ALEP

22

Aboriginal Landcare Education Program

APPLY CHEMICALS UNDER SUPERVISION

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CONTENTS

PUBLICATION NOTES

BHP Billiton Iron Ore is proud to support Greening Australia to provide valuable conservation and land management training to communities throughout the Pilbara through the Indigenous Training Program.

This Learning Guide series has been developed as part of our partnership of the program.

Gavin Price, Head of Environment, BHP Billiton Iron Ore

Greening Australia is proud to produce and provide the comprehensive suite of new ALEP Learning Guides. The guides are compatible with the new horticulture and conservation industries training package and suited to developing skills in Indigenous communities within remote areas of the country where employment opportunities are limited. We would like to thank BHPBIO for their generous support in the development of the guides.

Brendan Foran, National CEO Greening Australia

The second series of ALEP Guides is aligned with a number of units of competence from the *Training Package AHC10 – Agriculture, Horticulture and Conservation and Land Management* (Release 8.0). The units selected are frequently used within Certificates I to III in Horticulture and Conservation and Land Management. As such they cover, where possible, the elements, performance criteria and required skills and knowledge of each unit.

The principal goal of these resources is to support the learning process; the learning activities may complement a trainer's assessment plan. The intent is that they will be used in an interactive manner with learners rather than as self-paced study guides. The structure and sequence have been designed to follow the logical steps of the practical tasks wherever possible. Concepts are introduced and then consolidated with discussion and/or practical activities.

The writers consider that these guides can provide a sound technical foundation but also strongly encourage trainers to complement the guides with additional, authentic resources from relevant industry texts and websites. The guides can be used in part or in their entirety but should always be linked to practical activities to strengthen the teaching and learning.

Genuine consideration was given to the level of language used in the guides. The goal has been to find a balance between simplifying the language to an accessible level and ensuring that the vocational concepts are addressed. The writers contend that with appropriate support these texts can provide an opportunity for students to strengthen their language, literacy and numeracy skills, which may be required for pathway progression.

A number of Aboriginal people have been involved in developing this ALEP Guide, which is considered suitable for use within a program based on Aboriginal pedagogies.

INTRODUCTION

Welcome to *Apply chemicals under supervision*. This learning guide covers information about using chemicals as part of a program to manage pests. The chemicals you use will depend on the problem and the surrounding environment. The chemicals might include liquid chemical mixes, powders, granular products and/or biological agents.

This learning guide can only present the broad ideas about chemical application. This knowledge needs to be used in practice as you carry out your duties in the field. Assessment of this unit can be clustered with other units from your qualification.

ALEP
Aboriginal Landcare Education Program

Much of the training for this unit should be completed on the job.

EQUIPMENT REQUIRED

To complete this training you will need the following:

1. Appropriate Personal Protective Equipment (PPE)
2. Safety gear, including first aid kit and drinking water
3. Equipment required to measure, mix and apply chemicals
4. Safety Data Sheets (SDSs) for the chemicals you will use
5. Codes of Practice and guidelines relevant to your state

LEARNING ACTIVITIES

There are five kinds of activities to complete. These activities may go toward your final assessment.

SECTION	ACTIVITY	SATISFACTORY (Y/N)	DATE
PRACTICAL ACTIVITIES			
1.2	Types of chemicals		
2.1	Reading labels		
2.3	Checking your PPE		
2.4	Pre-start check on spray equipment		
2.4	Adjust spray equipment		
2.8	SOPs and JSAs		
4.2	Storing chemicals		
5	Project – applying chemicals – create portfolio		
DISCUSSION ACTIVITIES			
Throughout	Pest problems, reading labels and SDSs, transporting chemicals, monitoring weather, spray drift, application methods, disposal of containers, monitoring, working with diversity, spills, emergencies, disposing of rinsate		
RESEARCH ACTIVITY			
1.5	Codes of Practice and guidelines		
WORKBOOK ACTIVITIES			
Throughout	Written responses to workbook questions (conducted verbally where appropriate)		
PROJECT			
5	Team work and individual portfolio		

1 BEFORE YOU START

In your work, you will come across situations where there is a problem caused by pests. In horticulture and conservation and land management (CLM) the word 'pest' is used to talk about plants, animals, insects and diseases that are causing a problem. Some examples of pest problems are:

- Weeds competing with native plants
- Weeds invading a waterhole or creek line
- Insects and/or disease damaging a food crop
- Introduced grasses and woody weeds affecting the intensity of fire
- Feral animals causing damage to the native environment

Some of them might be managed by applying chemicals, but some might be managed in other ways, such as slashing, culling, grazing, fencing and crop rotation.

DISCUSSION ACTIVITY

What pest problems exist in your area?

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How does your workplace solve the problems in your area?

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.....

.....

1.1 INTEGRATED PEST MANAGEMENT

Integrated Pest Management (IPM) is an approach to solving problems caused by pests. It aims to solve pest problems by using a combination of the most efficient and effective methods.

'Efficient' means that the solution uses the least money and effort.

'Effective' means that the solution manages the pest so it is no longer a problem.

IPM always looks for solutions that reduce the risk of environmental damage.

Actions are taken to control pests only when their numbers are likely to cause a problem. Just because a pest is observed, doesn't mean it is causing a problem.

IPM does not encourage the use of chemicals but recognises that sometimes they are needed as part of an integrated solution.

So when your supervisor chooses to use chemicals to manage a pest, it will be because there is no other way to solve the problem. This decision will be made after:

- Learning about the pest, its life cycle and natural enemies
- Attempting to prevent the problem from happening
- Monitoring the pest and deciding that the pest needs to be managed
- Considering all other control options

Both horticulture and CLM use IPM to solve problems caused by pests. The problems they need to solve will be different.

In horticulture the problem is likely to be that pests are damaging a crop. For example, weeds are a problem if they are taking over the vegetable garden.

In CLM the problem is likely to be environmental. For example, weeds are a problem if they are smothering a waterhole.

INTEGRATED PEST MANAGEMENT MODEL

1. LEARN
ABOUT THE PROBLEM

Why is the pest a problem?

- How is the pest causing the problem?
- Understand the life cycle of the pest (and its natural enemies)
- Understand crop rotation and crop life cycle (horticulture)
- Use books, fact sheets, internet, consultants and researchers

2. PREVENT
THE PROBLEM

- Site selection, variety of crop, crop rotation (horticulture)
- Good hygiene to stop contamination, e.g. take care not to carry weed seeds from one site to another
- Community education programs

3. MONITOR
THE SITUATION

- Watch for weeds, diseases, pest insects and beneficial species
- Conduct survey
- Record details

4. SELECT
CONTROL

Do you need to do anything to manage the problem?
Think about:

- The numbers of the pest
- The damage it is causing
- Any relevant legislation
- The life cycle stage of the pest
- The life cycle stage of the crop
- Environmental conditions

Options

- Exclusion, e.g. fencing
- Mechanical, e.g. weeding, slashing, mulching, ringbarking
- Biological, e.g. use other living things
- Chemical, e.g. apply spray, dust or granules

5. REVIEW
LOOK BACK, THINK AHEAD

- Look at the success and shortcomings of the management program
- Look at crop yields or survey data
- Look at the damage
- What worked?
- What needs to be done differently?
- What else needs to be done?

1.2 TYPES OF CHEMICALS

The chemicals you use will depend on the problem you are trying to solve. The word 'pesticide' refers to any substance used to manage pests. There are naturally occurring pesticides, but the most common ones used in the workplace are chemicals.

Pesticides can be broadly grouped as 'contact' or 'systemic'. A contact pesticide will kill whatever it comes into contact with. A systemic pesticide is transported throughout the plant or animal after application.

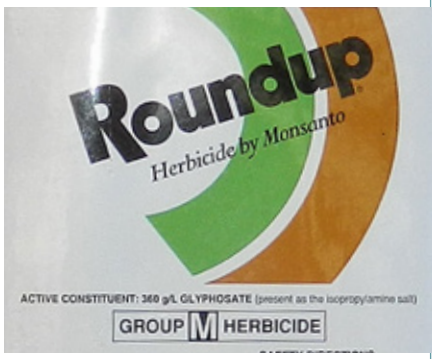
There are three main types of chemicals that you might use to manage pests in your horticulture or CLM work. On the label of the pesticide there is a code to tell you what kind it is. This code is called the 'mode of action symbol'.

The middle letter and/or number is called the 'resistance group code'. This will change depending on the active constituents. We'll talk more about the importance of resistance groups in *Section 2.1*.

INSECTICIDES

Insecticides are substances that are used to kill pest insects. They can be used to kill the adults, larvae or eggs of the insect. Different types of insecticide are:

- Specific: targets one pest species
- Narrow spectrum: targets a limited number of pest species
- Broad spectrum: targets a wide range of pest species



HERBICIDES

Herbicides are sometimes called weedkillers. They are substances used to kill weeds and other plants that are a pest. Different types of herbicide are:

- Selective: targets a particular plant or type of plant and leave the plants that you want
- Non-selective: kills any plants that they come into contact with
- Pre-emergent: is sprayed on the soil and becomes active when there is enough moisture and the weed seeds begin to germinate; the seedlings absorb the chemical and die

FUNGICIDES

Fungicides are pesticides used to kill or inhibit fungi and their spores. They can be used to treat plants or animals suffering from fungal infections.

PRACTICAL ACTIVITY

Read the labels on the chemicals in your workplace and identify the different types that you use. Talk with your supervisor about the kind of pest each one targets. Write these here.

		TICK ☑		
PRODUCT	TARGET	INSECTICIDE	HERBICIDE	FUNGICIDE

1.3 HAZARDS TO THE ENVIRONMENT

In a healthy environment, there is a balance between all plants and animals living in the region. Careless chemical usage can interfere with that balance in a number of ways:

- If chemicals get into waterholes, rivers and aquifers they can damage plants and animals that depend on the water
- Insects, frogs, birds and small mammals may be beneficial to the area as pollinators or by feeding on other pests. If these animals are poisoned, the balance can be destroyed
- If one type of plant is eradicated, another plant species might become a problem
- Off-target damage means that the chemical accidentally affected a plant or animal that you didn't plan to impact. This can happen if:
  - — Spray drift occurs: this is when a chemical is carried in the air
  - — Treated soil moves through wind or water runoff
  - — Rain washes the chemical to other areas
  - — The roots of plants that are close to each other are entwined

The amount of damage caused depends on the type of chemical and its mode of action. Some chemicals can remain active through the food chain and the soil for very long periods of time.

SENSITIVE AREAS

Areas that you really don't want to damage are called sensitive areas, for example, wetlands, animal habitats, culturally important sites, residential areas, creek lines, crops and susceptible plants.

REMEMBER

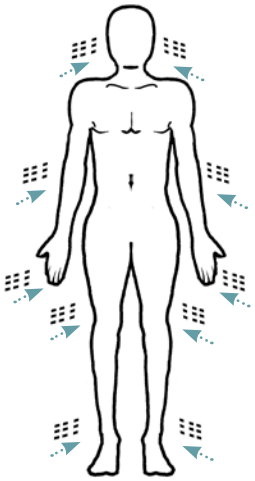
Remind yourself of the difference between hazard and risk by checking the glossary.

1.4 HAZARDS TO PEOPLE

Applying chemicals is hazardous to the person who is using the chemical as well as to people in the surrounding area.

