

Welcome

Horticultural Chemical Usage
(Level 2)

LNS-GNM-2011-1.1

Safety Briefing

In the unlikely event of an emergency; remain calm, take instruction from trainer.



Make note of the following:

- Exit door locations
- Location of first aid equipment
- Location of fire extinguishers and fire alarms
- Assembly area

Learning Outcomes

Learning Outcome 1: Recognise the dangers to environment, human and animal health of exposure to chemicals

Learning Outcome 2: Safely handle and store non-hazardous chemicals

Learning Outcome 3: Prepare equipment and tools to apply non-hazardous chemicals safely under supervision

Learning Outcome 4: Apply non-hazardous chemicals safely under supervision

Learning Outcome 5: Clean and store tools and equipment

Performance Criteria

- PC1.1: Recognise symptoms caused by chemical exposure
- PC1.2: Identify routes of absorption
- PC1.3: Identify common causes of exposure
- PC1.4: Select and put on appropriate personal protective equipment (PPE)
- PC1.5: Handle and assist contamination or spill
- PC1.6: Notify appropriate personal and supervisors of contamination or spills

Underpinning Knowledge

UK1.1: Regulations which impact upon all workplace practices including safety and health

UK1.2: Observation skills

UK1.3: Absorption methods of pesticides

UK1.4: Environmental effects of selected chemicals and how to minimise damaging effects of chemicals.

UK1.5: Identification and removal or minimisation of hazards and risks

Chemicals used in landscape maintenance



- Herbicides
- Fungicides
- Insecticides

Herbicides



Kill plants by differing modes of action:

- Contact
- Dessicant
- Systemic
- Translocated

Insecticides



Insecticides kill insects by modes of action including:

- Contact
- Ingested
- Systemic
- Translaminar
- Fumigant
- Ovicidal

Fungicides

Fungicides kill disease-causing fungi using modes of action such as:

- Protectant
- Eradicant
- Systemic
- Selective / non-selective
- Residual
- Hormone
- Pre-emergent / post emergent



Learning activity 1

Complete agrichemical term matching activity



Recognise symptoms when exposed to chemicals

- Headaches
- Nausea
- Fever
- Asthma
- Cramps
- Allergies
- Diarrhoea
- Dizziness
- Vomiting
- Convulsions



- Memory loss
- Blurred vision
- Rapid heartbeat
- Tightness in chest
- Flu like symptoms
- Respiratory paralysis
- Irritations to skin, eyes, nose and throat
- Muscle twitches
- Loss of coordination

Routes of absorption



By mouth (ingestion)

- Chemicals may be ingested accidentally through contaminated food or improper storage, e.g., keeping chemical in empty mineral water bottle

Routes of absorption



Through the skin (dermal)

- Chemicals may be absorbed through our eyes, skin or any cuts or open wounds.

Routes of absorption



Into the lungs (inhalation)

- Chemicals may be absorbed through inhaling while spraying on plants.

 **Learning activity 2**
Answer two questions

Common causes of exposure

Wind

Wind is a common cause for exposure.

If you are not careful while applying chemicals to plants, the chemical may be blown back onto you.

- Vapour drift
- Spray drift
- Odour drift



Common causes of exposure



Spills

- Usually occur due to improper storage.
- Always check the storage requirements and follow accordingly.
- Some of these requirements may include temperature, humidity level, etc.

Common causes of exposure

Incorrect Application Rate/ Applicator

- Incorrect application rate may result in the chemical being expressed too fast, which may cause exposure if you lose control.
- Wrong applicator or faulty applicator.
- Always check equipment thoroughly.



Common causes of exposure

Not wearing PPE

- Many people choose not to wear PPE due to comfort or laziness.
- In an accident PPE will be the layer that protects you from the chemical.
- Always wear PPE when coming into contact with chemicals.



Personal Protection Equipment (PPE)



Protective Visor

- Protect your face and eyes from splashes

Chemical Resistant Face Mask

- Protect you from inhaling harmful chemicals

Rubber Gloves

- Chemical resistant rubber gloves protect your hands

Personal Protection Equipment (PPE)

Safety Vest

- Make you visible, especially at night

Overalls / Raincoat

- Long sleeves protect your body
- Wear hood to protect ears and back of neck

Rubber Boots

- Protect feet from spillage



Learning activity 3

Write name of PPE item below each picture



Handle and assist contamination or spill

Major spills

- Evacuate
- Follow workplace emergency procedures
- Call emergency services

**SPILL KIT
STATION**

Handle and assist with contamination or spill

Minor spills

- Make sure you are protected
- Contain spill
- Absorb spill using sand
- Sweep up contaminated sand
- Use water and detergent



Notify contamination or spills

Inform supervisor of contamination or spills.



