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Workplace Health and Safety Queensland

Rural chemicals guide 2010

Department of Justice and Attorney-General

Queensland Government

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1 Introduction

This *Rural Chemicals Guide 2010* provides advice to people working in the rural industry on managing risks to health and safety arising from the storage, use, transport and disposal of chemicals at rural workplaces. It provides practical information to the end-users on how to comply with the relevant legislation, including Part 16 of the *Workplace Health and Safety Regulation 2008* relating to rural chemicals. These include:

- pesticides
- herbicides
- fertilisers
- fuels
- disinfectants
- emissions such as dusts or fumes.

The guide also:

- includes advice on the storage and transport of chemicals classified as dangerous goods
- promotes safe and healthy practices when using chemicals
- assists users to minimise adverse effects to human health and the environment
- ensures consistency with chemical usage and relevant environmental legislation.

The information in the guide will be useful for:

- farmers
- pastoralists
- horticulturists
- orchardists
- foresters
- trainers and educators
- medical practitioners
- government officers.

1.1 Definitions

ADG Code means the *Australian Code for the Transport of Dangerous Goods by Road and Rail* prepared by the Australian Transport Safety Bureau.

Chemical means any of the following:

(a) agricultural and veterinary chemical (agvet) including any plant growth regulatory material and any pest destroyer other than a lure. The term includes fertilisers, pesticides, herbicides and adjuvants;
(b) any hazardous substance;
(c) any dangerous good; or
(d) any substance contained in a schedule of the *Standard for Uniform Scheduling of Drugs and Poisons* (SUSDP).

Note: The definition focuses on synthetic pesticides and herbicides which should be used according to the registration and approval conditions. The definition also includes all chemicals used in the rural workplace including fertilisers, fuels, veterinary chemicals, lures, soil conditioners and disinfectants.

Container means anything in or by which a substance or item is wholly or partly cased, covered, enclosed, or packed, whether such thing is empty, or partially or completely full, but does not include a vehicle or freight container.

Dangerous good means a substance or item specifically listed in the ADG Code or which meet the classification criteria of Section 2 of the code.

Employer

1. A person is an employer if:
   (a) the person conducts a business or undertaking; and
   (b) in the conduct of the business or undertaking, the person engages someone else to do work, other than under a contract for services, for or at the direction of the person.
2. For subsection (1)(b), a person engages someone else to do work whether the person engaged works for gain or reward or on a voluntary basis.
3. For an apprentice or trainee who is employed by a group training organisation, the employer is—
   (a) when the apprentice or trainee is engaged to do work for a host employer—the host employer; or
   (b) otherwise—the group training organisation.
4. In this section:
   apprentice means an apprentice under the *Vocational Education, Training and Employment Act 2000*.
   group training organisation means a group training organisation under the *Vocational Education, Training and Employment Act 2000*.
   host employer means a person who contracts with a group training organisation for the training of apprentices and trainees.
   trainee means a trainee under the *Vocational Education, Training and Employment Act 2000*.

Exposure means the contact between a person and a chemical. The chemical may be airborne, or a solid or liquid. Exposure reflects a potential for absorption via any routes of entry including inhalation, skin absorption and ingestion.

Exposure standard means the airborne concentration of a particular substance in a person's breathing zone, as established in the *Exposure Standards for Atmospheric Contaminants in the Occupational Environment,* published by Safe Work Australia.

Handling means the controlled movement of any chemical within a rural workplace.

Hazard is the potential for a chemical to cause an adverse effect.

Hazardous substance means a substance which:

(a) is listed in Safe Work Australia's publication, *List of Designated Hazardous Substances*
(b) has been classified as a hazardous substance by the manufacturer or importer, in accordance with Safe Work Australia's *Approved Criteria for Classifying Hazardous Substances.*

Health surveillance means any monitoring of any person, including biological monitoring and clinical procedures undertaken by a medical practitioner, for the purpose of determining health status in relation to occupational exposure to a chemical. The term does not include atmospheric monitoring.