The risk will vary according to a number of factors:

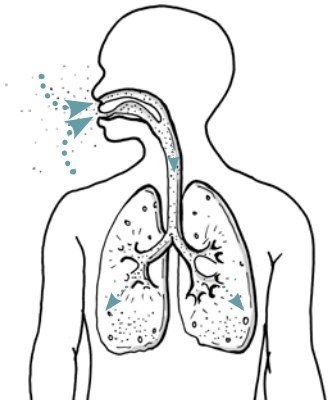
- Sensitivity of the person: a baby or a sick adult will be affected more quickly
- Toxicity of the chemical: how poisonous it is
- Concentration of the mix: how strong it is
- Degree of exposure: how much was touched, swallowed or inhaled



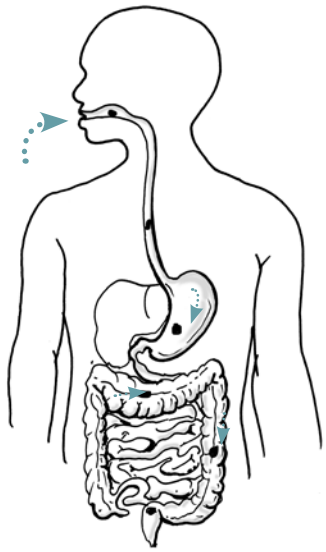
HOW CAN YOU BE POISONED?

Chemicals can enter the body in three different ways.

1. **DERMAL ABSORPTION**: the chemical is splashed or sprayed onto any part of the body. The areas of the body with more sweat glands are more sensitive to absorbing the chemical, but any exposed part presents a danger.



2. **INHALATION**: the chemical is breathed in through the nose or mouth into the lungs. Generally, poisoning that happens by breathing in a chemical is more serious than poisoning by skin contact.



3. **INGESTION:** the chemical gets into the body through the mouth into the stomach. Generally, poisoning that happens by swallowing a chemical is more serious than poisoning by inhalation. However, it is less likely that you would accidentally drink a pesticide than accidentally splash it on your skin or breathe some in.

   Never put chemicals into another bottle, especially not a drink bottle. Many children have been accidentally poisoned in this way.

WHAT HAPPENS IF YOU ARE POISONED?

Exposure to chemicals has been associated with conditions such as:

- Sinus injury
- Skin burns
- Damage to the nervous system, including the brain
- Damage to the digestive tract
- Blindness
- Breathing and lung problems
- Lack of oxygen to the body
- Cancer
- Reproductive problems
- Poisoning causing death

The toxicity of a pesticide can tell you how serious the injury might be and how quickly it might happen. Information about the toxicity of a pesticide is included on the label. Toxicity can be referred to as acute or chronic.

- Acute: single short-term exposure causes injury (within 24 hours)
- Chronic: repeated exposure over time causes injury

A pesticide can have both acute and chronic toxicity. The effects are related to the amount of the pesticide that you are exposed to.

1.5 LEGISLATION

REMEMBER

Legislation is the law. Legislation can contain Acts, Regulations, Codes of Practice and Standards.

Because the hazards to the environment, animals and people are so serious there is a lot of legislation about how to use, transport and store pesticides. There is Commonwealth legislation that applies to the whole of Australia, and there is state legislation that applies to each state.

The laws about registration of pesticides and labelling are Commonwealth legislation (they are the same all over Australia). They are enforced by the Australian Pesticides and Veterinary Medicines Authority (APVMA), a Commonwealth Government department. The legislation they enforce is the *Agricultural and Veterinary Chemicals Code Act 1994* (Agvet Code Act).

Each state and territory also has its own laws about licences, record keeping, following label instructions, using registered pesticides, and other aspects of using pesticides. The main idea of all these laws is to stop people from using pesticides in a way that causes injury to a person, property or non-target plants or animals.

It is not only the Act and Regulations from the legislation that are important. The other aspects of legislation, such as Codes of Practice and Standards, should also be followed.

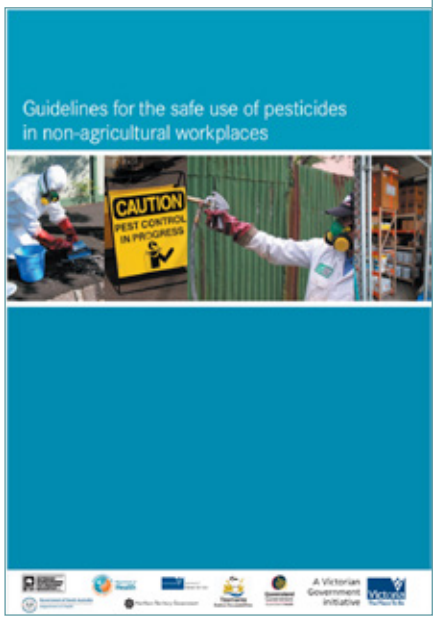
CODES OF PRACTICE

A Code of Practice is part of the legislation, but it is not mandatory. It is a document that helps explain the Act and Regulations. It is often written in less complicated language. It gives practical advice about:

- Safe and effective ways to do a job
- How to comply with the Act and Regulations it supports

If you are investigated for breaches of the Act or Regulations and you weren't following the Code of Practice, this will support the case against you. So it is best to follow it unless there is another solution that achieves the same or a better result.

If you would like to see an example, look for *Model Code of Practice – Managing Risks of Hazardous Chemicals in the Workplace.*



INDUSTRY GUIDELINES

Industry guidelines are written by industry bodies and government agencies to help workplaces comply with the legislation. They are not part of the legislation so are not mandatory. They are good to follow, as they are written by people who know about both the work involved and the relevant legislation.

If you would like to see an example, look for *Guidelines for the Safe Use of Pesticides in Non-Agricultural Workplaces.*

AUSTRALIAN STANDARDS

Standards provide technical guidance for people working in specific industries. For example, there are standards for the building industry and different standards for the pest management industry. Standards are legally enforceable when they are incorporated into legislation. For use of pesticides this is done at the state level.

If you would like to see an example, look for *Australian Standard Termite Management AS3660.1-2000* and *AS3660.2-2000*.

WHS LEGISLATION

Workplace Health and Safety Legislation tells you that as an employee, you have a 'duty of care'. This means you must look after your own safety and that of others. When using chemicals you must:

- Wear the appropriate PPE
- Do the necessary training
- Follow instructions for mixing and applying chemicals
- Tell your supervisor about anything that could make the workplace unsafe for you or anyone else
- Report any injury related to your work

JURISDICTION	LEGISLATION
Commonwealth	*Work Health and Safety Act 2011*
ACT	*Work Health and Safety Act 2011*
New South Wales	*Work Health and Safety Act 2011*
Northern Territory	*Work Health and Safety (National Uniform Legislation) Act*
Queensland	*Work Health and Safety Act 2011*
South Australia	*Work Health and Safety Act 2012 (SA)*
Tasmania	*Work Health and Safety Act 2012*
Victoria	*Occupational Health and Safety Act 2004*
Western Australia	*Occupational Safety and Health Act 1984*

STATE LEGISLATION ABOUT PESTICIDES

An overview of the legislation for each state is listed in the *Resources* section of this guide. This compilation of legislation is intended as a guide only. It is not exhaustive, and expert advice should be sought from the appropriate department in your particular state.

R1

See legislation by State list *Resource R1*, pages 55–58


DANGER
CHEMICAL
STORAGE AREA
UNAUTHORISED PERSONNEL
KEEP OUT
DANGER
WEAR FACE SHIELD
AND RUBBER GLOVES
WHEN HANDLING CHEMICALS
HANDS MUST BE
WASHED BEFORE
RETURNING TO WORK
NO
SMOKING
FLAMMABLE
LIQUID
3

RESEARCH ACTIVITY

Refer to the *Resources* section for this activity. Go to the websites for your state and find the relevant pages about pesticide use.

Answer the questions below.

R1 R2

See *Resources R1* and *R2*, pages 55–58

1. If you need to get a licence, what do you need to do?

2. If there are guidelines or Codes of Practice for your state, then read through them as a group and discuss the documents relevant to your workplace.

   If there are no guidelines or Codes of Practice for your state, then refer to *Model Code of Practice – Managing Risks of Hazardous Chemicals in the Workplace* from www.safeworkaustralia.gov.au.

   Make notes here about the main things you need to do to meet the requirements of the Code or guidelines.

2 GETTING READY

Your supervisor will develop a spray plan based on the problem identified. They will have chosen the pesticide that you will use while thinking about all of the information from the previous section. They will have made sure that this particular chemical is okay to use on the particular pest you are targeting in your state.

Before you can start using the chemical you need to learn how to do it effectively and safely. To find out about this you need to read the label and the Safety Data Sheet (SDS).

IMPORTANT

If you find it hard to read the label, you must ask someone to read and explain the information to you before you use the chemical.

2.1 READ THE LABEL

There is a lot of information that manufacturers of pesticides must include on the label of the products they sell. This is in the Commonwealth Agvet legislation. The layout of the information will change from product to product. Often a lot of the information is put in a booklet attached as a label to the product. The law says it is important to read and understand all of the information on the label.

