# City & Guilds Level 2 Award In Safe Application of Pesticides using Self Propelled, Mounted or Trailed Horizontal Boom Sprayers (PA2) (0216-50)

**Version 1.1 (February 2025)**

## Assessment Pack – Candidate Version

| Version and date | Change detail | Section |
|---|---|---|
| 1.0 February 2024 | First version | All |
| 1.1 February 2025 | Unit Numbers updated<br>Formatted | Throughout |

# Contents

# Introduction

This assessment relates to the unit in the Qualification handbook. The assessment can be achieved at pass only. If any task is not yet met the candidate is unsuccessful.

This assessment is for the following units and learning outcomes:

**Unit 233** Operating mounted, trailed and self propelled hydraulic nozzle or rotary atomiser horizontal boom sprayers covering the following learning outcomes:

1. Know the legislative and safety regulations relating to application equipment
2. Be able to assess the environmental factors relating to the mixing and application site
3. Be able to read and interpret product information
4. Be able to prepare and calibrate the applicator
5. Be able to operate the application equipment
6. Know how to carry out post-operational procedures.

**Unit 234** Operating mounted, trailed and self propelled air/ fluid nozzle horizontal boom sprayers covering the following learning outcomes:

1. Know the legislative and safety regulations relating to application equipment
2. Be able to assess the environmental factors relating to the mixing and application site
3. Be able to read and interpret product information
4. Be able to prepare and calibrate the applicator
5. Be able to operate the application equipment
6. Know how to carry out post-operational procedures.

**Unit 235** Operating mounted, trailed and self propelled downward air assisted horizontal boom sprayers covering the following learning outcomes:

1. Know the legislative and safety regulations relating to application equipment
2. Be able to assess the environmental factors relating to the mixing and application site
3. Be able to read and interpret product information
4. Outcome 4. Be able to prepare and calibrate the applicator
5. Outcome 5. Be able to operate the application equipment
6. Outcome 6. Know how to carry out post-operational procedures.

**Unit 236** Operating mounted or trailed wick type applicators covering the following learning outcomes:

1. Know the legislative and safety regulations relating to application equipment
2. Be able to assess the environmental factors relating to the mixing and application site
3. Be able to read and interpret product information
4. Be able to prepare and calibrate the applicator
5. Be able to operate the application equipment
6. Know how to carry out post-operational procedures.

**Unit 237** Operating vehicle mounted kerb sprayers fitted with hydraulic nozzles/rotary atomisers covering the following learning outcomes:

1. Know the legislative and safety regulations relating to application equipment
2. Be able to assess the environmental factors relating to the mixing and application site
3. Be able to read and interpret product information
4. Be able to prepare and calibrate the applicator
5. Be able to operate the application equipment
6. Know how to carry out post-operational procedures.

General guidance on the requirements for assessment can be found in the Assessor Guidance General guidance on the requirements for assessment can be found in the Assessor Guidance document available on the City & Guilds web site **www.nptc.org.uk**

The assessor must complete the Practical Table mark sheet for each candidate which should be kept by the assessor for a minimum period of twelve months.

## Record of assessment (ROA)

A prepopulated record of assessment must be completed by the assessor following an assessment. The number of outcomes is listed above; these must be ticked into the relevant met or not met sections of the ROA.

## ARAS Forms

An Assessment Result Advice Slip (ARAS form) must be completed by the assessor following an assessment. The ARAS is not a certificate but, based on the evidence of the candidate's performance, it is a recommendation to City & Guilds that the candidate either met or not met the assessment criteria. All feedback is to be recorded by the assessor on the feedback section of the ARAS form.

## Assessment Time

The expected assessment time for this qualification is 1.5 – 3 hours.

## Summary of responsibilities in the assessment process

| Centre responsibilities | Candidate responsibilities | Assessor responsibilities |
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| 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) |

This is not an open book assessment, however additional technical information may be sought from the relevant manufacturer's operator manuals or any other appropriate training or safety publication.

# Practical observation descriptor table

## Unit 233 - Operating mounted, trailed and self propelled hydraulic nozzle or rotary atomiser horizontal boom sprayers

| Activity number and description from check list | | Assessment criteria |
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| 1.1 | Describe the legal requirements relating to applying pesticides using horizontal boom sprayers | May include:<br>• all required guards are in place and equipment<br>• complies with legal requirements<br>• comply with all relevant road traffic regulations when operating or transporting on the public highway<br>• comply with The Plant Protection Products (Sustainable Use) Regulations 2012<br>• the operator must hold the appropriate certification for the equipment they are using |
| 1.2 | Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | Operator safety regulations may include:<br>• comply with Pesticide Codes of Practice adopt industry best practice<br>• be aware of any safety implications imposed by Risk/COSHH assessment and comply with the requirements<br>Checks to protect self from pesticide contamination:<br>Sealed cab:<br>• fit carbon filter<br>• use of in-cab controls<br>• ensure ventilation system is functional close all windows<br>• contaminated PPE stored in external locker<br>• awareness of the siting of pressurised components within confines of cab<br>Open cab/canopy/platform:<br>• use of appropriate PPE<br>• awareness of the siting of pressurised components within confines of cab/canopy/platform<br>Checks to protect self from physical danger during operation: |

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| | | • compatibility of prime mover and sprayer front weights<br>• wheel track width<br>• correct tyre pressures<br>• condition of tyres<br>• brake function<br>Safe practice when driving on uneven/sloping terrain:<br>• assess conditions<br>• select four wheel drive<br>• appropriate speed<br>• correct gear selection<br>• effect of changing load on stability<br>• use of weights to stabilise prime mover<br>• correct turning procedure<br>• keep centre of gravity as low as possible<br>Consideration for safe driving on a public highway:<br>• independent brakes coupled together<br>• travelling at high speed makes vehicle unstable |
| **2.1** | Identify risks to the environment | May include:<br>• ground conditions<br>• water courses<br>• environmental margins/strips/areas<br>• drains<br>• boreholes<br>• wildlife<br>• non-target plants<br>• sensitive crops/areas<br>• hedgerows<br>• housing<br>• public access<br>• other risks particular to the site |
| **2.2** | Explain how to minimise risks to the environment | Explanation may include the following points:<br>• check and maintain application rate<br>• avoid spray drift<br>• avoid off target application<br>• observe buffer zones<br>• comply with LERAP requirements<br>• inform neighbours<br>• erect warning signs<br>• use an appropriate pesticide (minimal environmental impact)<br>• appropriate timing of application |

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| | | Minimising spray drift:<br>• avoidance of contamination to people and the environment<br>Check wind speed and direction:<br>• use of an anemometer at suitable height or visual signs<br>• wind direction<br>Factors that affect spray drift:<br>• weather conditions<br>• direction of spraying<br>• nozzle type and size<br>• pressure<br>• forward speed<br>• boom height<br>• rotary atomiser speed<br>• defective equipment |
| **3.1 - 3.2** | Read product information<br><br>Interpret product information | May include the following:<br>• product name<br>• active substance(s) (ingredient(s))<br>Important information:<br>• field of use<br>• crop/target<br>• maximum individual dose<br>• maximum total dose<br>• maximum number of treatments<br>• specific product precautions/warnings<br>• operator protection<br>• environmental protection<br>• restrictions on use<br>Crop specific information:<br>• crop/target<br>• dose rate<br>• water volume<br>• timing<br>Mixing and spraying:<br>• filling<br>• reduced volume applications (if applicable)<br>• recommended nozzles<br>• recommended pressure<br>• spray quality<br>• additional label information<br>• compatibility |
| **4.1** | Identify applicator components and controls | May include:<br>• main spray tank<br>• pump |

