportunity to (re)train and (re)learn again and again – gaining new skills at every stage of life, regardless of where they start.

The City & Guilds community of brands includes Gen2, ILM, Intertrain, Kineo and The Oxford Group.

## Copyright

The content of this document is, unless otherwise indicated, © The City & Guilds of London Institute and may not be copied, reproduced or distributed without prior written consent. However, approved City & Guilds centres and learners studying for City & Guilds qualifications may photocopy this document free of charge and/or include a PDF version of it on centre intranets on the following conditions:

- centre staff may copy the material only for the purpose of teaching learners working towards a City & Guilds qualification, or for internal administration purposes
- learners may copy the material only for their own use when working towards a City & Guilds qualification.

The Standard Copying Conditions (see the City & Guilds website) also apply.

Contains public sector information licensed under the Open Government Licence v3.0.

Published by City & Guilds, a registered charity established to promote education and training.

City & Guilds of London Institute  
Giltspur House  
5–6 Giltspur Street  
London  
EC1A 9DE

**[cityandguildsgroup.com](http://cityandguildsgroup.com)**