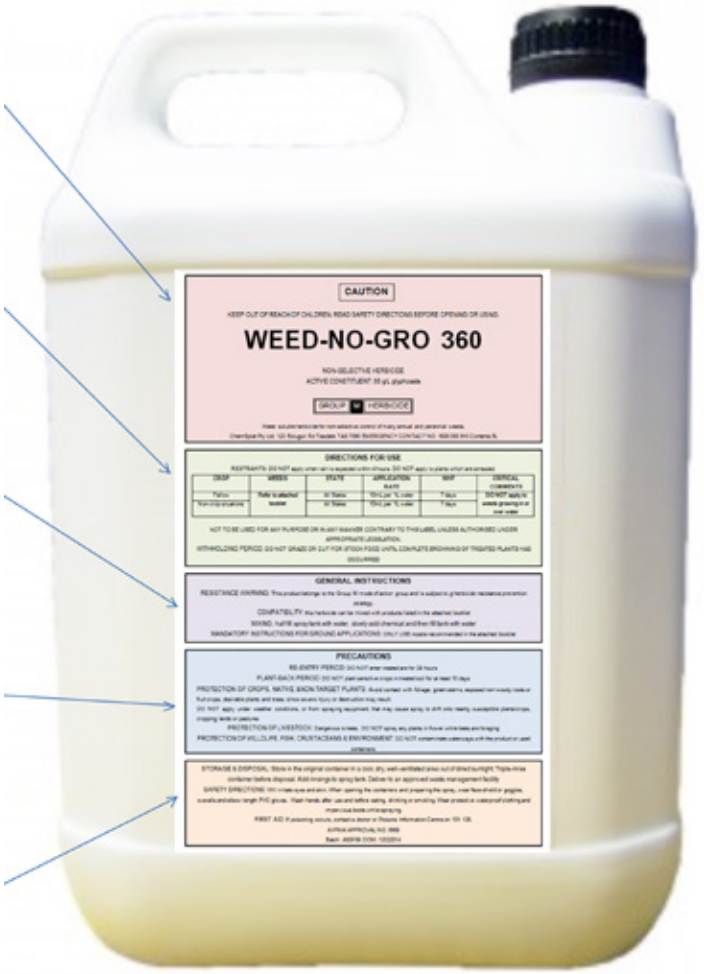
Warnings and product description

Directions and use

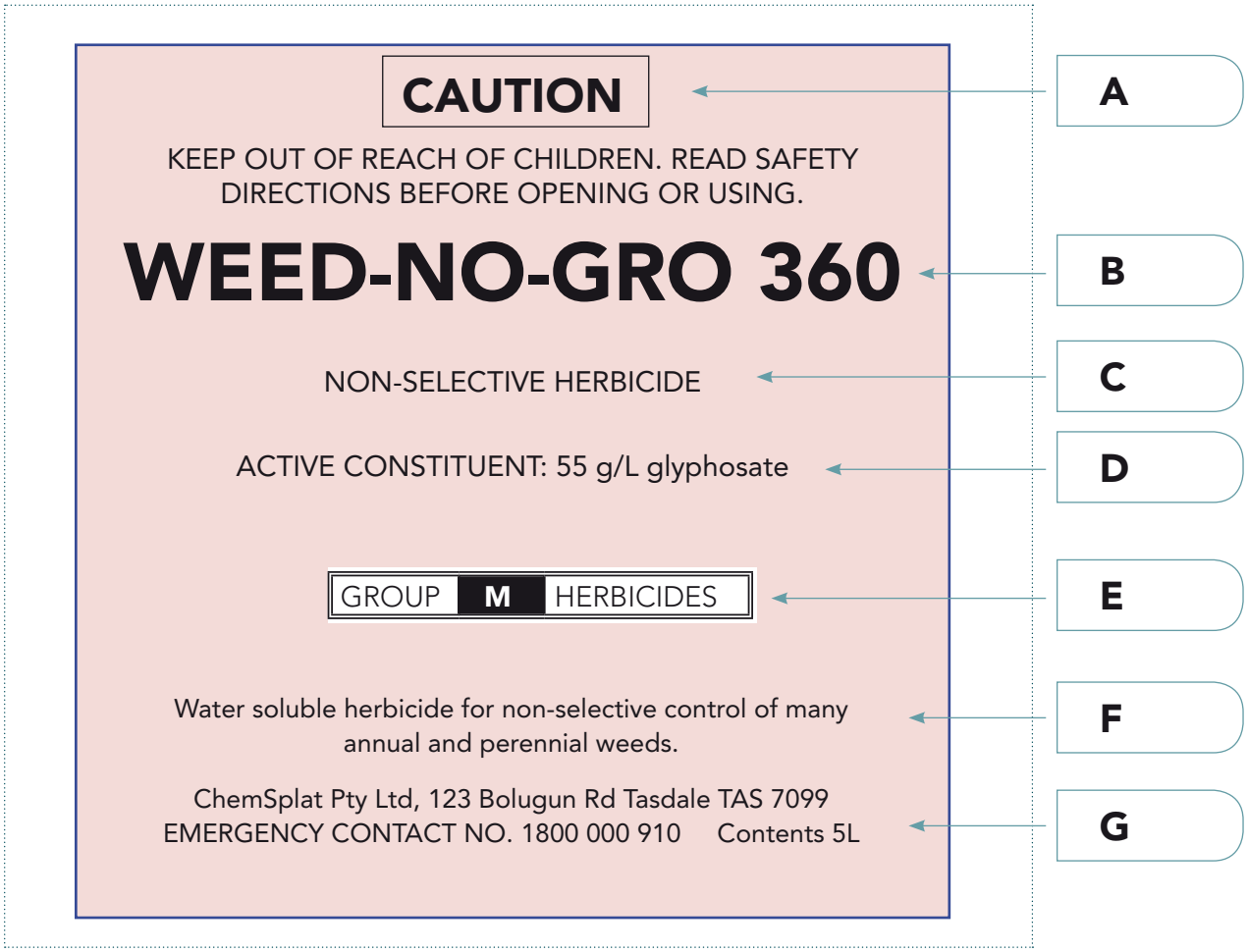
General instructions

Precautions

First aid, storage and disposal



WARNING & PRODUCT DESCRIPTION



A **The signal heading** tells you how poisonous the chemical is. It relates to the chemical's toxicity. The words tell you which poison schedule the chemical belongs to. This can give you information about the sort of PPE you should use. There will be one of three signal headings:

CAUTION means the chemical is moderately hazardous. For example, it may cause irritation to the skin and eyes.

POISON means the chemical is very hazardous. It can cause poisoning.

DANGEROUS POISON means the chemical is extremely hazardous. Just a small amount can cause poisoning or even death.

If there is no signal heading then the chemical is 'unscheduled'. This means that it is relatively safe to use, but safety precautions should still be followed.

B **The registered name of the product**

C **The type of chemical.** This was discussed in *Section 1.2.*

D The **active constituent** is the actual ingredients of the chemical that does the work to kill the weed, insect or other pest. The concentration of the active constituent is also given. If the product contains a poisonous solvent this will be listed separately under this section.

E **Resistance group.** Pests can build up resistance to similar kinds of chemicals. These chemicals fit into groups. To stop the pest from building up resistance to a chemical group, you should not use chemicals from the same resistance group over and over. The management of pests in a specific region will be more effective in the long term if you swap between chemicals from different groups.

F **Broad claims of product** – what the chemical will do.

G **Name, address and phone number of the chemical manufacturer**

DIRECTIONS FOR USE

DIRECTIONS FOR USE

RESTRAINTS: DO NOT apply when rain is expected within 4 hours.
DO NOT apply to plants that are stressed.

A

CROP/ SITUATION	WEEDS	STATE	APPLICATION RATE	WHP	CRITICAL COMMENTS
Fallow	Refer to attached booklet	All states	10mL per 1L water	7 days	DO NOT apply to weeds growing in or over water
Non-crop situations		All states	10mL per 1L water	7 days	

B

NOT TO BE USED FOR ANY PURPOSE OR IN ANY MANNER CONTRARY TO THIS LABEL UNLESS AUTHORISED UNDER APPROPRIATE LEGISLATION.

C

WITHHOLDING PERIOD: DO NOT GRAZE OR CUT FOR STOCK FOOD UNTIL COMPLETE BROWNING OF TREATED PLANTS HAS OCCURRED.

D

A **Restraints** tell you the situations where the chemical MUST NOT be used. This could be because it will be dangerous in that situation, or because it will not be effective.

This is where information to prevent spray drift will be listed. Spray drift will be explained in more detail in *Section 2.7*. The kind of instructions given can be:

- Droplet size
- Wind speed when spraying
- Record keeping
- Downwind no-spray zones (if places downwind are too sensitive to pesticides, e.g. a wetland, another crop, a residential area)
- Surface inversion conditions (this is when warm air and cool air cause wind movement that can carry spray drift for many kilometres)

B **The directions for use table** provides information about how to use the chemical to target pests in specific situations.

CROP/ SITUATION	WEEDS	STATE	APPLICATION RATE	WHP	CRITICAL COMMENTS
The crops and situation that the chemical is designed to be used on	The target pest	The states in Australia where the chemical can be used	The amount of concentrated chemical to mix with water/diesel	Withholding period for each crop	Any important information about application for each crop/situation

C **Not to be used for any purpose** – additional warning statement.

D **Withholding period (WHP)** is the amount of time between when you apply the chemical and when you can harvest the crop. You MUST NOT harvest within this timeframe. This statement can also talk about when it is safe to allow cattle to graze or to cut the crop for stock feed. This period is worked out to ensure safety and effectiveness.

GENERAL INSTRUCTIONS

GENERAL INSTRUCTIONS

RESISTANCE WARNING: This product belongs to the Group M mode of action group and is subject to a herbicide resistance prevention strategy. — **A**

COMPATIBILITY: This herbicide can be mixed with products listed in the attached booklet. — **B**

MIXING: Half fill spray tank with water, slowly add chemical and then fill tank with water. — **C**

MANDATORY INSTRUCTIONS FOR GROUND APPLICATIONS: ONLY USE nozzle recommended in the attached booklet. — **D**

A **Resistance warning** advice must be followed so that the pests do not become resistant to a specific group of pesticides.

B **Compatibility** tells you if it is okay to mix this chemical with other chemicals. DO NOT mix chemicals that are not compatible. This can stop the chemical from working or can be dangerous.

C **Mixing instructions** must be followed for safe use of the chemical.

D APVMA compliance instructions for mandatory droplet size categories will be given for any product that has mandatory instructions. By law, you must follow the information here.

DISCUSSION ACTIVITY

The remaining two sections of the product label are quite self-explanatory. Read through these sections with your group and discuss any terms you are not sure of.

PRECAUTIONS

RE-ENTRY PERIOD: DO NOT enter treated area for 24 hours.

PLANT-BACK PERIOD: DO NOT plant sensitive crops in treated soil for at least 10 days.

PROTECTION OF CROPS, NATIVE & NON-TARGET PLANTS: Avoid contact with foliage, green stems, exposed non-woody roots or fruit crops, desirable plants and trees, since severe injury or destruction may result.

DO NOT apply under weather conditions, or with spraying equipment, that may cause spray to drift onto nearby susceptible plants/crops, cropping lands or pastures.

PROTECTION OF LIVESTOCK: Dangerous to bees. **DO NOT** spray any plants in flower while bees are foraging.

PROTECTION OF WILDLIFE, FISH, CRUSTACEANS & ENVIRONMENT: DO NOT contaminate waterways with the product or used containers.

STORAGE AND FIRST AID

STORAGE & DISPOSAL: Store in the original container in a cool, dry, well-ventilated area out of direct sunlight. Triple-rinse container before disposal. Add rinsate to spray tank. Deliver to an approved waste management facility.

SAFETY DIRECTIONS: Will irritate eyes and skin. When opening the containers and preparing the spray, wear face shield or goggles, overalls and elbow-length PVC gloves. Wash hands after use and before eating, drinking or smoking. Wear protective waterproof clothing and impervious boots while spraying.

FIRST AID: If poisoning occurs, contact a doctor or the Poisons Information Centre on 131 126.

APVMA APPROVAL NO. 9999 Batch: A93F56 DOM: 12022014


ROUNDUP 360 5L
NOT TO BE TAKEN
CAUTION
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING OR USING
Roundup
Herbicide by Monsanto
GROUP M HERBICIDE
Contents:
5 Litres
Yates
CAUTION
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS
ZERO
WEEDKILLER
490g/L
SUPER CONCENTRATE
MAKES UP TO 250L OF SPRAY
KILLS WEEDS AND GRASSES, ROOTS AND ALL
Glyphosate Weedkiller
NON SELECTIVE
NON RESIDUAL
1L
COPPER OXYCHLORIDE
POISON
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS
Amgrow
DISEASE CONTROL
COPPER OXYCHLORIDE
FUNGICIDE
For the control of certain fungal diseases of fruit trees, vegetables and ornamentals in the home garden.
Net Contents 200g

PRACTICAL ACTIVITY

Look at the labels of the chemicals you have in your workplace. Remember that all labels will present the information differently, so they won't all look the same.

Fill in the page below with the required information from one of the pesticides.

CHEMICAL

Registered name

.....

Signal heading

.....

Are there any restraints? If yes, write one restraint.

.....

What precautions does the label recommend you take to protect the environment?

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.....

.....

.....

PRACTICAL ACTIVITY

For each of the pesticides in your workplace that you listed in *Section 1.2,* read the storage instructions on the label. Does your workplace store all chemicals in the way it should?

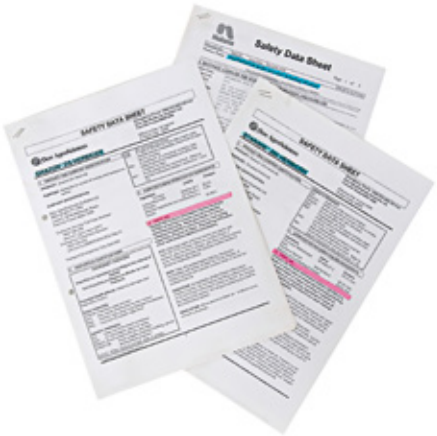
Work as a group to suggest more appropriate ways of storage if the label requirements are not being met.

2.2 READ THE SAFETY DATA SHEET

A Safety Data Sheet (SDS) used to be called a Material Safety Data Sheet (MSDS). It is a document that gives information about a particular chemical. It has information about how the chemical can affect health and safety in the workplace. It also contains important technical information and describes things you must do to make sure you do not damage the environment.