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| | | • pulsation damper<br>• filling control and devices<br>• agitation control<br>• pressure adjustment control<br>• pressure gauge<br>• on/off control<br>• boom isolators<br>• boom section pressure compensation controls<br>• filters<br>• tank wash system<br>• clean water tank(s)<br>• nozzles/atomisers<br>• diaphragm check valves<br>• tank drain<br>• other components/controls specific to the applicator<br>Nozzle types:<br>• flat fan – fine/medium/coarse spray<br>• air inclusion – medium/coarse spray, low-drift<br>• cone – fine spray, good coverage |
| **4.2** | Carry out pre-use checks to the prime mover | May include:<br>• guards in place and in good condition<br>• visual inspection of the wheels and tyres<br>• tyre pressures<br>• fuel level adequate<br>• engine oil level is within acceptable limits<br>• hydraulic oil level is within acceptable limits (if accessible)<br>• transmission oil level is within acceptable limits (if accessible)<br>• coolant level is adequate<br>• engine air filter is clean |
| **4.3** | Carry out pre-use and operational checks to the sprayer | May include all/some of the following as applicable to the sprayer/applicator:<br>Security of attachment<br>• safe unfolding of booms to avoid personal contamination and contact with Over Head Power Lines (OHPL) and any other overhead hazards<br>• fasteners tight<br>• straps inspected and adjusted if necessary<br>• linkage secure<br>• sideways movement restricted<br>• drawbar pin secured |

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| | | Possible mechanical defects:<br>• seized, worn or damaged controls/components<br>• atomiser drives and electrical connectors<br>Applicator lubrication:<br>• identification of lubrication points<br>• visual inspection of lubrication points<br>• visual inspection of levels<br>Boom settings, suspension and break-back devices:<br>• boom suspension operational<br>• break-back efficiency<br>• height adjustment<br>Candidate to remove, clean and refit filter:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects, replace if damaged<br>• refit<br>Candidate to remove, clean and refit a nozzle/restrictor:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects replace if worn/damaged<br>• refit<br>Use of control panel may include:<br>• functions of control panel<br>• recognition of malfunctions before and during operation<br>• check accuracy of base settings<br>• switch to manual/test mode where possible<br>Part fill applicator to include:<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>Check for leaks/spray patterns:<br>• suitable site selected<br>• use higher than normal operating pressure<br>• visual check of all nozzles/atomisers for correct spray patterns, absence of blockages, streaking, pulsing<br>• correct alignment |

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| | | • replace defective nozzles/atomisers/discs<br>• lids and seals<br>• pipe work and connections<br>• control valves<br>• filters<br>• pressure gauge<br>• diaphragm check valves<br>Action in event of control panel failing:<br>• stop pesticide application<br>• manual operation of controls if possible |
| **4.4** | Calibrate the sprayer and record relevant data | Calibration may include the following:<br>• suitable forward speed for crop/target and ground conditions<br>• appropriate gear selected and engine speed established<br>• accurate measurement of distance<br>• accurate measurement of time taken to cover distance correct use of formula to establish forward speed<br>• correct use of formula to establish forward speed<br>Calculate required output/volume rate:<br>• correct use of formula<br>Selection of nozzle/atomiser:<br>• use of manufacturers operator's handbook<br>• use of nozzle/atomiser manufacturers literature<br>• confirm requirements of product label<br>Operating pressure/disc speed:<br>• pressure as determined by nozzle chart<br>• disc speed as determined by manufacturers literature<br>• pressurise/purge appropriate to the system<br>Nozzle/atomiser outputs:<br>• use a measuring jug to check output from at least outputs one nozzle/atomiser per boom section (minimum of three per applicator)<br>• compare with target output<br>• vary pressure to make small adjustments<br>• change nozzles/atomisers if required<br>• or any other acceptable method<br>Calibration data:<br>• registration number of vehicle |

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| | | • tyre size and pressure<br>• gear selected<br>• engine speed<br>• vehicle forward speed<br>• application volume<br>• nozzle/atomiser fitted<br>• pressure/disc speed<br>• flow rate |
| **4.5** | Calculate the quantities of pesticide and water required | To include:<br>• amount of water required for specified area<br>• amount of pesticide required for specified area<br>• amount of pesticide required for full tank |
| **5.1** | Measure the required quantities and add to the sprayer | To include:<br>• correct selection and use of PPE (as required by the product label and/or COSHH assessment)<br>• observance of pesticide manufacturers<br>• instructions for mixing sequence and agitation (or other recommended method)<br>• suitable site selected<br>• clean water supply<br>• accurate measurement of water<br>• accurate measurement of pesticide<br>• use of filling device (if fitted)<br>• avoidance of spillage<br>• return to secure storage |
| **5.2** | Demonstrate safe and accurate application procedures | Methods to achieve accurate application<br>May include any of the following:<br>• tramlines<br>• crop rows<br>• blob markers<br>• marker poles<br>• marker dyes<br>• use of GPS<br>Refilling applicator part way through application<br>Explanation to include:<br>• avoid contact with contaminated crop<br>• mark the location at which the applicator emptied<br>• refill applicator<br>• continue spraying by accurately matching at the appropriate point |

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| | | Procedure when nozzle/restrictor becomes blocked during an application<br>Explanation to include:<br>• select and use appropriate PPE<br>• care not to walk in contaminated crop<br>• clean or replace nozzle/restrictor as appropriate<br>Demonstrate safe and accurate application procedures to include:<br>• ensure boom is level or aligned to the target<br>• correct boom height according to target and type of nozzle<br>• operate controls to start and finish applying accurately at the beginning and end of each bout<br>• correct forward speed and pressure<br>• accurate matching of bouts / use of driving aids<br>• coping with obstacles (if applicable)<br>• all of specified area treated, minimising overlaps and misses<br>• awareness of changes in wind speed and direction |
| **5.3** | Carry out all activities protecting human health and the environment | To include:<br>• prevention of personal injury and contamination through correct selection and use of PPE (as required by the product information and/or COSHH/Risk Assessment)<br>• prevention of public / bystander contamination<br>• safe filling procedure<br>• avoidance of spray drift<br>• avoidance of off-target application<br>• avoidance of over dosing/under dosing crop/target |
| **5.4** | Complete a treatment record | Completion of the treatment record must be:<br>• accurate<br>• legible (if handwritten) |
| **6.1** | Explain how to manage surplus pesticide and dispose of waste material | Surplus concentrate pesticide:<br>• return to temporary mobile store<br>• return to fixed store<br>Containers:<br>• triple rinsed<br>• placed in secure storage until disposal<br>• returned to supplier<br>• collected by licensed waste contractor |

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| | | Packaging:<br>• thoroughly emptied<br>• placed in secure storage until disposal<br>• collected by licensed waste disposal contractor<br>Surplus dilute pesticide:<br>• back on to site as long as it is below the maximum dose rate<br>• use on another approved crop/target<br>• treated by specialist treatment facility on site (e.g. a lined bio bed)<br>• collected by licensed waste disposal contractor |
| **6.2** | Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | May include:<br>• select and use appropriate PPE<br>• appropriate site<br>• thorough washing with water and suitable cleaning agent (if recommended/required)<br>• internal and external surfaces<br>• use of in-built wash systems if provided<br>• care to ensure contamination 'hot spots' are clean<br>• thorough flushing of systems<br>• safe disposal of contaminated washings<br>• when cleaning should take place<br>• safe procedures followed |
| **6.3** | Describe the storage requirements for the sprayer | May include:<br>• ensure the applicator is clean and dry<br>• inspect for wear and damage<br>• replace any worn or damaged parts<br>• controls left in appropriate positions<br>• frost protection measures implemented<br>• lubricate as required<br>• store undercover and out of direct sunlight<br>• store in a secure area |

## Unit 234 - Operating mounted, trailed and self propelled air / fluid nozzle horizontal boom sprayers

| Activity number and description from check list | | Assessment criteria |
|---|---|---|
| 1.1 | Describe the legal requirements relating to applying pesticides using horizontal boom sprayers with thin fluid nozzles | May include:<br>• all required guards are in place and equipment complies with legal requirements<br>• comply with all relevant road traffic regulations when operating or transporting on the public highway<br>• comply with The Plant Protection Products (Sustainable Use) Regulations 2012<br>• the operator must hold the appropriate certification for the equipment they are using |
| 1.2 | Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | Operator safety regulations may include:<br>• Comply with Pesticides Codes of Practice<br>• adopt industry best practice<br>• be aware of any safety implications imposed by Risk/COSHH Assessment and comply with the requirements<br>Checks to protect self from pesticide contamination:<br>Cabbed:<br>• fit carbon filter<br>• use of in-cab controls<br>• ensure ventilation system is functional<br>• close all windows<br>• contaminated PPE stored in external locker<br>• awareness of the siting of pressurised components within confines of the cab<br>Open cab/canopy/platform:<br>• use of appropriate PPE<br>• awareness of the siting of pressurised components within confines of the cab/canopy/platform<br>Checks to protect self from physical danger during operation:<br>• compatibility of prime mover and sprayer<br>• front weights<br>• wheel track width<br>• correct tyre pressures<br>• condition of tyres |