Performance Criteria

PC2.1: Read and understand basic hazard information found on MSDS and labels

PC2.2: Handle chemicals to store appropriately and as required by regulations

PC2.3: Select appropriate equipment for mixing and handling chemicals

PC2.4: Mix non-hazardous chemicals according to manufacturer's specifications for a given application

PC2.5: Recognise suitable weather conditions in which to apply chemicals

PC2.6: State where and when safety notices should be used

Underpinning Knowledge

UK2.1: Preparation of chemicals

UK2.2: Recognising suitable weather conditions for application of chemicals

UK2.3: Selection of safety signs and notices

Product label



Basic information includes:

- Hazard warnings and precautions
- Poisoning symptoms and first aid
- Transport and storage warnings
- Directions for use
- Withholding periods
- Re-entry periods
- Disposal instructions

Material Safety Data Sheet (MSDS)



- Specific to each individual agrichemical
- Copy must be readily available
- Contains 'in depth' information in 16 sections in set format / sequence

Chemical storage



- Store chemicals in original containers
- Store tightly closed
- Store similar agrichemicals together
- Keep herbicides separated
- Do not store agrichemicals with fuels, oil, pool chemicals, fertilisers, seeds or explosives

Requirements for chemical store

- Not close to waterways, drains, houses
- Well ventilated
- Good lighting
- Lockable
- Warning sign
- Able to contain spill
- Needs suitable spill kit and fire extinguisher
- Self containing drainage trays



 **Learning activity 4**
Complete checklist

Mixing chemicals



- Check right chemical for task
- Read label
- Wear PPE
- Measure accurately
- Replace lids immediately
- Dilute as soon as possible
- Only mix amount needed



Learning activity 5

Answer question

Recognise suitable weather conditions



Rain

- May dilute or wash away chemicals

Wind

- Can blow chemicals in wrong direction

Temperature

- Don't apply chemicals if the weather is too hot.

Safety notices



- Use when applying chemicals
- Ensure notices are visible to most people

Performance Criteria

PC3.1: Select and check appropriate application equipment and tools as directed

PC3.2: Check working condition of a selection of application equipment prior to filling with chemical

PC3.3: Check and start motorised sprayer following correct procedure

PC3.4: Carry out simple troubleshooting of the motorised sprayer following correct procedure.

PC3.5: Report any damage, wear or malfunctions identified to appropriate person

Underpinning Knowledge

- UK3.1: Types of application equipment and tools
- UK3.2: Functionality of application equipment and tools
- UK3.3: Checking of working condition of application equipment and tools

Spraying equipment



Simple pump bottles

- Hold small volumes
- Suit small scale projects

Spraying equipment



Knapsacks or backpacks

- Hold 10 – 15 litres
- Pumped by hand
- Suited to herbicides that don't need shaking or mixing

Spraying equipment



Motor-powered knapsacks

- Hold 10 – 15 litres
- Spray fine mist
- Good for reaching tall vegetation

Spraying equipment



Powered mobile tanks or small tanks on wheels

- Hold 50 litres of herbicides
- Use long hose to cover large/difficult to reach places

Tractor driven spray units

- Carry large amounts of spray
- Cover large areas easily

Checking working condition of equipment



- Fill with water to test
- Check for leaks
- Check nozzle
- Check equipment is clean



Learning activity 6

Complete pre-test checks on
spray bottles

Motorised sprayer



- Check enough fuel
- Mix petrol according to manufacturer's specifications
- Throttle switch at correct position prior to starting
- Put to correct throttle speed after machine is started
- Calibrate sprayer

Troubleshoot motorised sprayer



- Refer to manufacturer's operating manual
- Check fuel levels
- Check and tighten nozzle
- Clear blockages
- Adjust nozzle opening
- Replace strap if worn
- Replace nozzle if required
- Test using water

Report damage, wear or malfunctions

Report any damage, wear or malfunctions identified to your supervisor



Performance Criteria

PC4.1: Check surrounding area for hazards and difficult areas to spray

PC4.2: Assess weather conditions prior and during application of chemicals

PC4.3: Put on appropriate Personal Protective Equipment (PPE)

PC4.4: Handle applicator equipment according to correct procedure

PC4.5: Apply chemicals safely and effectively in accordance with workplace safety and health procedures and manufacturer's specifications

PC4.6: Take immediate action in case of chemical spillage as required by workplace safety and health and environmental pollution, control procedures and manufacturer's specifications