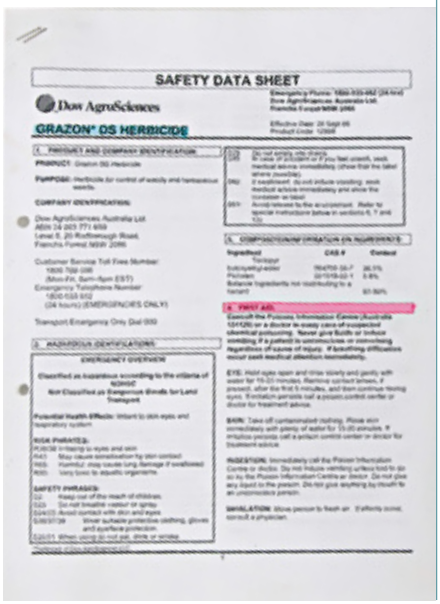
The SDS provides some of the same information as on the label of the chemical and some different information. It is important that you read and understand both the label and the SDS. The information is important to use when doing the job safety analysis (you'll do this in *Section 2.8*).

The SDS is written by the manufacturer. All chemical pesticides will have an SDS that the reseller must give you. The SDS is also available from the manufacturer's website.



An SDS must provide particular information in a particular format. The main sections that are relevant to your work while under supervision are:

- **FIRST AID**: detailed information about what to do in the event of an accident
- **HANDLING & STORAGE**: information about how to handle and store chemicals safely
- **ACCIDENTAL RELEASE MEASURES**: this is about how to clean up spills
- **EXPOSURE CONTROLS/PERSONAL PROTECTION**: this section includes information about the PPE required



- **TOXICITY INFORMATION**: information about what can happen if someone is poisoned and the acute and chronic effects
- **ECOLOGICAL INFORMATION**: potential environmental damage and ways to avoid this
- **DISPOSAL CONSIDERATIONS**: may refer to the Regulations, so you will need to be familiar with these
- **REGULATORY INFORMATION**: information to help you find the appropriate Regulations that you need to comply with when working with this product

DISCUSSION ACTIVITY

Locate the SDSs for the chemicals you have in your workplace. Work in pairs or small groups and read through the SDS for the chemical you looked at in the previous activity.

What information is on both the label and the SDS?

.....

.....

Describe how the product should look – its appearance (colour, etc.).

.....

.....

What should you do if a person swallows the product?

.....

.....

What first aid equipment do you need to have in your workplace when you are using this product? Please note: If you are working remotely, away from base, you should have this equipment in your vehicle.

.....

.....

.....

2.3 PERSONAL PROTECTIVE EQUIPMENT

The SDS tells you the Personal Protective Equipment (PPE) that you need to use while applying and cleaning up a particular product. Here is a guide to the sort of PPE you might need for a range of chemicals. Always follow SDS recommendations.

PPE USED IN CLEANING WORK

Long-sleeved cotton shirt buttoned to the wrist and throat		Face shield	
Long cotton trousers		Half-face respirator	
Waterproof overalls		Goggles and safety glasses	
Waterproof boots		Elbow-length PVC gloves	
PVC apron		Lightweight nitrile gloves and P2/P3 masks	

LOOKING AFTER PPE

Follow the instructions on the packet for cleaning and storing PPE. In general it is good to:

- Wash all PPE with warm soapy water and dry it after use – clothes, gloves, boots, goggles, etc.
- Respirator filters can be stored in plastic bags
- Store PPE separately from the chemicals
- Store used PPE separately from new equipment
- Store in a dry and dust-free area
- A plastic tub with a lid is a good option if your workplace is a bit dusty

PRACTICAL ACTIVITY

Check the PPE that you have available in your workplace.

It is important that you can tick all of these items. If you can't then you need to speak with your supervisor about how to fix the situation before you can apply any chemicals.

	☑
I have what I need for the job	
It is clean	
It is dry	
It is in good condition (no tears, holes, breaks, etc.)	

Hand-held pressure sprayer

Knapsack sprayer

Tank mounted on a quad

Tank mounted on a trayback or trailer

IMPORTANT

With any of this equipment it is important to do a pre-start check

2.4 EQUIPMENT

The equipment you need to do the job will depend on the technique you will use. The technique depends on the type of pest you are treating and where it is. We'll discuss techniques in more detail in *Section 3.1*.

SPRAY EQUIPMENT

There are a range of tools to spray pesticides. The most commonly used in small-scale horticulture and CLM are pictured on the left.

PRE-START CHECK FOR SPRAY EQUIPMENT
(see *Resources* section for full page photocopy sheet) ☑

• Pumping/pressure system works properly	
• Pressure gauges work	
• Filters are clean	
• Tank is clean and dry with no residue	
• Tank has no leaks – check by looking	
• Hoses and clamps have no leaks – check by looking	
• Wands and hand pieces work properly	
• Nozzles are the right type for the job	
• Nozzles are not blocked	
• Tank capacity (how many litres it holds)	

ADDITIONAL PRE-START CHECK FOR MOTORISED SPRAY EQUIPMENT ☑

• General condition of engine – check by looking	
• Pump has no leaks	
• Fuel	
• Engine oil	
• Air filter	
• Condition of starting rope	
• Battery – if electric start	
• Mounting is secure	

PRACTICAL ACTIVITY

Carry out a pre-start check on the equipment in your workplace using the list(s) opposite.

If there is a problem with any item, you need to speak with your supervisor about how to fix it before you can use the equipment. Equipment that does not get a tick for every item cannot be used. You might need to buy new equipment if it can't be repaired.

R3

For a pre-start checklist template see *Resource R3,* page 59

ADJUST SPRAY EQUIPMENT

You need to ensure that you have even coverage over the spray area. If your equipment is not spraying evenly, then your nozzle might be partially blocked or damaged. If this is the case you need to replace or clean your nozzle.

You need to ensure adequate coverage of spray over the plant foliage. When using hand-held equipment you should spray until run-off. This means to spray until the herbicide just begins to drip off the surface of the plant leaves or stem.

For even and adequate coverage, you need to maintain constant pressure with a suitable nozzle.

With boom or low volume equipment, you need to follow the recommended rates, pressures and nozzle selection.

PRACTICAL ACTIVITY

Have a go at using the equipment in your workplace with water. Look at the spray pattern of the nozzle and the quantity coming out.

For hand-held equipment, you can vary the pressure by pumping more. Notice what happens as the pressure drops.

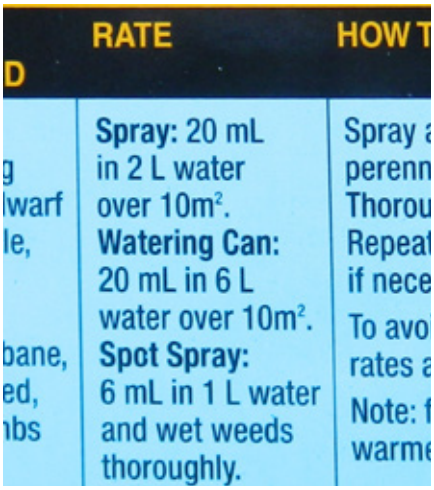
Your aim is to have an even and adequate coverage.

MIXING EQUIPMENT

The label of the chemical gives instructions for mixing. When you are getting ready make sure that you have everything you will need. This is very important if you will be mixing away from your base station.

Mixing equipment you will need:

- PPE
- Measuring containers
- Clean water for mixing



SPILL KIT

The SDS gives you information about how to manage a spill. If you spill some of the chemical you will need to soak it up. You need to have your spill kit ready before you touch the chemical. Spills are most likely to happen when you are mixing. This is also the most hazardous stage, because you are working with the chemical in a concentrated form.

Your kit should have these items:

- Absorbent pads
- PPE – goggles, gloves and respirator
- Waste bag
- Safety and disposal procedures

REMEMBER

If you spill some of the chemical you need to soak it up. A spill kit has the things you will need.

MARKER DYES

A coloured dye can be mixed with the chemical when it is diluted. Dye will help you:

- See the plants or area that has been treated
- See if you have sprayed off-target so you can correct your aim
- Avoid overusing and/or wasting chemicals

Dye will stop you from:

- Using too much chemical, which can save money
- Missing targeted areas, which could decrease effectiveness
- Damaging the environment caused by over-spraying or off-target damage

HAND TOOLS

It is important to have the right tools for the job. The tools you might need are below; which one/s you use will depend on the weed and technique.

Saws	
Loppers	
Hand or power drill	
Machete, axe or chisel and mallet	
Tongs and weedbrush	
Hand-held spreader for granules	

2.5 TRANSPORTING CHEMICALS

You probably found some information about transporting chemicals when you looked at the legislation and guidelines. You might also have found some on the label and/or SDS for the products you looked at. It is important to think about the hazards and how you will transport the chemical before you begin loading it in your vehicle. Any scheduled substances will have regulatory requirements to ensure they are transported safely.

DISCUSSION ACTIVITY

You have learnt about how hazardous pesticides can damage the environment, animals and people. Discuss in your group what could go wrong when you are driving a vehicle with containers of chemicals.

Make a list of the things you can do to reduce the risk of an accident happening.

Compare your ideas from the previous activity with these general guidelines for safe transport of chemicals:

- Make sure that containers are tied down securely. They must not be able to move around. If you are travelling on a corrugated road, make sure that friction will not cause damage to the container
- Do not pack chemicals where they could come into contact with food for humans or animals
- Make sure there are no sharp objects in with the containers. These could cause a puncture
- Make sure there are no leaks and that lids are secured
- Do not put chemicals in the boot or back of a troopy. If there are fumes or a spill, it can affect the people in the car. It is best to carry them in a trayback or trailer
- Put a tarpaulin over chemicals that are not in weatherproof packaging
- Wood will soak up the chemical if spilt. If the vehicle has a wooden tray, use a plastic liner or put the containers in plastic tubs
- Do not leave the vehicle unattended if there is easy access to the chemicals
- Make sure you have all PPE and a spill kit in case of an emergency
- If you have any concerns, speak with your supervisor and work together to find a solution. If necessary, postpone the job until you can be sure it is safe to proceed

2.6 THE WEATHER

It is important to consider the weather during the planning stage of your application process. The weather can impact the safety and effectiveness of the job.

SAFETY

The weather affects road conditions and safe access to some areas. Make sure the road you are travelling on will be safe.

If it is too hot, then the operator might become fatigued. If you need to spray during the hot time of year, make sure you plan your activity early in the morning when it is cooler. Also, carry plenty of water.

EFFECTS OF WEATHER

WIND

When you are using pesticide, it can be picked up and carried by the wind. This can happen with spray and fine granular pesticides.

When you are spraying, it is good if there is slight air movement as it helps the droplets move around the plant and settle on more of the surface of the targeted pest.

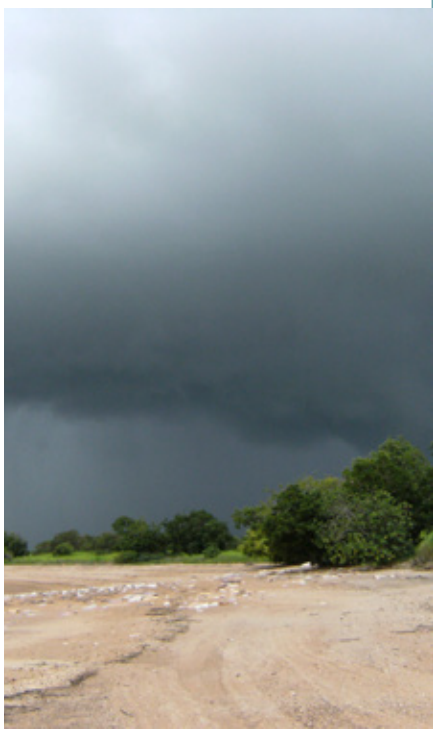
Source: www.bom.gov.au

If the wind is too strong, it can blow the chemical away and possibly land on plants that you don't want to poison. This is called off-target damage. When the wind picks up droplets and carries them to another location, it is called spray drift. Spray drift can cause off-target damage. It is important to minimise the risk of spray drift.