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| | | • brake function<br>Safe practice when driving on uneven/sloping terrain:<br>• assess conditions<br>• select four wheel drive (if fitted)<br>• appropriate speed<br>• correct gear selection<br>• effect of changing load on stability<br>• use of weights to stabilise prime mover<br>• correct turning procedure<br>• keep centre of gravity as low as possible<br>Consideration for safe driving on a public highway:<br>• independent brakes coupled together<br>• travelling at high speed makes vehicle unstable |
| **2.1** | Identify risks to the environment | May include:<br>• ground conditions<br>• water courses<br>• environmental margins/strips/areas<br>• drains<br>• boreholes<br>• wildlife<br>• non-target plants<br>• sensitive crops/areas<br>• hedgerows<br>• housing<br>• public access<br>• other risks particular to the site |

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| **2.2** | Explain how to minimise risk to the environment | Explanation to include the following points:<br>• check and maintain application rate<br>• avoid spray drift<br>• observe buffer zones<br>• comply with LERAP requirements<br>• inform neighbours<br>• erect warning signs<br>• use an appropriate pesticide (minimal<br>• environmental impact)<br>• careful timing of application<br>Minimising spray drift:<br>• avoidance of contamination to people and the environment<br>Check wind speed and direction:<br>• use of anemometer at suitable height or visual signs<br>• wind direction<br>Factors that affect spray drift:<br>• weather conditions<br>• direction of spraying<br>• restrictor size<br>• air pressure<br>• fluid pressure<br>• forward speed<br>• boom height<br>• defective equipment |
| **3.1 - 3.2** | Read product information<br><br>Interpret product information | The following to be provided:<br>• product name<br>• active substance(s) (ingredient(s))<br>Important information:<br>• field of use<br>• crop/target<br>• maximum individual dose<br>• maximum total dose<br>• maximum number of treatments<br>• specific product precautions/warnings<br>• operator protection<br>• environmental protection<br>• restrictions on use<br>Crop specific information:<br>• crop/target<br>• dose rate<br>• water volume<br>• timing<br>Mixing and spraying:<br>• filling |

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| | | • reduced volume applications (if applicable)<br>• recommended nozzles/restrictors<br>• recommended pressure<br>• spray quality<br>• additional label information<br>• compatibility |
| **4.1** | Identify applicator components and controls | May include:<br>• main spray tank<br>• pump<br>• compressor<br>• air inlet<br>• pressure relief device<br>• pulsation damper<br>• filling control and devices<br>• agitation control<br>• fluid pressure adjustment control<br>• air pressure adjustment control<br>• air and fluid pressure gauges<br>• on/off control<br>• boom isolators<br>• boom section pressure compensation controls<br>• filters<br>• tank wash system<br>• clean water tank<br>• nozzle flow restrictors<br>• nozzle flood jets<br>• diaphragm check valves<br>• tank drain<br>• other components/controls specific to the applicator<br>Nozzle restrictors:<br>• green (35) - 50-120 l/ha. Low volume application<br>• blue (40) 60 -150 l/ha. Medium volume application<br>• yellow (50) - 90-250 l/ha. High volume application |

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| **4.2** | Carry out pre-use checks to the prime mover | May include:<br>• guards in place and in good condition<br>• visual inspection of the wheels and tyres<br>• tyre pressures<br>• fuel level adequate<br>• engine oil level is within acceptable limits<br>• hydraulic oil level is within acceptable limits (if accessible)<br>• transmission oil level is within acceptable limits (if accessible)<br>• coolant level is adequate<br>• engine air filter is clean |
| **4.3** | Carry out pre-use and operational checks to the sprayer | May include all/some of the following as applicable to the sprayer/applicator:<br>Security of attachment<br>• Safe unfolding of booms to avoid personal contamination and contact with Over Head Power Lines (OHPL) and any other over head hazards<br>• fasteners tight<br>• straps inspected and adjusted if necessary<br>• linkage secure<br>• sideways movement restricted<br>• drawbar pin secured<br>Possible mechanical defects:<br>• seized, worn or damaged controls/components<br>Applicator lubrication:<br>• identification of lubrication points<br>• visual inspection of lubrication points<br>• visual inspection of levels<br>Boom settings, suspension and break-back devices:<br>• boom suspension operational<br>• break-back efficiency<br>• height adjustment<br>Candidate to remove, clean and refit filter:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• refit<br>Candidate to Remove, clean/replace and refit a nozzle restrictor and flood jet:<br>• remove and clean using appropriate method |

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| | | • contain spillage<br>• check for defects<br>• replace if worn/damaged<br>• refit<br>Use of control panel may include:<br>• functions of control panel<br>• recognition of malfunctions before and during operation<br>• check accuracy of calibration<br>• switch to manual/test mode where applicable<br>Part fill applicator to include:<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>Check for leaks/spray patterns:<br>• use higher than normal operating pressure<br>• visual check of all nozzles for correct spray patterns, absence of blockages, streaking, pulsing and correct alignment<br>• replace defective nozzle restrictors and/or flood jets<br>• lids and seals<br>• liquid and air pipe work and connections<br>• control valves<br>• filters<br>• liquid and air pressure gauge<br>• diaphragm check valves<br>Action in event of control panel failing:<br>• stop pesticide application<br>• manual operation of controls if possible |
| **4.4** | Calibrate the sprayer and record relevant data | Calibration may include the following:<br>• suitable forward speed for crop/target and ground conditions<br>• appropriate gear selected and engine speed established (if applicable)<br>• accurate measurement of distance<br>• accurate measurement of time taken to cover distance<br>• correct use of formula to establish forward speed<br>Calculate required output/volume rate:<br>• correct use of formula<br>Selection of nozzle restrictor:<br>• use of manufacturers operator's handbook |

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| | | • use of manufacturers literature<br>• confirm requirements of product label<br>Operating pressure for liquid and air:<br>• pressure as determined by manufacturers literature<br>• pressurise/purge appropriate to the system<br>Nozzle outputs:<br>• use a measuring jug to check output from at least one nozzle per boom section (minimum of three per applicator)<br>• compare with target output<br>• vary pressure to make small adjustments<br>• change nozzle restrictors and/or flood jets if required<br>• or any other acceptable method<br>Calibration data:<br>• registration number of vehicle<br>• tyre size and pressure<br>• gear selected<br>• engine speed<br>• vehicle forward speed<br>• application volume<br>• nozzle restrictor fitted<br>• air pressure<br>• liquid pressure<br>• flow rate |
| **4.5** | Calculate the quantities of pesticide and water required for a specified area | To include:<br>• amount of water required for specified area<br>• amount of pesticide required for specified area<br>• amount of pesticide required for full tank |
| **5.1** | Measure the required quantities and add to the sprayer | To include:<br>• Correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>• accurate measurement of water<br>• accurate measurement of pesticide<br>• correct filling procedure<br>• use of filling device if fitted<br>• avoidance of spillage |

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| | | • observance of pesticide manufacturers instructions for mixing and agitation |
| **5.2** | Demonstrate safe and accurate application procedures | Methods to achieve accurate application<br>May include any of the following;<br>• tramlines<br>• crop rows<br>• blob markers<br>• marker poles<br>• marker dyes<br>• use of GPS<br>Refilling applicator part way through application<br>Explanation to include:<br>• avoid contact with contaminated crop<br>• mark the spot at which the applicator emptied<br>• refill applicator<br>• continue spraying by accurately matching at the appropriate point<br>Procedure when nozzle/restrictor becomes blocked during an application<br>Explanation to include:<br>• select and use appropriate PPE<br>• care not to walk in contaminated crop<br>• clean or replace nozzle restrictor or flood jet as appropriate<br>Demonstrate safe and accurate application procedures to include:<br>• ensure boom is level or aligned to the target<br>• correct boom height according to target and type of nozzle<br>• operate controls to start and finish applying accurate application accurately at the beginning and end of each bout<br>• correct forward speed and pressure for site conditions<br>• accurate matching of bouts / use of driving aids<br>• coping with obstacles<br>• all of specified area treated, minimising overlaps and misses<br>• awareness of changes in wind speed and direction |