PC4.7: Apply basic first aid when chemical/s come in contact with skin or eyes

Underpinning Knowledge

UK4.1: Hazards identification, assessment and control

UK4.2: Assessing of weather conditions

UK4.3: Methods of chemical application

UK4.4: Safe and environmentally responsible work practices

Check for hazards and difficult areas to spray



- Sites close to waterways
- Steep and uneven terrain
- Proximity to humans, fauna and protected flora
- Neighbouring properties with potential for spray drift

Assess weather conditions

weather forecast



- Rain
- Wind
- Wet ground

Wear appropriate PPE

Wear appropriate PPE at all times when handling chemicals



Handheld sprayer



- Adjust nozzle to give suitable reach and coverage
- Check wind direction
- Spray in direction of wind
- Keep even pressure
- Use the hand pump regularly

Knapsack sprayer



- Check filter below lid opening before adding chemicals and/or water
- Check lid is on and air tight
- Check nozzle calibrated
- Check wind direction
- Spray in direction of wind
- Keep pumping regularly

Apply chemicals safely



Before application

- Read label or MSDS
- Ensure chemical suitable for task
- Know what PPE to wear
- Check qualifications

Apply chemicals safely

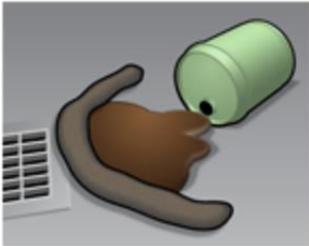
During application

- Comply with legal requirements and regulations
- Notify neighbours and staff
- Check equipment
- Wear and use PPE
- Check weather conditions
- Be aware of sensitive areas / buffering zones
- Have emergency plan
- Use signage

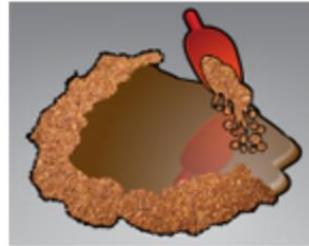


Main objectives of containing a chemical spill

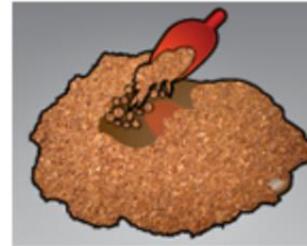
- Containing the flow of chemical into any waterway or body of water
- Soaking up all residue on hard ground
- Diluting all spilled chemical with water as quickly as possible.



Identify and isolate spill. Always follow workplace procedures for clean-up and disposal.



Apply absorbent to the perimeter of the spill to form a bund and stop spill migration.



Continue to apply absorbent working to the centre until spill is completely covered and no free liquid is visible.



Sweep with a stiff broom working dry material over spill area to remove all surface oil. Dispose of in accordance with local regulations.

Basic first aid

Chemical on skin

- Remove clothing
- Wash affected area
- Dry affected area
- Cover / wrap



Basic first aid



Chemical in eyes

- Wash eyes
- Rinse eyes for 15 minutes
- Flush water under eyelids
- Cover the eye

Take care not to contaminate other eye if only one involved

Basic first aid



Inhaled chemicals

- Carry person to fresh air
- Warn others
- Get person to lie down
- Loosen clothing, keep warm and quiet

Performance Criteria

PC5.1: Dispose of left over chemicals in appropriate containers in accordance with regulations and procedures

PC5.2: Wash down hands and body before proceeding with further work

PC5.3: Clean tools and equipment in appropriate manner.

PC5.4: Check working condition and report defective tools and equipment, if any, to appropriate person.

PC5.5: Clean and store personal protective equipment appropriately after use

PC5.6: Observe personal hygiene by ensuring all residue to cleaned from body

Underpinning Knowledge

UK5.1: Correct disposal of chemicals

UK5.2: Tools and equipment required to clean up chemicals and spillage

UK5.3: Cleaning process and techniques

UK5.4: Checking working condition of tools and equipment

UK5.5: Correct storage of tools, equipment and materials

Disposal of left over chemicals



- Find alternative use
- Return to manufacturer
- Local body collections
- Landfill disposal for low toxicity and low hazard agrichemicals
- Commercial waste disposal company



Learning activity 7

Complete True / False activity

Wash hands and body after handling chemicals



Always wash hands and body with soap and water before proceeding with other work

Clean tools and equipment

- Drain sprayer
- Clean and dry tools and equipment
- Store in assigned location
- Clean, tidy, reinstate worksite



Check tools and equipment

Put defective tools and equipment to one side and report to supervisor



Clean and store PPE



PPE must be cleaned, dried and stored in assigned locations

Remove all residue

Ensure all residues are thoroughly cleaned off body with running water



Assessment Information

1. Participants need to take assessment at assigned assessment sites
2. Assessment consists of :
 - Practical examination
 - Oral questioning
3. Assessor will assess candidate on performance criteria and knowledge items stated in competency standard