It is also important that you know how strong the wind is and the direction it is blowing. If it is very windy, or if the wind is blowing in the direction of a sensitive area, you should not spray. Check with your supervisor if you are unsure. You need to know the direction of sensitive areas from where you are spraying.

TEMPERATURE & HUMIDITY

If the weather is very hot and dry, then the fine spray can evaporate before it lands on the target. If you are spraying at a time of year when these weather conditions are unavoidable, it is best to work in the early morning when it is cooler. Also, plants might not be actively growing if the weather has been hot and dry for some time. Humid weather is a good time to spray.



RAIN

Rain can seriously interfere with the effectiveness and the safety of chemical application. This is why it is very important to read and follow the information on the label about rainfall and soil moisture conditions. The word 'rainfast' is often used to give the amount of time the chemical needs before it can be rained on. You will find this on the constraints section of the label.

There are a number of problems that can be caused by rain.

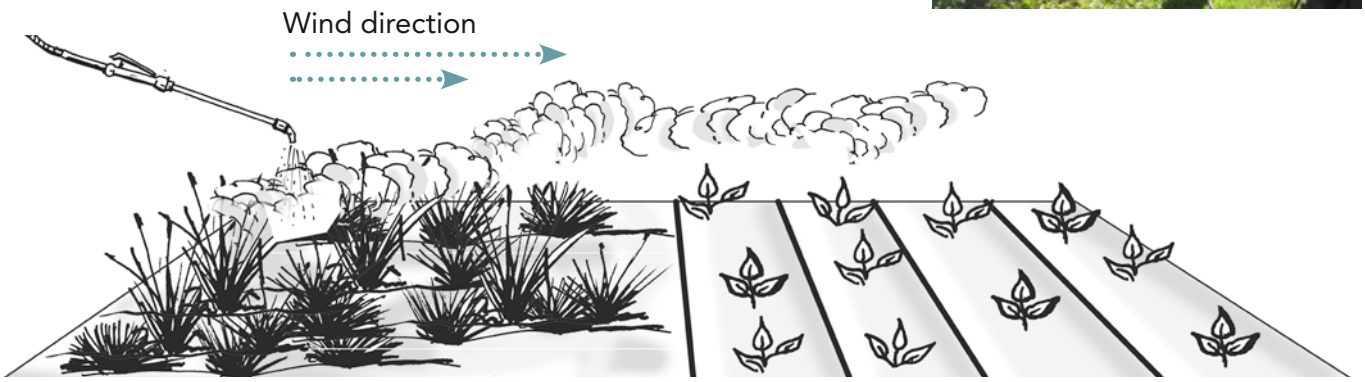
- If the chemical is washed off the plant foliage into the soil and it isn't active in soil, then it won't kill the weed
- If the chemical is washed off the plant foliage and it is active in soil, then it can cause off-target damage
- If the chemical is applied to the soil, excessive rain can dilute the chemical so that it loses its effectiveness
- If the chemical is applied to the soil, excessive rain can cause the chemical to be washed away with soil and cause off-target damage.

DISCUSSION ACTIVITY

What are the best sources of information about weather conditions where you work?

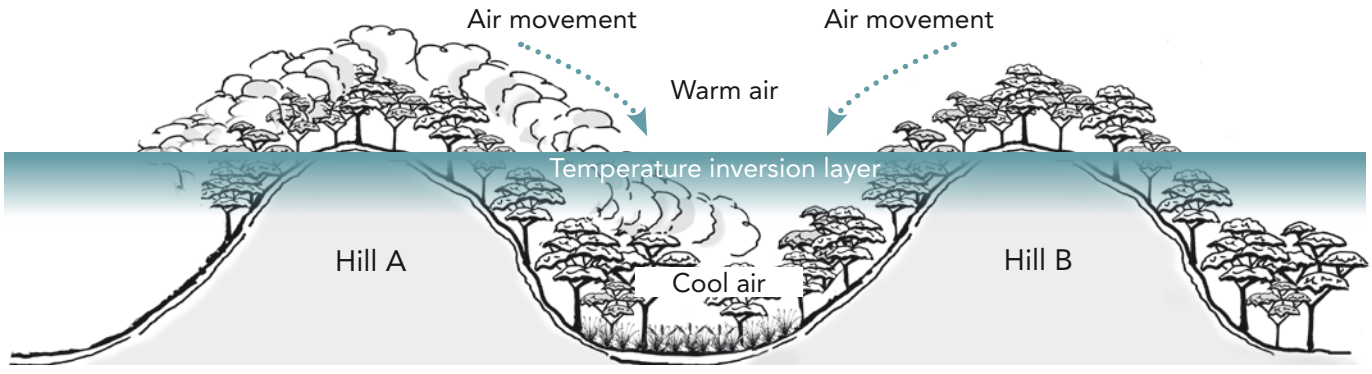
2.7 SPRAY DRIFT

You might remember from reading the label and the SDS that there was a lot of information about how to avoid spray drift. This can be a big problem with larger scale application. Spray drift happens when the pesticide blows away from where it should go and lands on another area. This can be a serious issue, depending on the chemical and the final destination. Spray drift poses a risk to people, animals and the environment. Imagine if herbicide landed on a sensitive regeneration site or a pesticide ended up in a children's playground.



On a spray gun, the nozzle size controls how large the droplets of pesticide are that come out of the gun. The larger the droplet, the less chance of spray drift. This is because fine spray with smaller droplets is more easily taken into the atmosphere.

Spray drift can also happen because of the topography of the area where you are spraying. Very simply put, hills and valleys can create their own microclimate. An inversion layer creates air currents because of different temperatures above and below the layer. These air currents can lift spray into the atmosphere and release it in another location. For example, if you were spraying on top of 'Hill A' spray drift might travel and land on the valley floor. This can occur without any wind being registered for the region.



DISCUSSION ACTIVITY

How can you find out about the topography of where you work to avoid potential problems with spray drift?

2.8 WORKPLACE DOCUMENTS

A Standard Operating Procedure (SOP) or Safe Work Method Statement (SWMS) is a workplace document that describes the procedure for doing a particular task safely.

A Job Safety Analysis (JSA) is a workplace document that you fill out every time before you do a job. It forces you and your team to:

- Consider all of the hazards that might be present at that time
- Assess the risks involved in doing the job
- Find ways to reduce the risks to an acceptable level

Everything we have discussed so far has prepared you to participate in filling out the JSA effectively before you begin the job outlined in the spray plan. You have already done most of the thinking to ensure that you set off safely with the right equipment and PPE.

PRACTICAL ACTIVITY

Find your workplace SOPs relating to spraying weeds. Read through them and discuss them with your group.

If you don't have any, ask your supervisor or trainer to help find a sample one from the internet. Read through it and discuss it with your group. Make any changes required to suit your workplace. You can keep this SOP for future jobs.

PRACTICAL ACTIVITY

Work with your supervisor or trainer to complete a JSA for a weed management job that you will be doing at your workplace using your workplace template. If you don't have one, you can use the template opposite.

JOB SAFETY ANALYSIS

Organisation		
Job	Location	
Procedure developed by	Approved by	Date

Tick the box for the PPE required.

Task Steps in the job	**Hazards Identified** What could cause injury?	**Risk Score**	**Controls** What can be done to minimise the risk of injury?	**Final Risk Score**

3 APPLY CHEMICALS

Now that you have everything planned, you are ready to apply the chemical in the most effective way. Your planning will also make sure that you minimise risks to yourself, other people and the environment.

3.1 APPLICATION METHODS

The application method is the way that you actually get the chemical onto the pest. The best method will depend on what the pest is and where the pest is. You must use the application method recommended on the label of the chemical.

It is always most effective to apply herbicide to actively growing, healthy plants. This is because they will be able to take up the chemical more readily. It is also best if they are not budding, flowering or seeding.

SPREADING DRY PELLETS OR GRANULES

Some chemicals come in a dry form and require spreading over the ground around actively growing plants. This type of chemical is often used to control woody weeds. These can be applied by hand or with a small spreader. Dry chemicals can also be applied by aerial application for large infestation in inaccessible areas. Care must be taken to ensure that off-target damage will not occur as a result of wind or rain wash-off. This method is not suitable to use near wetlands or waterways.

CUT STUMP

This method uses a liquid herbicide on weeds where pulling out is not practical, for example, trees, shrubs and thick vines. It is best when there are not too many weeds to treat, as it takes quite a long time.

The stem is cut as close to the ground as possible using a saw or loppers. The chemical is immediately applied to the surface of the stump using a gel applicator or by spraying. The chemical must be applied within 15 seconds to make sure it is absorbed effectively.

The advantages of this method are:

- You can be very selective about the plants you poison
- There is no disturbance of the soil

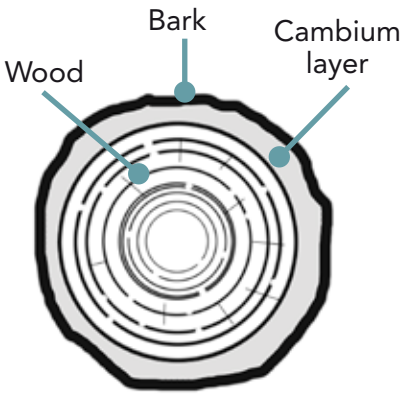
The disadvantage of this method is that if wildlife rely on the weed for nesting and shelter, then their habitat is destroyed immediately. There are methods that leave the weeds in place while they die, so that wildlife have time to finish raising their young before having to relocate. Some of these methods are described on the following page.

BASAL BARK

This method uses liquid herbicide mixed with oil, usually diesel, to treat small trees and shrubs. The mix is applied to the trunk/stem by spraying until run-off. Spray from the ground level up to just under about half a metre. It is important to cover all around the trunk/stem, front and back. If the plant has more than one stem, they must all be treated. This method won't work on trees with thick or burnt bark. It will take several weeks for the plant to die.

STEM INJECTION METHODS

These methods use liquid herbicide to control large woody weeds with a thick bark. They are useful when removal of the plant is difficult or may contribute to erosion. You need to get through the bark and apply the herbicide into the cambium layer of the weed. This is the fleshy part of the stem immediately beneath the bark. Using these methods, it will take several weeks for the plant to die.



DRILL & FILL

Use a drill to make holes in the base of the trunk/stem about 40mm apart. The holes should be on a 45° angle to the trunk and go right through the bark into the cambium layer. Immediately fill the hole with herbicide. The holes should be spaced all around the trunk/stem.

CHIPPING

Chipping is similar to drilling, except that instead of using a drill you use a small axe or chisel and mallet to make chips around the base of the weed to get to the cambium layer. You then fill the gaps with herbicide. The herbicide needs to be applied within 15 seconds.

WIPING

Wiping the chemical onto the foliage of the weed is a good way to treat small weeds that are growing with many other desirable species. The chemical can be wiped onto the plant using a weed wick, paintbrush or tongs and sponge.

NOTE

'Foliage' means all the leaves of a plant. You can figure out then that 'foliar' has something to do with leaves.

FOLIAR SPRAYING

Foliar spraying is used to remove herbaceous weeds by spraying the leaves of the plant. It is also an efficient method when a larger area needs spraying and there are few desirable species. A high level of care must be taken to avoid off-target damage.

BOOM SPRAYERS have multiple nozzles and can be attached to a vehicle or tractor. This means that a large area of land can be covered relatively quickly and easily. These types of sprayers are widely used in large-scale agricultural production.

SPOT SPRAYING is often done with small hand-held equipment, a knapsack or a quad-mounted tank with a hand gun or spray lance. This method is usually best for small or isolated patches or in difficult-to-reach areas. You can be more accurate when you apply spray by hand, so you can minimise off-target damage.