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| **5.3** | Carry out all activities protecting human health and the environment | To include:<br>• prevention of personal injury and contamination through correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• prevention of public / bystander contamination<br>• safe filling procedure<br>• avoidance of spray drift<br>• avoidance of off-target application<br>• avoidance of over dosing/under dosing<br>• crop/target |
| **5.4** | Complete a treatment record | Completion of the treatment record must be:<br>• accurate<br>• legible (if handwritten) |
| **6.1** | Explain how to manage surplus pesticide and dispose of waste material | Surplus concentrate pesticide:<br>• return to temporary mobile store<br>• return to fixed store<br>Containers:<br>• triple rinsed<br>• placed in secure storage until disposal<br>• returned to supplier<br>• collected by a licensed waste disposal contractor<br>Packaging:<br>• thoroughly emptied<br>• placed in secure storage until disposal<br>• collected by a licensed waste disposal contractor<br>Surplus dilute pesticide:<br>• back on to site as long as it is below the maximum dose rate<br>• use on another approved crop/target<br>• treated by specialist treatment facility on site (e.g. a lined bio bed)<br>• collected by a licensed waste disposal contractor |
| **6.2** | Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | May include:<br>• select and use appropriate PPE<br>• appropriate site<br>• thorough washing with water and suitable additive if required<br>• internal and external surfaces<br>• use of in-built wash systems if provided<br>• care to ensure contamination 'hot spots' are clean<br>• thorough flushing of systems |

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| | | • safe disposal of contaminated washings<br>• when cleaning should take place<br>• safe procedures followed |
| **6.3** | Describe the storage requirements for the sprayer | May include:<br>• ensure the applicator is clean and dry<br>• inspect for wear and damage<br>• replace any worn or damaged parts<br>• controls left in appropriate positions<br>• frost protection measures implemented<br>• lubricate as required<br>• store undercover and out of direct sunlight<br>• store in a secure area |

## Unit 235 - Operating mounted, trailed and self propelled downward air assisted horizontal boom sprayers

| Activity number and description from check list | | Assessment criteria |
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| 1.1 | Describe the legal requirements relating to applying pesticides using horizontal boom sprayer | May include:<br>• all required guards are in place and equipment complies with legal requirements<br>• comply with all relevant road traffic regulations when operating or transporting on the public highway<br>• comply with The Plant Protection Products (Sustainable Use) Regulations 2012<br>• the operator must hold the appropriate certification for the equipment they are using |
| 1.2 | Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | Operator safety regulations may include:<br>• comply with Pesticides Codes of Practice<br>• adopt industry best practice<br>• be aware of any safety implications imposed by Risk/COSHH Assessment and comply with the requirements<br>Checks to protect self from pesticide contamination:<br>Cabbed:<br>• fit carbon filter<br>• use of in-cab controls<br>• ensure ventilation system is functional<br>• close all windows<br>• contaminated PPE stored in external locker<br>• awareness of the siting of pressurised<br>• components within confines of the cab<br>Open cab/canopy/platform:<br>• use of appropriate PPE<br>• awareness of the siting of pressurised components within confines of the cab/canopy/platform<br>Checks to protect self from physical danger during operation:<br>• compatibility of prime mover and sprayer<br>• front weights<br>• wheel track width<br>• correct tyre pressures |

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| | | • condition of tyres<br>• brake function<br>Safe practice when driving on uneven/sloping terrain:<br>• assess conditions<br>• select four wheel drive (if fitted)<br>• appropriate speed<br>• correct gear selection<br>• effect of changing load on stability<br>• use of weights to stabilise prime mover<br>• correct turning procedure<br>• keep centre of gravity as low as possible<br>Consideration for safe driving on a public highway:<br>• independent brakes coupled together<br>• travelling at high speed makes vehicle unstable |
| **2.1** | Identify risks to the environment | May include:<br>• ground conditions<br>• water courses<br>• environmental margins/strips/areas<br>• drains<br>• boreholes<br>• wildlife<br>• non-target plants<br>• sensitive crops/areas<br>• hedgerows<br>• housing<br>• public access<br>• other risks particular to the site |
| **2.2** | Explain how to minimise risks to the environment | Explanation to include the following points:<br>• check and maintain application rate<br>• avoid spray drift<br>• observe buffer zones<br>• comply with LERAP requirements<br>• inform neighbours<br>• erect warning signs<br>• use an appropriate pesticide (minimal<br>• environmental impact)<br>• careful timing of application<br>Minimising spray drift:<br>• avoidance of contamination to people and the environment<br>Check wind speed and direction:<br>• use of anemometer at suitable heights or visual |

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| | | • wind direction<br>Factors that affect spray drift:<br>• weather conditions<br>• direction of spraying<br>• nozzle type and size<br>• air outlet/nozzle angle<br>• air assistance<br>• liquid pressure<br>• forward speed<br>• boom height<br>• defective equipment |
| **3.1 - 3.2** | Read product information<br><br>Interpret product information | The following to be provided:<br>• product name<br>• active substance(s) (ingredient(s))<br>Important information:<br>• field of use<br>• crop/target<br>• maximum individual dose<br>• maximum total dose<br>• maximum number of treatments<br>• specific product precautions/warnings<br>• operator protection<br>• environmental protection<br>• restrictions on use<br>Crop specific information:<br>• crop/targe<br>• dose rate<br>• water volume<br>• timing<br>Mixing and spraying:<br>• filling<br>• reduced volume applications (if applicable)<br>• recommended nozzles<br>• recommended pressure<br>• spray quality<br>• additional label information<br>• compatibility |
| **4.1** | Identify applicator components and controls | May include:<br>• main spray tank<br>• pump<br>• pressure relief device<br>• pulsation damper<br>• filling control and devices<br>• agitation control<br>• liquid pressure adjustment control |

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| | | • fan<br>• air intake<br>• air bag/sleeve<br>• fan speed adjustment control<br>• air outlet angle control<br>• fan speed indicator<br>• on/off control<br>• boom isolators<br>• boom section pressure compensation controls<br>• filters<br>• tank wash system<br>• clean water tank<br>• nozzles<br>• nozzle angle control<br>• diaphragm check valves<br>• tank drain<br>• other components/controls specific to the applicator<br>Nozzle types:<br>• flat flan – fine/medium/coarse spray<br>• air inclusion – medium/coarse spray, low drift<br>• cone – fine spray, good coverage |
| **4.2** | Carry out pre-use checks to the prime mover | May include:<br>• visual inspection of the wheels and tyres<br>• tyre pressures<br>• fuel level adequate<br>• engine oil level is within acceptable limits<br>• hydraulic oil level is within acceptable limits (if accessible)<br>• transmission oil level is within acceptable limits (if accessible)<br>• coolant level is adequate<br>• engine air filter is clean |
| **4.3** | Carry out pre-use and operational checks to the sprayer | May include all/some of the following as applicable to the sprayer/applicator:<br>Security of attachment<br>• Safe unfolding of booms to avoid personal contamination and contact with Over Head Power Lines (OHPL) and any other over head hazards<br>• fasteners tight<br>• straps inspected and adjusted if necessary<br>• linkage secure<br>• sideways movement restricted |

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| | | • drawbar pin secured<br>Possible mechanical defects:<br>• seized, worn or damaged controls/components<br>Applicator lubrication:<br>• identification of lubrication points<br>• visual inspection of lubrication points<br>• visual inspection of levels<br>Boom settings, suspension and break-back devices:<br>• boom suspension operational<br>• break-back efficiency<br>• height adjustment<br>Candidate to remove, clean and refit filter:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• refit<br>Candidate to remove, clean and refit a nozzle:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• replace if worn/damaged<br>• refit<br>Use of control panel may include:<br>• functions of control panel<br>• recognition of malfunctions before and during operation<br>• check accuracy of calibration<br>• switch to manual/test mode where applicable<br>Part fill applicator to include:<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>Check for air leaks/spray patterns:<br>use higher than normal operating pressure<br>• visual check of all nozzles for correct spray<br>• replace defective nozzles<br>• lids and seals<br>• liquid pipe work and connections<br>• air bag/sleeve<br>• control valves |

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| | | • filters<br>• liquid pressure gauge<br>• diaphragm check valves<br>Action in event of control panel failing:<br>• stop pesticide application<br>• manual operation of controls if possible |
| **4.4** | Calibrate the sprayer and record relevant data | Calibration may include the following:<br>• suitable forward speed for crop/target and ground conditions<br>• appropriate gear selected and engine speed established (if applicable)<br>• accurate measurement of distance<br>• accurate measurement of time taken to cover distance<br>• correct use of formula to establish forward speed<br>Calculate required output/volume rate:<br>• correct use of formula<br>Selection of nozzle/air speed:<br>• use of manufacturers operator's handbook<br>• use of manufacturers literature<br>• confirm requirements of product label<br>Operating pressure for liquid, and set air speed:<br>• liquid pressure as determined by manufacturers<br>• air speed as determined by manufacturers literature<br>• pressurise/purge appropriate to the system<br>Nozzle outputs:<br>• use a measuring jug to check output from at least one nozzle per boom section (minimum of three per applicator)<br>• compare with target output<br>• vary pressure to make small adjustments<br>• change nozzles if required<br>• or any other acceptable method<br>Calibration data:<br>• registration number of vehicle<br>• tyre size and pressure<br>• gear selected<br>• engine speed<br>• vehicle forward speed<br>• application volume |

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| | | • nozzles fitted<br>• liquid pressure<br>• flow rate |
| **4.5** | Calculate the quantities of pesticide and water required for a specified area | To include:<br>• amount of water required for specified area<br>• amount of pesticide required for specified area<br>• amount of pesticide required for full tank |
| **5.1** | Measure the required quantities and add to the sprayer | To include:<br>• correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>• accurate measurement of water<br>• accurate measurement of pesticide<br>• correct filling procedure<br>• use of filling device if fitted<br>• avoidance of spillage<br>• observance of pesticide manufacturers instructions for mixing and agitation |
| **5.2** | Demonstrate safe and accurate application procedures | Methods to achieve accurate application<br>May include any of the following:<br>• tramlines<br>• crop rows<br>• blob markers<br>• marker poles<br>• marker dyes<br>• use of GPS<br>Refilling applicator part way through application<br>Explanation to include:<br>• avoid contact with contaminated crop<br>• mark the spot at which the applicator emptied<br>• refill applicator<br>• continue spraying by accurately matching at the appropriate point<br>Procedure when nozzle/restrictor becomes blocked during an application<br>Explanation to include:<br>• select and use appropriate PPE<br>• care not to walk in contaminated crop<br>• clean or replace nozzle as appropriate |

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| | | Procedure in event of failure of air assistance system:<br>• stop spraying<br>• continue to spray without using downwards air assistance (if conditions allow)<br>Effects of increasing the speed of air assistance:<br>• keeps the air bag/sleeve inflated over its entire length<br>• a larger air volume is produced, which may;<br>  • improve penetration of the spray into the crop<br>  • lead to excessive drift<br>Adjusting air outlet angle and/or nozzle angle<br>Incline forward will:<br>• open the crop canopy and counteract the effect on the spray created by the forward speed of the sprayer<br>• counteract the effect on the spray created by a head wind<br>inclining rearward will:<br>• open the crop canopy and counteract the effect on the spray created by a tail wind<br>Demonstrate safe and accurate application procedures to include:<br>• ensure boom is level or aligned to the target<br>• correct boom height according to target and type of nozzle<br>• correct air speed according to target and conditions<br>• correct air outlet and nozzle angle according to target and conditions<br>• operate controls to start and finish applying accurately at the beginning and end of each bout<br>• correct forward speed and pressure for site conditions<br>• accurate matching of bouts / use of driving aids<br>• coping with obstacles<br>• all of specified area treated, minimising overlaps and misses<br>• awareness of changes in wind speed and direction |

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| **5.3** | Carry out all activities protecting human health and the environment | To include:<br>• prevention of personal injury and contamination through correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• prevention of public / bystander contamination<br>• safe filling procedure<br>• avoidance of spray drift<br>• avoidance of off target application<br>• avoidance of over dosing/under dosing crop/target |
| **5.4** | Complete a treatment record | Completion of the treatment record must be:<br>• accurate<br>• legible (if handwritten) |
| **6.1** | Explain how to manage surplus pesticide and dispose of waste material | Surplus concentrate pesticide:<br>• return to temporary mobile store<br>• return to fixed store<br>Containers:<br>• triple rinsed<br>• placed in secure storage until disposal<br>• returned to supplier<br>• collected by a licensed waste disposal contractor<br>Packaging:<br>• thoroughly emptied<br>• placed in secure storage until disposal<br>• collected by a licensed waste disposal contractor<br>Surplus dilute pesticide:<br>• back on to site as long as it is below the maximum dose rate<br>• use on another approved crop/target<br>• treated by specialist treatment facility on site (e.g. a lined bio bed)<br>• collected by a licensed waste disposal contractor |
| **6.2** | Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | May include:<br>• select and use appropriate PPE<br>• appropriate site<br>• thorough washing with water and suitable additive if required<br>• internal and external surfaces<br>• use of in-built wash systems if provided<br>• care to ensure contamination 'hot spots' are clean |

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| | | • thorough flushing of systems, including air bag/sleeve<br>• safe disposal of contaminated washings<br>• when cleaning should take place<br>• safe procedures followed |
| **6.3** | Describe the storage requirements for the sprayer | May include:<br>• ensure the applicator is clean and dry<br>• inspect for wear and damage<br>• replace any worn or damaged parts<br>• controls left in appropriate positions<br>• frost protection measures implemented<br>• lubricate as required<br>• store undercover and out of direct sunlight<br>• store in a secure area |

## Unit 236 - Operating mounted or trailed wick type applicators

| Activity number and description from check list | | Assessment criteria |
|---|---|---|
| 1.1 | Describe the legal requirements relating to applying pesticides using wick type applicators | May include:<br>• all required guards are in place and equipment complies with legal requirements<br>• comply with all relevant road traffic regulations when operating or transporting on the public highway<br>• comply with The Plant Protection Products (Sustainable Use) Regulations 2012)<br>• the operator must hold the appropriate certification for the equipment they are using |
| 1.2 | Describe how to apply pesticides safely using wick type applicators following industry best practice | Operator safety regulations may include:<br>• comply with Pesticides Codes of Practice<br>• adopt industry best practice<br>• be aware of any safety implications imposed by Risk/COSHH Assessment and comply with the requirements<br>Checks to protect self from pesticide contamination:<br>Cabbed:<br>• fit carbon filter<br>• use of in-cab controls<br>• ensure ventilation system is functional<br>• close all windows<br>• contaminated PPE stored in external locker<br>Open cab/canopy/platform:<br>• use of appropriate PPE<br>Checks to protect self from physical danger during operation:<br>• compatibility of prime mover and sprayer<br>• front weights<br>• wheel track width<br>• correct tyre pressures<br>• condition of tyres<br>• brake function<br>Safe practice when driving on uneven/sloping terrain:<br>• select four wheel drive (if fitted)<br>• appropriate speed<br>• correct gear selection |