DISCUSSION ACTIVITY

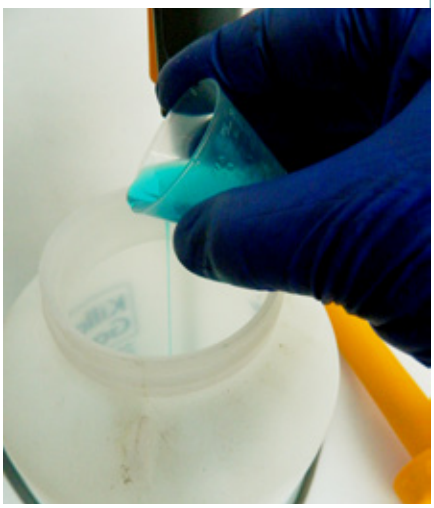
What sort of weeds do you treat in your region?

Where are the weeds?

What sort of methods do you use?

What equipment do you use?

Describe any sensitive areas in the region where you work.



3.2 MEASURE, MIX & LOAD

The spray plan for each particular job you do will have details about the size of the area you will be working on. This is important information to consider before you begin measuring and mixing, because you should only mix the amount of spray that you will need.

MEASURE

You need to measure the chemical and water at the rate given on the label for:

- Your equipment
- The pest you are targeting
- The state where you are applying the pesticide

You also need to know the size of your tank.

Before measuring:

- Make sure your measuring equipment is clean
- You are wearing your full PPE
- You have your spill kit available

There are more hazards if a splash or spill occurs at this stage, as the chemical is concentrated.

PRACTICAL ACTIVITY MEASURING WORKSHEET

1. Rate from chemical label		**millilitres per litre (mL per L)**
2. Size of your tank (volume)		**litres (L)**
3. Multiply the first number from 1 by the amount from 2		**millilitres (mL)**

This last number is the amount of the concentrated chemical that you will need to add to the mix if you are filling your tank. If you are only using half a tank then you need to halve this amount by dividing by 2.

Measure it accurately using the measuring jug, and then follow the mixing instructions.

MIX

Usually the concentrated chemical is mixed with water. Sometimes it is diluted with other liquids, such as diesel. Your supervisor will guide you on the most suitable control method.

Follow the instructions on the label for the correct mixing procedure for each chemical.

The label might say:

> Half fill the tank with water and add the concentrated chemical and marker dye. Then fill the tank with water to the required amount.

Also ensure that you follow the directions about where it is safe to mix the chemical. Generally the best ventilation is outside. Don't mix chemicals in a small shed or chemical storage container.

LOAD

Finally, if you are driving to another location you need to tie the spray tanks and containers onto your vehicle securely.

You have planned how you will travel in *Section 2.5*. Use that information at this stage. Remember also that if you need to mix more chemicals at the spray location you will also need to carry concentrate and additional water, dye and/or diesel with you.

You will also need all your safety equipment, including drinking water, spill kit and SDSs. Your PPE should be stored in a tub to keep it clean if you are travelling on dusty roads.

3.3 MANAGE EMPTY CONTAINERS

If you empty the chemical container while you are measuring, you need to manage the empty container. The label and SDS give instructions about how to do this. Usually you will need to 'triple rinse' or 'pressure clean' the containers. Then you will need to dispose of them as instructed.

TRIPLE-RINSE PROCEDURE – FOR EMPTY CONTAINERS

STEP 1

Drain the container into the spray tank for 30 seconds

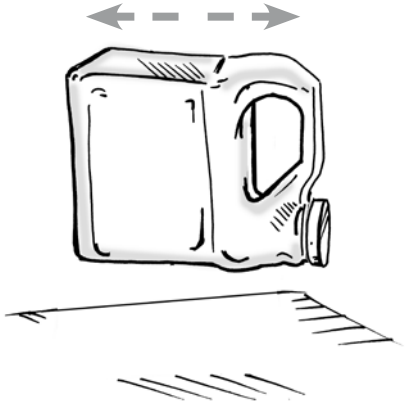
STEP 2

¼ fill the container with clean water and then the put lid on

Repeat these 3 STEPS 3 TIMES to complete the rinse procedure

STEP 3

Shake the container sideways for 30 seconds



NOTE

'Rinsate' is the rinse water that has a very diluted chemical in it.

Rinsate from empty containers should always go into the spray tank.

Never empty rinsate down the drain.

DISPOSE OF CONTAINER

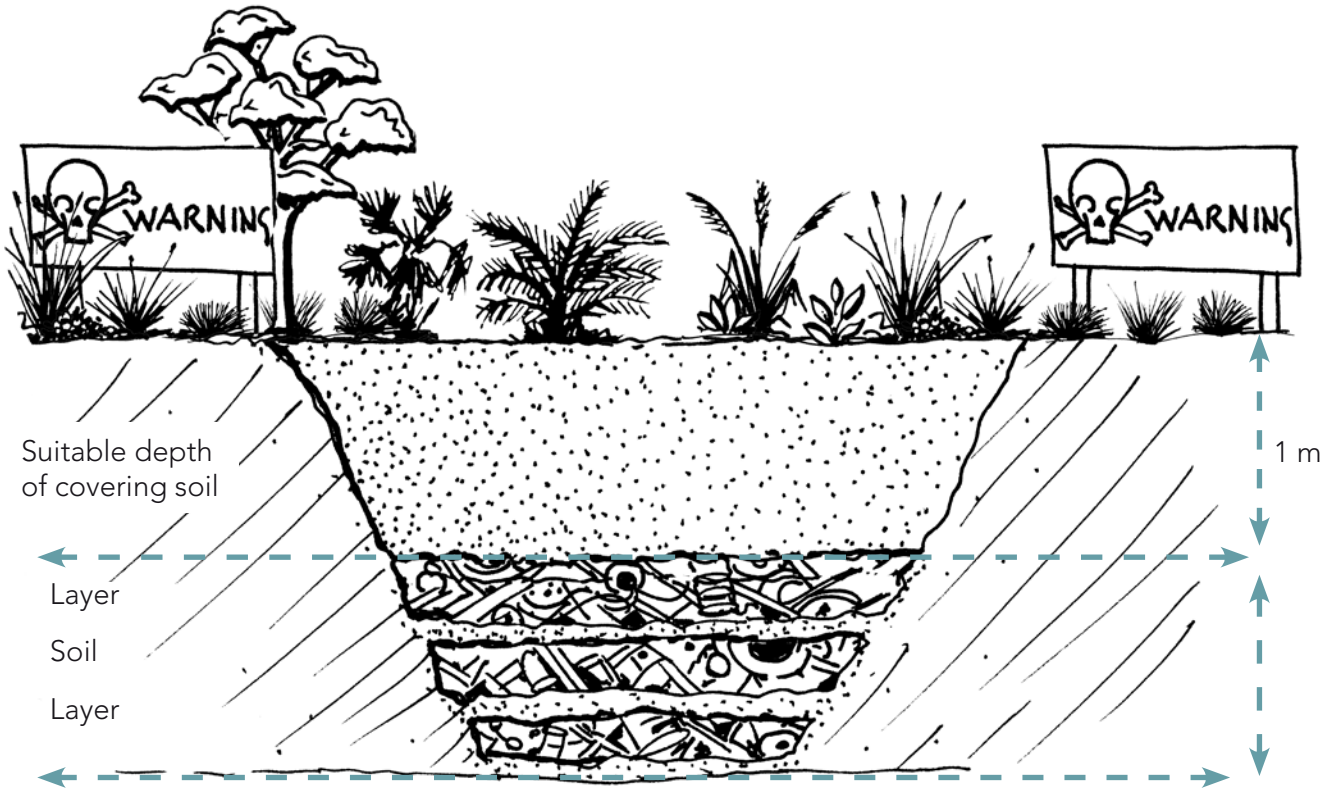
The label and SDS will explain how to dispose of the container. If you are in town, you can often take these to a waste management facility. Some facilities are drumMUSTER collection sites. This means the eligible containers can be recycled.

If you can't get to town, then you need to arrange a place to bury the containers. They should be buried where there will be no risk of contaminating ground water and in keeping with the SDS instructions.

You should check with your local Shire Council or relevant authority to make sure the site you choose is suitable.

NOTE

See if you have a drumMUSTER collection site near you.
www.drummuster.com.au



DISCUSSION ACTIVITY

Look at the labels on the chemicals in your workplace. How should you clean and dispose of each? How can you dispose of empty containers in your region?

3.4 WHILE YOU WORK

Now that you're on site and applying the chemical according to your plan, you need to keep looking out for hazards that could affect:

- You and other people
- The environment
- The effectiveness of the chemical

The kinds of things you might notice are:

1. People or animals entering the area you are spraying
2. The weather conditions, e.g. changes in wind direction, wind speed, chance of rain, temperature
3. Where your spray is landing – keep an eye out for spray drift/ off-target damage
4. Changes in the number of weeds, e.g. if there is less of the weed and more desirable plants
5. Snakes, trip hazards
6. Fatigue

If you notice any of these things, you need to stop and consider appropriate action.

DISCUSSION ACTIVITY

Discuss with your group what you would do if you noticed any of the things described above.

DISCUSSION ACTIVITY

Discuss this as a group.

You are spraying weeds with a pesticide and you notice some people enter the area you have just sprayed. You call out to them but they don't seem to know what you're saying. When you go up to them you realise they don't speak English. How will you let them know that it is dangerous to be in the area?

3.5 CLEANING UP SPILLS

While you were planning the equipment in Section 2.4, we mentioned a spill kit. This is usually a container with items in it that you use if the chemical accidentally spills. The steps to cleaning up a spill are:

1. Wear full PPE
2. Stop any leaks
3. Soak up the spill with absorbent pads, sawdust or sand
4. Shovel into the tub or a strong plastic bag
5. Follow SDS instructions for disposal of waste

DISCUSSION ACTIVITY

Look at the SDSs for some of the chemicals in your workplace. How will you dispose of the waste after a spill in your area?

3.6 EMERGENCIES

Different chemicals need different first aid treatment. This information is given on the SDS. If any ill effects are felt from the pesticide, then you must refer to the SDS and follow the instructions. If you have any doubts you can call the Poisons Information Centre on 13 11 26, or get to a clinic as soon as possible.

When working remotely it is really important to take with you:

- A well-stocked first aid kit
- Plenty of clean water for washing
- The SDSs for the chemicals you are using

All incidents in your workplace should be reported. This is part of the Workplace Health and Safety Regulations in all states and territories in Australia. If you are unsure, speak with your supervisor about the procedure at your workplace.

REMEMBER

Australian Poisons Information Centre
13 11 26

DISCUSSION ACTIVITY

It's October: you and a workmate have been out spraying for about three hours with spray tanks mounted on quad bikes. You turn around and your workmate is lying on the ground next to his spray gun.

What might have happened? Give a range of possible scenarios.

What will you do?

4 FINALISE WORK

When you have finished spraying, there are some things you need to do to finish up properly.

4.1 CLEAN UP

CLEANING SPRAY EQUIPMENT

Use water and the triple-rinse procedure. Make sure there will be no residue when you need to use the equipment again.

TRIPLE-RINSE PROCEDURE

IMPORTANT

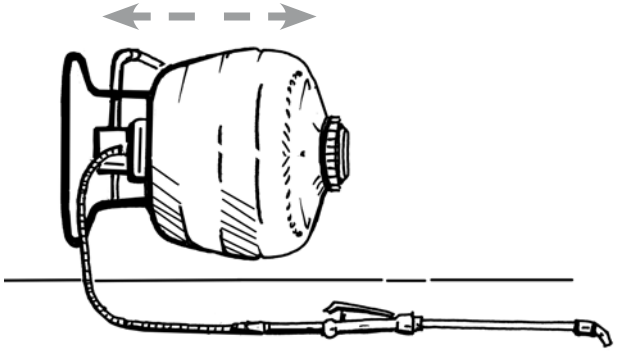
You should never mix more chemical than you need. Spray out all the mixed chemical onto the pest you are treating.

STEP 1

¼ fill empty spray container with clean water and replace lid.

STEP 2

Shake sideways and upside down for 30 seconds.



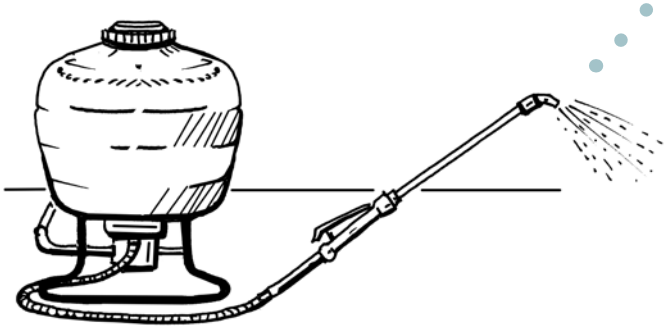
Repeat these 3 STEPS 3 TIMES

NOTE

Rinsate from cleaning your sprayer still has traces of the chemical in it, so it is still hazardous. You need to think about the best place to spray it out. It must not damage anything on anyone else's property. Never spray it into the drain or near a waterway.

STEP 3

Spray rinsate out to clean the nozzle at a suitable location.



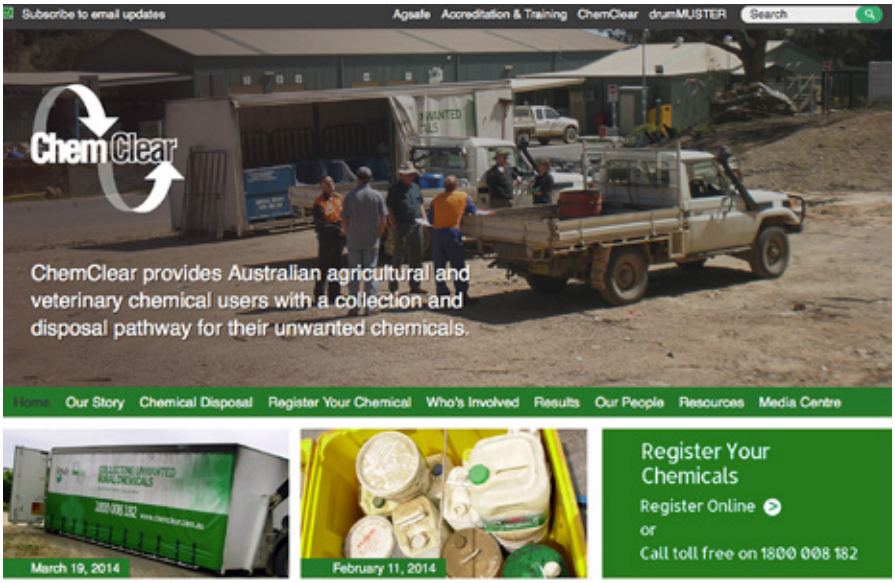
DISCUSSION ACTIVITY

At your workplace, where is the most appropriate place to spray out the rinsate from cleaning your spray equipment?

UNWANTED CHEMICAL CONCENTRATE

Ideally, you will only purchase the amount of chemical you need for a planned project.

If you need to get rid of chemical concentrate that is out of date, then you need to follow the label and SDS instructions. ChemClear is a service located in some parts of Australia that will take unwanted chemicals.

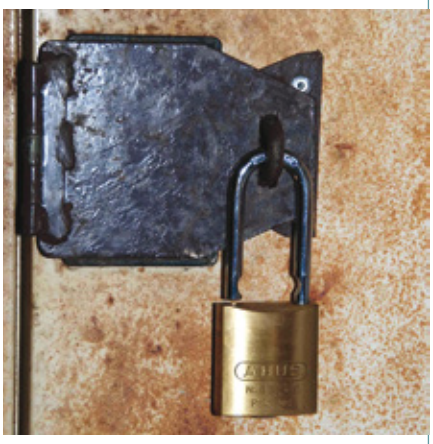


ChemClear

See their website at www.chemclear.com.au

IMPORTANT

Always leave chemicals in their original containers. Never decant into other bottles or containers.



4.2 STORAGE

When you have finished using the chemical you need to put it away, storing it appropriately.

There are Regulations about the storage of hazardous substances. The guidelines and Codes of Practice you looked at earlier would have talked about this. There is also information on the label and SDS.

Your chemical storage area needs to be:

- ☐ Above any flood level
- ☐ Fireproof
- ☐ Away from fuel storage
- ☐ Away from watercourses or drains
- ☐ Not too hot, e.g. it has rooftop ventilation
- ☐ Locked

It should also have:

- ☐ Warning signs outside
- ☐ Bunded concrete flooring
- ☐ Good ventilation and light
- ☐ Steel shelves
- ☐ Enough room to separate powders above liquids
- ☐ A fire extinguisher, first aid kit and spill kit
- ☐ A safety shower with eye wash in case someone gets splashed

The Regulations say that your workplace must keep an inventory of the chemicals on hand. This should be kept with the SDS for each chemical used, and it should be stored separately from the chemicals.

PRACTICAL ACTIVITY

Go and check your chemical storage area and tick the items above that it has.

STORING EQUIPMENT & PPE

Spray equipment can be stored in the same area as the chemicals.

PPE should be stored near to but separate from the chemical store area. This is so you can keep it clean and access it in case you need to clean up a spill. Remember that it is best to store PPE in a plastic tub with a lid.

When you have finished a spray job, you need to wash your PPE and then store it appropriately.

WORKBOOK ACTIVITY

Can you see any problems with this storage area?
Suggested solutions are at the bottom of the page.

.....

.....

.....

Unlocked, no lid on knapsack, PPE stored with chemical, respirator exposed to contamination.

R4

See *Pesticide Application Record*, *Resource R4*, page 60

4.3 REPORTING

The last stage of applying chemicals is completing the reporting requirements. You must do this to comply with the Regulations in your state or territory.

Your workplace will have a *Pesticide Application Record* or something like it. When you finish the spray job, you fill in your details and the work that you did. Have a look at the sample on the next page. If your workplace doesn't have a template, you can use the one in the *Resources* section of this book.

Your supervisor will file these forms with the JSA that you did while you were planning. Your supervisor will also update the chemical inventory to show what you have used.

WORKBOOK ACTIVITY

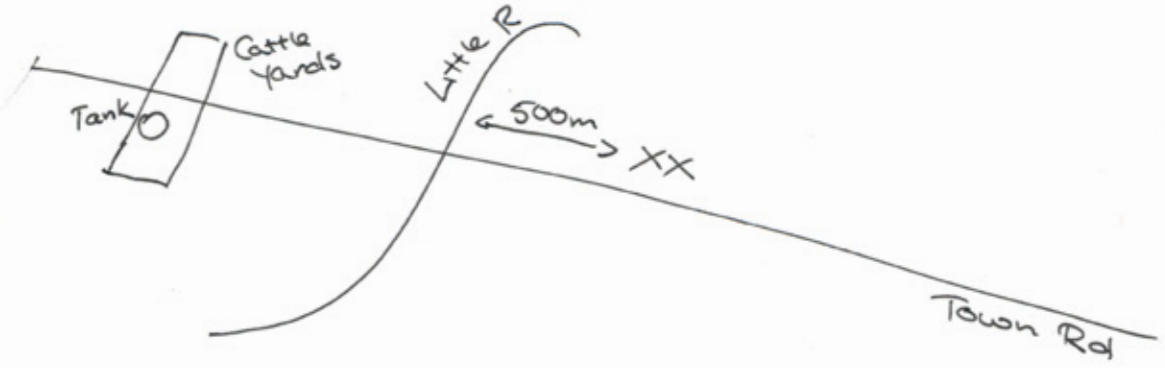
What is the procedure for reporting incidents in your workplace?

List any other reporting requirements relating to chemical use in your workplace.

EXAMPLE OF COMPLETED REPORT

Name of landowner	LITTLE RIVER COUNCIL			
Applicator's name	JOE BLOGGS			
Applicator's phone no.	08 9999 1234			
Applicator's address	PO BOX 72, LITTLE RIVER, WA			
Date of application: 13/3/14	Time started: 7:30 AM	Time finished: 9:00 AM		
Weather conditions	Clear sky ☐	Light cloud ☑	Overcast ☐	
Temperature	Cool ☐	Warm ☑	Hot ☐	
Wind speed	No wind ☐	Light wind ☑		
Wind coming from	North ☐	East ☐	South ☐	West ☑
Application method	FOLIAR SPRAY (SPOT)			
Pesticide product name	ROUND UP			
Active constituent: GLYPHOSATE	Concentration: 360g/L			
Mixing rate: 10 ml per L	Total quantity used (mix): 55 Litres			
Marker dye YES ☑ NO ☐				
Pest treated	GAMBA GRASS			
Location	GPS Coordinates: LAT: 15° 19' 13.98" S; LONG: 128° 14' 36.17" E			

Draw a mud map indicating any people, stock or sensitive areas



Signature of applicator	Date 13/3/14.

5 PROJECT ACTIVITY

PROJECT

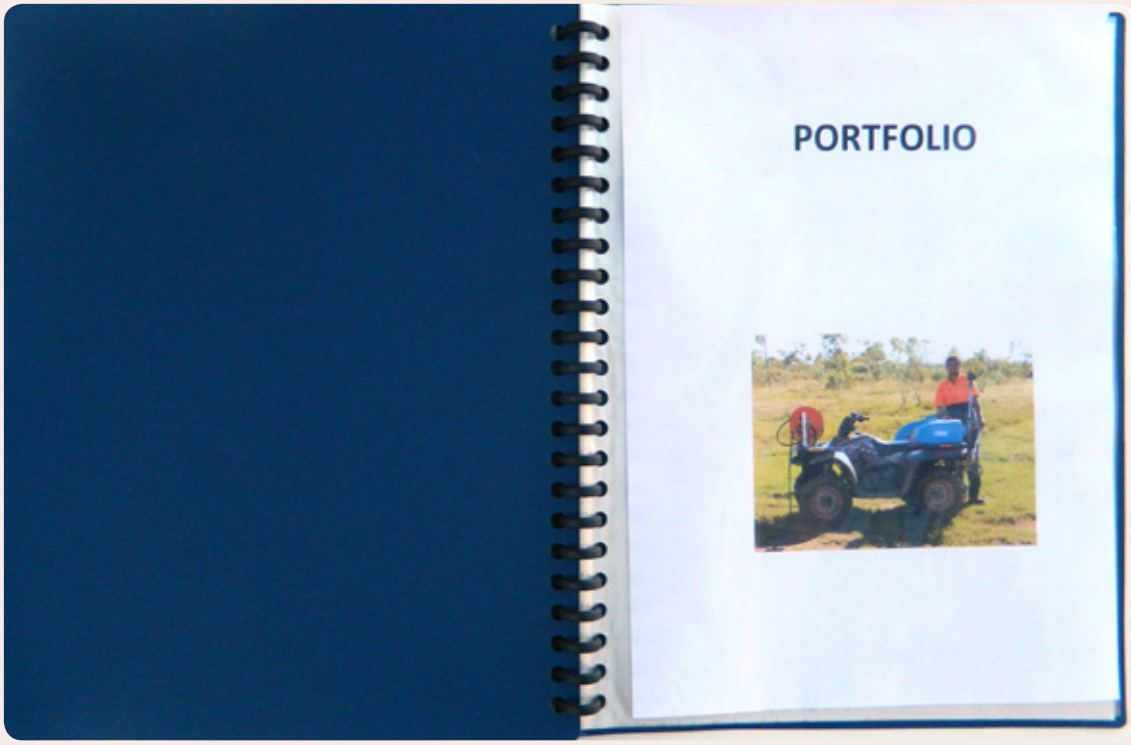
This is where you put together everything you have learnt.