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| | | • effect of changing load on stability<br>• use of weights to stabilise prime mover<br>• correct turning procedure<br>• keep centre of gravity as low as possible<br>Consideration for safe driving on a public highway:<br>• independent brakes coupled together<br>• travelling at high speed makes vehicle unstable |
| **2.1** | Identify risks to the environment | May include:<br>• ground conditions<br>• water courses<br>• environmental margins/strips/areas<br>• drains<br>• boreholes<br>• wildlife<br>• non-target plants<br>• sensitive crops/areas<br>• hedgerows<br>• housing<br>• public access<br>• other risks particular to the site |
| **2.2** | Explain how to minimise risks to the environment | Explanation to include the following points:<br>• check and maintain application rate<br>• observe buffer zones<br>• inform neighbours<br>• erect warning signs<br>• use an appropriate pesticide (minimal environmental impact)<br>• careful timing of application<br>Minimising off target application:<br>• avoidance of contamination to people and the environment |
| **3.1 - 3.2** | Read product information<br><br>Interpret product information | The following to be provided:<br>• product name<br>• active substance(s) (ingredient(s))<br>Important information:<br>• field of use<br>• crop/target<br>• maximum individual dose<br>• maximum total dose<br>• maximum number of treatments<br>• specific product precautions/warnings<br>• operator protection<br>• environmental protection |

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| | | • restrictions on use<br>Crop specific information:<br>• crop/target<br>• dose rate<br>• timing<br>• dilution rate<br>• mixing and filling<br>• additional label information<br>• compatibility |
| **4.1** | Identify applicator components and control | May include:<br>• main tank<br>• wick<br>• pump<br>• filling control and devices<br>• agitation control<br>• pressure adjustment control<br>• pressure gauge<br>• on/off control<br>• filters<br>• clean water tank<br>• nozzles/distribution system<br>• diaphragm check valves<br>• tank drain<br>• other components/controls specific to the applicator |
| **4.2** | Carry out pre-use checks to the prime mover | May include:<br>• guards in place and in good condition<br>• visual inspection of the wheels and tyres<br>• tyre pressures<br>• fuel level adequate<br>• engine oil level is within acceptable limits<br>• hydraulic oil level is within acceptable limits (if accessible)<br>• transmission oil level is within acceptable limits (if accessible)<br>• coolant level is adequate<br>• engine air filter is clean |
| **4.3** | Carry out pre-use and operational checks to the applicator | May include all/some of the following as applicable to the applicator:<br>Security of attachment<br>• Safe unfolding of booms to avoid personal of applicator mechanisms contamination and contact with Over Head Powerlines (OHPL) and any other over head hazards<br>• fasteners tight |

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| | | • straps inspected and adjusted if necessary<br>• linkage secure<br>• sideways movement restricted<br>• drawbar pin secured<br>Possible mechanical defects:<br>• seized, worn or damaged controls/components<br>• electrical connectors<br>• condition of wick<br>Applicator lubrication:<br>• identification of lubrication points<br>• visual inspection of lubrication points<br>• visual inspection of levels<br>Candidate to remove, clean and refit filter:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• refit<br>Part fill applicator to include:<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>Check for leaks/correct distribution:<br>• visual check of all nozzles/distribution system for even application to wick<br>• replace defective nozzles/distribution system components<br>• lids and seals<br>• pipe work and connections<br>• control valves<br>• filters<br>• pressure gauge<br>• diaphragm check valves |
| **4.4** | Set up the applicator and record relevant data | Set up may include the following:<br>• suitable forward speed for target and ground conditions<br>Frame settings:<br>• height adjustment<br>Prime wick:<br>• travel slowly forward to ensure even distribution<br>• time required to prime wick (wet/dry)<br>• adjust flow rate to wick<br>Operational data: |

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| | | • registration number of vehicle<br>• gear selected<br>• priming time for wick<br>• liquid pressure (if applicable)<br>• flow rate setting |
| **4.5** | Calculate the quantities of pesticide and water required for a specified area | To include:<br>• amount of water required for specified area<br>• amount of pesticide required for specified area<br>• amount of pesticide required for full tank |
| **5.1** | Measure the required quantities and add to the applicator | To include:<br>• correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>• accurate measurement of water<br>• accurate measurement of pesticide<br>• correct filling procedure<br>• use of filling device if fitted<br>• avoidance of spillage<br>• observance of pesticide manufacturers instructions for mixing and agitation |
| **5.2** | Demonstrate safe and accurate application procedures | Methods to achieve accurate application<br>May include any of the following:<br>• blob markers<br>• marker poles<br>• applicator wheelings<br>• use of GPS<br>Refilling applicator part way through application<br>Explanation to include:<br>• avoid contact with contaminated crop<br>• mark the spot at which the applicator emptied<br>• refill applicator<br>• continue application by accurately matching at the appropriate point<br>Problems when working on sideways sloping ground may include:<br>• increased saturation of lowest side of wick<br>• decreased saturation of highest side of wick |

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| | | Procedure when nozzle/restrictor becomes blocked during an application<br>Explanation to include:<br>• select and use appropriate PPE<br>• care not to walk in contaminated crop<br>• clean or replace nozzle/distribution system as appropriate<br>Demonstrate safe and accurate application procedures to include:<br>• ensure wick is level or aligned to the target<br>• correct wick height according to target<br>• operate controls to start and finish applying accurately to the target<br>• avoidance of over-saturating wick<br>• avoidance of under-saturating wick<br>• correct forward speed for site conditions<br>• accurate matching of bouts/use of driving aids<br>• coping with obstacles<br>• all of specified area treated, minimising overlaps and misses |
| **5.3** | Carry out all activities protecting human health and the environment | To include:<br>• prevention of personal injury and contamination through correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• prevention of public/bystander contamination<br>• safe filling procedure<br>• avoidance of drips from wick<br>• avoidance of off target application<br>• avoidance of over dosing/under dosing crop/target |
| **5.4** | Complete a treatment record | Completion of the treatment record must be:<br>• accurate<br>• legible (if handwritten) |
| **6.1** | Explain how to manage surplus pesticide and dispose of waste material | Surplus concentrate pesticide:<br>• return to temporary mobile store<br>• return to fixed store<br>Containers:<br>• triple rinsed<br>• placed in secure storage until disposal<br>• returned to supplier<br>• collected by a licensed waste disposal contractor<br>Packaging: |

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| | | • thoroughly emptied<br>• placed in secure storage until disposal<br>• collected by a licensed waste disposal contractor<br>Surplus dilute pesticide:<br>• back on to site as long as it is below the maximum dose rate<br>• use on another approved crop/target<br>• treated by specialist treatment facility on site (e.g. A lined bio bed)<br>• collected by a licensed waste disposal contractor |
| **6.2** | Explain how to clean and decontaminate the applicator and, if applicable, the prime mover | May include:<br>• select and use appropriate PPE<br>• appropriate site<br>• thorough washing with water and suitable additive if required<br>• internal and external surfaces<br>• cleaning of the wick<br>• thorough flushing of systems<br>• safe disposal of contaminated washings<br>• when cleaning should take place<br>• safe procedures followed |
| **6.3** | Describe the storage requirements for the applicator | May include:<br>• ensure the applicator is clean and dry<br>• inspect for wear and damage<br>• replace any worn or damaged parts<br>• controls left in appropriate positions<br>• frost protection measures implemented<br>• lubricate as required<br>• store undercover and out of direct sunlight<br>• store in a secure area |

## Unit 237 - Operating vehicle mounted kerb sprayers fitted with hydraulic nozzles/rotary atomisers

| Activity number and description from check list | | Assessment criteria |
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| 1.1 | Describe the legal requirements relating to applying pesticides using vehicle mounted kerb sprayers | May include:<br>• all required guards are in place and equipment complies with legal requirements<br>• comply with all relevant road traffic regulations when operating or transporting on the public highway<br>• comply with The Plant Protection Products (Sustainable Use) Regulations 2012<br>• the operator must hold the appropriate certification for the equipment they are using |
| 1.2 | Describe how to apply pesticides safely using vehicle mounted kerb sprayers following industry best practice | Operator safety regulations may include:<br>• comply with Pesticides Codes of Practice<br>• adopt industry best practice particular in respect of non-porous surfaces and risk of contamination of surface and ground water<br>• be aware of any safety implications imposed by Risk/COSHH Assessment and comply with the requirements<br>Checks to protect self from pesticide contamination:<br>Cabbed:<br>• fit carbon filter<br>• use of in-cab controls<br>• ensure ventilation system is functional<br>• close all windows<br>• contaminated PPE stored in external locker<br>• awareness of the siting of pressurised components within confines of the cab<br>Open cab/canopy/platform:<br>• use of appropriate PPE<br>• awareness of the siting of pressurised components within confines of the cab/canopy/platform<br>Checks to protect self from physical danger during operation:<br>• compatibility of prime mover and sprayer<br>• wheel track width |

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| | | • correct tyre pressures<br>• condition of tyres<br>• brake function<br>Safe practice when driving on uneven/sloping terrain:<br>• assess conditions<br>• appropriate speed<br>• correct gear selection<br>• effect of changing load on stability<br>• correct turning procedure<br>• keep centre of gravity as low as possible<br>Consideration for safe driving on a public highway:<br>• travelling at high speed makes vehicle unstable<br>• slow moving vehicle protocols |
| **2.1** | Identify risks to the environment | May include:<br>• hard surface run-off<br>• drains<br>• water courses<br>• environmental areas<br>• wildlife<br>• non-target plants<br>• sensitive crops/areas<br>• hedgerows<br>• housing<br>• public access<br>• other risks particular to the site |
| **2.2** | Explain how to minimise risks to the environment | Explanation to include the following points:<br>• check and maintain application rate<br>• avoid run-off<br>• avoid spray drift<br>• observe buffer zones<br>• inform neighbours<br>• appropriate warning signs<br>• use an appropriate pesticide (minimal environmental impact)<br>• careful timing of application<br>Minimising spray drift:<br>• avoidance of contamination to people and the environment<br>Check wind speed and direction:<br>• use of anemometer at suitable heights or visual signs<br>• wind direction<br>Factors that affect spray drift: |

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| | | • weather conditions<br>• direction of spraying<br>• nozzle type and size<br>• pressure<br>• forward speed<br>• nozzle height<br>• rotary atomiser speed<br>• defective equipment |
| **3.1 - 3.2** | Read product information<br><br>Interpret product information | The following to be provided:<br>• product name<br>• active substance(s) (ingredient(s))<br>Important information:<br>• field of use<br>• target<br>• maximum individual dose<br>• maximum total dose<br>• maximum number of treatments<br>• specific product precautions/warnings<br>• operator protection<br>• environmental protection<br>• restrictions on use<br>Target specific information:<br>• target<br>• dose rate<br>• water volume<br>• timing<br>Mixing and spraying:<br>• filling<br>• recommended nozzles<br>• recommended pressure<br>• spray quality<br>• additional label information |
| **4.1** | Identify applicator components and controls | May include:<br>• main spray tank<br>• pump<br>• filling control and devices<br>• agitation control<br>• pressure adjustment control<br>• pressure gauge<br>• on/off control<br>• boom isolators<br>• filters<br>• tank wash system<br>• clean water tank<br>• nozzles/atomisers/spray heads<br>• diaphragm check valves |

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| | | • tank drain<br>• other components/controls specific to the applicator<br>Nozzle types:<br>• Flat flan – fine/medium/coarse spray<br>• Air inclusion – medium/coarse spray, low drift |
| **4.2** | Carry out pre-use checks to the prime mover | May include:<br>• visual inspection of the wheels and tyres<br>• tyre pressures<br>• fuel level adequate/motive batteries charged<br>• oil level(s) within acceptable limits<br>• coolant level is adequate<br>• engine air filter is clean |
| **4.3** | Carry out pre-use and operational checks to the sprayer/applicator | May include all/some of the following as applicable to the sprayer/applicator:<br>Security of attachment<br>• fasteners tight<br>• straps inspected and adjusted if necessary<br>Possible mechanical defects:<br>• seized, worn or damaged controls/components<br>• atomiser drives and electrical connectors<br>Applicator lubrication:<br>• identification of lubrication points<br>• visual inspection of lubrication points<br>• visual inspection of levels<br>Spray head attachments/break-back devices<br>• height adjustment<br>• break-back efficiency<br>Candidate to remove, clean and refit filter:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• refit<br>Candidate to remove, clean/replace and refit a nozzle/restrictor/spray head:<br>• remove and clean using appropriate method<br>• contain spillage<br>• check for defects<br>• replace if worn/damaged<br>• refit |

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| | | Use of control panel may include:<br>• functions of control panel<br>• recognition of malfunctions before and during operation<br>• switch to manual/test mode where applicable<br>Part fill applicator to include:<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>Check for air leaks/spray patterns:<br>• or attach pesticide container<br>• use higher than normal operating pressure<br>• visual check of all nozzles/atomisers/spray heads for correct spray patterns, absence of blockages, streaking and pulsing<br>• replace defective nozzles/atomisers/spray heads lids and seals<br>• pipe work and connections<br>• control valves<br>• filters<br>• pressure gauge<br>• diaphragm check valves<br>Action in event of control panel failing:<br>• stop pesticide application<br>• manual operation of controls if possible |
| **4.4** | Calibrate the sprayer and record relevant data | Calibration may include the following:<br>• suitable forward speed for target and ground conditions<br>• appropriate gear selected and engine speed established (if applicable)<br>• accurate measurement of distance<br>• accurate measurement of time taken to cover distance<br>• correct use of formula to establish forward speed<br>Calculate required output/volume rate:<br>• correct use of formula<br>Selection of appropriate nozzle/atomiser/spray head:<br>• use of manufacturers operator's handbook<br>• use of nozzle/atomiser/spray head manufacturers literature<br>• confirm requirements of product label |

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| | | Operating pressure/disc speed:<br>• pressure as determined by nozzle chart<br>• disc speed as determined by manufacturers literature<br>• pressurise/purge appropriate to the system<br>Nozzle/atomiser/spray head outputs:<br>• use a measuring jug to check<br>• nozzle/atomiser/spray head output<br>• compare with target output<br>• vary pressure/flow rate to make small adjustments<br>• change nozzles/atomisers/spray heads if required<br>• Or any other acceptable method<br>Calibration data:<br>• registration number of vehicle<br>• tyre size and pressure<br>• gear selected<br>• engine speed<br>• vehicle forward speed<br>• application volume<br>• nozzle/atomiser/spray head fitted<br>• pressure/disc speed<br>• flow rate |
| **4.5** | Calculate the quantities of pesticide and water required, if applicable | To include:<br>• amount of water required for specified area<br>• amount of pesticide required for specified area<br>• amount of pesticide required for full tank |
| **5.1** | Measure the required quantities and add to the sprayer or attach pesticide container | To include:<br>• correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• suitable site selected<br>• fill by usual on-site method, following approved procedures<br>• clean water supply<br>• accurate measurement of water<br>• accurate measurement of pesticide<br>• correct filling procedure<br>• avoidance of spillage<br>• observance of pesticide manufacturers instructions for mixing and agitation<br>• correct selection and use of PPE (as required by the product label and/or COSHH Assessment) |

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| | | • suitable site selected<br>• container undamaged<br>• correct procedure for attaching container<br>• avoidance of spillage<br>• check for leakage |
| **5.2** | Demonstrate safe and accurate application procedures | Refilling applicator part way through application<br>Explanation to include:<br>• avoid contact with contaminated area<br>• mark the spot at which the applicator emptied<br>• refill applicator<br>• continue spraying by accurately matching at the appropriate point<br>Procedure when nozzle/restrictor/spray head becomes blocked during an application<br>Explanation to include:<br>• select and use appropriate PPE<br>• care not to walk on contaminated area<br>• clean or replace nozzle/restrictor/spray head as appropriate<br>Demonstrate safe and accurate application procedures to include:<br>• ensure spray head is aligned to the target<br>• correct spray head height to achieve compliance with hard-surface recommendations<br>• operate controls to apply accurately<br>• correct forward speed and pressure for site conditions<br>• coping with obstacles<br>• all of specified area treated<br>• awareness of changes in wind speed and direction |
| **5.3** | Carry out all activities protecting human health and the environment | To include:<br>• prevention of public / bystander contamination<br>• prevention of personal injury and contamination through correct selection and use of PPE (as required by the product label and/or COSHH Assessment)<br>• safe filling procedure<br>• avoidance of spray drift<br>• avoidance of off target application |