You will be involved in a pesticide application job.
With your team, work through all of the stages:

1. Getting ready
2. Applying the chemical
3. Finalising the work

Compile a portfolio to show your understanding of all the topics. This can include copies of the following documents:

- The spray plan
- Any SOPs you used
- The JSA
- Pre-start checklists of equipment
- Pesticide application record
- Incident report if applicable
- Any other workplace reporting requirements
- Photos of you working on the job (make sure you have the correct PPE)
- Your First Aid Certificate if you have it



RESOURCES

STATES & TERRITORIES: ACTS, CODES OF PRACTICE, LICENSING R1

ACT LEGISLATION ABOUT PESTICIDES

Environment Protection Act 1997
Environment Protection Regulation 2005
Pest Plants and Animals Act 2005
Dangerous Substances Act 2004
Health Act 1993

FURTHER INFORMATION
www.environment.act.gov.au – Check under 'Environment'

NEW SOUTH WALES LEGISLATION ABOUT PESTICIDES

Pesticides Act 1999
Pesticides Regulation 2009
Environmental Planning and Assessment Act 1979
Dangerous Goods (Road and Rail Transport) Act 2008
Public Health Act 2010

CODES OF PRACTICE
Safe Use and Storage of Chemicals (Including Pesticides and Herbicides) in Agriculture Code of Practice 2006
Safe Use of Pesticides Including Herbicides in Non-Agricultural Workplaces Code of Practice 2006
Control of Workplace Hazardous Substances Code of Practice 2006

LICENSING
A certificate of competency is required from NSW WorkCover

FURTHER INFORMATION
www.dpi.nsw.gov.au
www.epa.nsw.gov.au – Search for 'pesticides'
www.workcover.nsw.gov.au

NORTHERN TERRITORY LEGISLATION ABOUT PESTICIDES

Agricultural and Veterinary Chemicals (Northern Territory) Act
Weeds Management Act 2001
Weeds Management Regulations 2006
Medicines, Poisons and Therapeutic Goods Act 2012
Dangerous Goods Act
Dangerous Goods Regulations
Public and Environmental Health Act 2011
Environment Protection Authority Act 2012

CODES OF PRACTICE
Code of Practice for the Handling of Pesticides

LICENSING
Licensing is required from the NT health department

FURTHER INFORMATION
www.lrm.nt.gov.au/weeds
www.health.nt.gov.au – Search for 'pest control operators'

QUEENSLAND LEGISLATION ABOUT PESTICIDES

Agricultural Chemicals Distribution Control Act 1966
Agricultural Chemicals Distribution Control Act Regulation 1998
Chemical Usage (Agricultural and Veterinary) Control Act 1988
Agricultural Chemicals Distribution Control Regulation 1998
Environmental Protection Act 1994
Environmental Protection Regulation 2008
Pest Management Act 2001
Pest Management Regulation 2003

CODES OF PRACTICE

Managing Risks of Hazardous Chemicals in the Workplace Code of Practice 2013
Fish Habitat Area Code of Practice 2005 (The lawful use of physical, pesticide and biological controls in a declared Fish Habitat Area)
Mosquito Management Code of Practice 2012
Code of Practice for the Control of Spray Drift and Use of Chemicals in Macadamia Orchards 2003

LICENSING

Licensing is required from the Queensland health department

FURTHER INFORMATION

www.daff.qld.gov.au – See 'Agvet' under 'Biosecurity'
www.business.qld.gov.au – Search for 'chemical controls' and 'getting into the pest management industry'
www.health.qld.gov.au/ph/ehu

SOUTH AUSTRALIA LEGISLATION ABOUT PESTICIDES

Agricultural and Veterinary Products (Control of Use) Act 2002
Agricultural and Veterinary Products (Control of Use) Regulations 2004
Natural Resources Management Act 2004
Environment Protection Act 1993
Controlled Substances Act 1984
Controlled Substances (Pesticides) Regulations 2003
Dangerous Substances Act 1979
Public and Environmental Health Act 1987

INDUSTRY GUIDELINES AND CODES OF PRACTICE

EPA Guidelines for Responsible Pesticide Use 2005
Code of Practice for Diluting Pesticides from a Water Supply
Termiticides (Safe Use) Code of Practice
Code of Practice Summer Weed Control

LICENSING

Licensing is required from the SA health department

FURTHER INFORMATION

www.pir.sa.gov.au/biosecuritysa
www.epa.sa.gov.au – Search for 'pesticide'
www.sahealth.sa.gov.au – Check under 'Protecting public health'

TASMANIA LEGISLATION ABOUT PESTICIDES

Agricultural and Veterinary Chemicals (Control of Use) Act 1995
Agricultural and Veterinary Chemicals (Control of Use) Regulations 2012
Agricultural and Veterinary Chemicals (Control of Use) Order 2001
Weed Management Act 1999
Dangerous Substances (Safe Handling) Act 2005
Public Health Act 1997
Environmental Management and Pollution Control Act 1994

CODES OF PRACTICE

Code of Practice for Ground Spraying
Code of Practice for Spraying in Public Places
Tasmanian Reserve Management Code of Practice
Labelling of Workplace Hazardous Chemicals Code of Practice
Managing Risks of Hazardous Chemicals in the Workplace Code of Practice
Occupational Licensing (Supervision of Prescribed Work) Code of Practice
Forest Safety Code (Tasmania)

LICENSING

Licensing is required from the Tasmanian primary industry department

FURTHER INFORMATION

www.dpipwe.tas.gov.au – Check under 'Biosecurity'
www.worksafe.tas.gov.au

VICTORIA LEGISLATION ABOUT PESTICIDES

Agricultural and Veterinary Chemicals (Control of Use) Act 1992
Agricultural and Veterinary Chemicals (Control of Use) Regulations 2007
Dangerous Goods (Storage and Handling) Regulations 2012
Dangerous Goods Act 1985
Catchment and Land Protection Act 1994
Public Health and Wellbeing Act 2008
Public Health and Wellbeing Regulations 2009
Environmental Protection Act 1970

INDUSTRY GUIDELINES

Guidelines for the Safe use of Pesticides in Non-Agricultural Workplaces
Code of Practice for the Storage and Handling of Dangerous Goods
Guidelines for Pest Control Operators in Victoria

LICENSING

Licensing is required from the Victorian health department

FURTHER INFORMATION

www.depi.vic.gov.au
www.worksafe.vic.gov.au
www.health.vic.gov.au – Search for 'pest control licensing'

WESTERN AUSTRALIA LEGISLATION ABOUT PESTICIDES

Health Act 1911
Health (Pesticides) Regulation 1956
Poisons Act 1964
Biosecurity and Agriculture Management Act 2007
Agriculture and Related Resources Protection (Spraying Restrictions) Regulations 1979
Dangerous Goods Safety Act 2004 and various Regulations
Environmental Protection Act 1986
Environmental Protection Regulations 1987
Agricultural and Veterinary Chemicals (Western Australia) Act 1995

INDUSTRY GUIDE

A guide to the use of pesticides in Western Australia: Providing information on legislation, policies and best practice

LICENSING

Licensing is required from the WA health department

FURTHER INFORMATION

www.agric.wa.gov.au – Check under 'Pests, weeds & diseases'
www.public.health.wa.gov.au
www.commerce.wa.gov.au/WorkSafe

R2 USEFUL VIDEOS TO WATCH

Biosecurity Queensland [YouTube channel]. Queensland Government.
http://www.youtube.com/user/BiosecurityQld/videos

Weed control videos. [Online video collection]. Brisbane City Council.
http://weeds.brisbane.qld.gov.au/weed-control-videos

Unwelcome strangers: Weeds on Aboriginal Country [Online video]. CSIRO.
http://indigitube.com.au/video/item/1610

PRE-START CHECK LIST

R3

PRE-START CHECK FOR SPRAY EQUIPMENT

	☑
• Pumping/pressure system works properly	
• Pressure gauges work	
• Filters are clean	
• Tank is clean and dry with no residue	
• Tank has no leaks – check by looking	
• Hoses and clamps have no leaks – check by looking	
• Wands and hand pieces work properly	
• Nozzles are the right type for the job	
• Nozzles are not blocked	
• Tank capacity (how many litres it holds)	

ADDITIONAL PRE-START CHECK FOR MOTORISED SPRAY EQUIPMENT

	☑
• General condition of engine – check by looking	
• Pump has no leaks	
• Fuel	
• Engine oil	
• Air filter	
• Condition of starting rope	
• Battery – if electric start	
• Mounting is secure	

R4 PESTICIDE APPLICATION RECORD

Name of landowner				
Applicator's name				
Applicator's phone no.				
Applicator's address				
Date of application		Time started		Time finished
Weather conditions	Clear sky ☐	Light cloud ☐	Overcast ☐	
Temperature	Cool ☐	Warm ☐	Hot ☐	
Wind speed	No wind ☐	Light wind ☐		
Wind coming from	North ☐	East ☐	South ☐	West ☐
Application method				
Pesticide product name				
Active constituent			Concentration	
Mixing rate ml per L			Total quantity used (mix) Litres	
Marker dye YES ☐ NO ☐				
Pest treated				
Location			GPS Coordinates	
Draw a mud map indicating any people, stock or sensitive areas				
Signature of applicator			Date	

GLOSSARY

Active constituent	The active constituent in a pesticide is the ingredient that actually poisons the pest.
Aquifer	An aquifer is a body of rock underground that holds water or has water moving through it.
Beneficial	Something that is beneficial will bring a good outcome.
Contaminate	To contaminate is the same as to pollute.
Decant	To decant means to pour a liquid from one container into another container.
Dermal absorption	Dermal absorption happens when a pesticide gets onto the skin and enters the body.
Eradicate	To eradicate means to get rid of or completely destroy.
Hazard	A hazard is something that can cause injury, or damage the health of a person or animal.
Ingestion	Ingestion means to swallow something and it goes into your stomach.
Inhalation	Inhalation means to breathe something into your lungs.
Mandatory	You must do things that are mandatory, because they are required by law.
Manufacturer	A manufacturer is a company that makes things and then sells them.
Resistance	If a plant has resistance to a particular pesticide, it means that it will not be affected by that pesticide.
Risk	Risk is a measure of how likely it is that an injury will happen and how serious the injury is likely to be. There is a high risk of serious injury when using chemicals. You can reduce the risk by applying controls, such as following instructions on the label and wearing PPE.
Susceptible	If something is susceptible it means it can be easily harmed by something else.
Topography	Topography is the layout of the land. For example, you can say that an area has mountainous topography or flat topography.
Add your own words and meanings here	

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ALEP

Aboriginal Landcare Education Program

APPLY CHEMICALS UNDER SUPERVISION

This learning guide covers information about using chemicals as part of a program to manage pests.

Topics include:

- INTEGRATED PEST MANAGEMENT
- TYPES OF CHEMICALS
- USE CHEMICALS SAFELY
- LEGISLATION
- READ THE LABEL
- READ SAFETY DATA SHEETS
- PREPARE & MAINTAIN PPE, EQUIPMENT & TOOLS
- STORE & TRANSPORT CHEMICALS
- EFFECTS OF WEATHER
- APPLICATION METHODS
- DISPOSE OF WASTE
- HANDLE EMERGENCIES
- DOCUMENT CHEMICAL APPLICATION

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