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| | | • avoidance of over dosing/under dosing target |
| **5.4** | Complete a treatment record | Completion of the treatment record must be:<br>• accurate<br>• legible (if handwritten) |
| **6.1** | Explain how to manage surplus pesticide and dispose of waste material | Surplus concentrate pesticide:<br>• return to temporary mobile store<br>• return to fixed store<br>Containers:<br>• triple rinsed<br>• placed in secure storage until disposal<br>• returned to supplier<br>• collected by a licensed waste disposal contractor<br>Packaging:<br>• thoroughly emptied<br>• placed in secure storage until disposal<br>• collected by a licensed waste disposal contractor<br>Surplus dilute pesticide:<br>• back on to site as long as it is below the maximum<br>• dose rate<br>• use on another approved target<br>• treated by specialist treatment facility on site (e.g. a lined bio bed)<br>• collected by a licensed waste disposal contractor |
| **6.2** | Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | May include:<br>• select and use appropriate PPE<br>• appropriate site<br>• thorough washing with water and suitable additive if required<br>• internal and external surfaces<br>• use of in-built wash systems if provided<br>• thorough flushing of systems<br>• safe disposal of contaminated washings<br>• when cleaning should take place<br>• safe procedures followed |

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| **6.3** | Describe the storage requirements for the applicator | May include:<br>• ensure the applicator is clean and dry<br>• inspect for wear and damage<br>• replace any worn or damaged parts<br>• controls left in appropriate positions<br>• frost protection measures implemented<br>• lubricate as required<br>• store undercover and out of direct sunlight<br>• store in a secure area |

# Appendix 1 Practical table

## Unit 233 - Operating mounted, trailed and self propelled hydraulic nozzle or rotary atomiser horizontal boom sprayers

**All** criteria must be achieved.

| Activity number and description | Achieved |
|---|---|
| 1.1 Describe the legal requirements relating to applying pesticides using horizontal boom sprayers | |
| 1.2 Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | |
| 2.1 Identify risks to the environment | |
| 2.2 Explain how to minimise risks to the environment | |
| 3.1 Read product information | |
| 3.2 Interpret product information | |
| 4.1 Identify applicator components and controls | |
| 4.2 Carry out pre-use checks to the prime mover | |
| 4.3 Carry out pre-use and operational checks to the sprayer | |
| 4.4 Calibrate the sprayer and record relevant data | |
| 4.5 Calculate the quantities of pesticide and water required | |
| 5.1 Measure the required quantities and add to the sprayer | |
| 5.2 Demonstrate safe and accurate application procedures | |
| 5.3 Carry out all activities protecting human health and the environment | |
| 5.4 Complete a treatment record | |
| 6.1 Explain how to manage surplus pesticide and dispose of waste material | |
| 6.2 Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | |
| 6.3 Describe the storage requirements for the sprayer | |

## Unit 234 - Operating mounted, trailed and self propelled air / fluid nozzle horizontal boom sprayers

**All** criteria must be achieved.

| Activity number and description | Achieved |
|---|---|
| 1.1 Describe the legal requirements relating to applying pesticides using horizontal boom sprayers with thin fluid nozzles | |
| 1.2 Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | |
| 2.1 Identify risks to the environment | |
| 2.2 Explain how to minimise risks to the environment | |
| 3.1 Read product information | |
| 3.2 Interpret product information | |
| 4.1 Identify applicator components and controls | |
| 4.2 Carry out pre-use checks to the prime mover | |
| 4.3 Carry out pre-use and operational checks to the sprayer | |
| 4.4 Calibrate the sprayer and record relevant data | |
| 4.5 Calculate the quantities of pesticide and water required for a specified area | |
| 5.1 Measure the required quantities and add to the sprayer | |
| 5.2 Demonstrate safe and accurate application procedures | |
| 5.3 Carry out all activities protecting human health and the environment | |
| 5.4 Complete a treatment record | |
| 6.1 Explain how to manage surplus pesticide and dispose of waste material | |
| 6.2 Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | |
| 6.3 Describe the storage requirements for the sprayer | |

## Unit 235 - Operating mounted, trailed and self propelled downward air assisted horizontal boom sprayers

**All** criteria must be achieved.

| Activity number and description | Achieved |
|---|---|
| 1.1 Describe the legal requirements relating to applying pesticides using horizontal boom sprayers | |
| 1.2 Describe how to apply pesticides safely using horizontal boom sprayers following industry best practice | |
| 2.1 Identify risks to the environment | |
| 2.2 Explain how to minimise risks to the environment | |
| 3.1 Read product information | |
| 3.2 Interpret product information | |
| 4.1 Identify applicator components and controls | |
| 4.2 Carry out pre-use checks to the prime mover | |
| 4.3 Carry out pre-use and operational checks to the sprayer | |
| 4.4 Calibrate the sprayer and record relevant data | |
| 4.5 Calculate the quantities of pesticide and water required for a specified area | |
| 5.1 Measure the required quantities and add to the sprayer | |
| 5.2 Demonstrate safe and accurate application procedures | |
| 5.3 Carry out all activities protecting human health and the environment | |
| 5.4 Complete a treatment record | |
| 6.1 Explain how to manage surplus pesticide and dispose of waste material | |
| 6.2 Explain how to clean and decontaminate the sprayer and, if applicable, the prime mover | |
| 6.3 Describe the storage requirements for the sprayer | |

## Unit 236 - Operating mounted or trailed wick type applicators

**All** criteria must be achieved.

| Activity number and description | Achieved |
|---|---|
| 1.1 Describe the legal requirements relating to applying pesticides using wick type applicators | |
| 1.2 Describe how to apply pesticides safely using wick type applicators following industry best practice | |
| 2.1 Identify risks to the environment | |
| 2.2 Explain how to minimise risks to the environment | |
| 3.1 Read product information | |
| 3.2 Interpret product information | |
| 4.1 Identify applicator components and controls | |
| 4.2 Carry out pre-use checks to the prime mover | |
| 4.3 Carry out pre-use and operational checks to the applicator | |
| 4.4 Calibrate the applicator and record relevant data | |
| 4.5 Calculate the quantities of pesticide and water required for a specified area | |
| 5.1 Measure the required quantities and add to the applicator | |
| 5.2 Demonstrate safe and accurate application procedures | |
| 5.3 Carry out all activities protecting human health and the environment | |
| 5.4 Complete a treatment record | |
| 6.1 Explain how to manage surplus pesticide and dispose of waste material | |
| 6.2 Explain how to clean and decontaminate the applicator and, if applicable, the prime mover | |
| 6.3 Describe the storage requirements for the applicator | |

## Unit 237 - Operating vehicle mounted kerb sprayers fitted with hydraulic nozzles/rotary atomisers

**All** criteria must be achieved.

| Activity number and description | Achieved |
|---|---|
| 1.1 Describe the legal requirements relating to applying pesticides using vehicle mounted kerb sprayers | |
| 1.2 Describe how to apply pesticides safely using vehicle mounted kerb sprayers following industry best practice | |
| 2.1 Identify risks to the environment | |
| 2.2 Explain how to minimise risks to the environment | |
| 3.1 Read product information | |
| 3.2 Interpret product information | |
| 4.1 Identify applicator components and controls | |
| 4.2 Carry out pre-use checks to the prime mover | |
| 4.3 Carry out pre-use and operational checks to the sprayer/applicator | |
| 4.4 Calibrate the sprayer and record relevant data | |
| 4.5 Calculate the quantities of pesticide and water required for a specified area | |
| 5.1 Measure the required quantities and add to the sprayer or attach pesticide container | |
| 5.2 Demonstrate safe and accurate application procedures | |
| 5.3 Carry out all activities protecting human health and the environment | |
| 5.4 Complete a treatment record | |
| 6.1 Explain how to manage surplus pesticide and dispose of waste material | |
| 6.2 Explain how to clean and decontaminate the applicator and, if applicable, the prime mover | |
| 6.3 Describe the storage requirements for the applicator | |

# Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with the handbook. To download the documents and to find other useful documents, go to **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 assessment: quality assurance standards**
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 & Guilds Quality Assurance processes visit: the **What is CASS?** and **Quality Assurance Standards** documents on the City & Guilds website.

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.

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