Material safety data sheet (MSDS) means a document prepared in accordance with Safe Work Australia's requirements for the preparation of material safety data sheets. These contain information on the identification, health hazards, precautions for use and safe handling of a substance.

Personal protective equipment means clothing, equipment and/or substances which, when worn correctly, protect part or all the body from risks of injury or disease at work or in the workplace.

Pesticide means an agricultural or veterinary chemical product that is represented as being suitable for, or is manufactured, supplied or used for, the control of pests. A pesticide is a substance or a mixture of substances that is represented, imported, manufactured, supplied or used as a means of directly or indirectly:

(a) destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation by or attacks of, any pest in relation to a plant, a place or a thing
(b) destroying a plant
(c) modifying the physiology of a plant or pest so as to alter its natural development, productivity, quality or reproductive capacity
(d) modifying an effect of another agvet chemical product
(e) attracting a pest for the purpose of destroying it.

The term also includes insect repellents for use on human beings.
A pesticide continues to be regarded as a pesticide even when it is mixed with some other substance (whether or not the other substance is a pesticide). However, a pesticide does not include a prescribed mixture or a mixture of a prescribed class or description.

Note 1: this includes herbicides, bactericides, baits, fungicides, insecticides, rodenticides, repellents and chemicals used for the control of animal ectoparasites.

Note 2: a pesticide may also be a hazardous substance, a dangerous good, a scheduled poison and a fumigant.

Producer means either a relevant person who is an employer, a self employed person or someone who employs persons to perform work for them in a rural industry, i.e. upon any agricultural or pastoral holding engaged in the production of food, livestock or flowers.

Record means written information generated at a rural workplace showing procedures in place.

Risk is the likelihood of a death, injury or illness that may result from a hazard.

Rural workplace means a workplace predominantly engaged in the production of stock, crop or plant material including any farm, orchard, nursery, vineyard, agricultural holding or pastoral holding.

Self-employed person – a person is a self-employed person if:
(a) the person conducts a business or undertaking for gain or reward
(b) in the conduct of the business or undertaking, the person is not an employer or worker.

Storage means the keeping of a chemical at any workplace; the term includes the keeping of any substance in use or in a ready to use condition.

Transport means the movement of a chemical from one workplace to another.

Use means any process, activity or operation in which a chemical is produced, prepared, utilised, expended or applied at a rural workplace.

2 Rural chemicals and the law

The Commonwealth Government and the Queensland Government both have legislation regulating rural chemicals. The Commonwealth Government regulates chemical sale and supply and the state regulates chemical use.

2.1 Commonwealth Government

Agricultural and Veterinary Chemicals Act 1994 (Cwth)
Agricultural and Veterinary Chemicals (Administration) Act 1992 (Cwth)
Agricultural and Veterinary Chemicals Code Act 1994 (Cwth)
Agricultural and Veterinary Chemicals (Queensland) Act 1994

The *Agricultural and Veterinary Chemicals Act 1994* establishes a framework for the government of certain territories about the evaluation, registration and control of agricultural and veterinary (agvet) chemical products.

The *Agricultural and Veterinary Chemicals (Administration) Act 1992* establishes the Australian Pesticides and Veterinary Medicines Authority (APVMA). It defines the functions and powers, and details financial and functional operational conditions under which the organisation operates. It also sets the parameters for the import and export of agvet chemicals into and out of Australia.

The APVMA regulates the manufacture, distribution and supply of products from registration up to, and including, the point of retail sale. Registration is granted to a new agvet product following a rigorous scientific evaluation that considers factors such as:

- product effectiveness
- human, animal and environmental safety
- the potential impact on trade.

This process includes public consultation.

The manufacturer and potential marketer determine the protocols under which agvet chemicals may effectively be used. The manufacturer (registrant) submits a registration proposal to the APVMA for consideration. If the proposal is deemed to be satisfactory, an agvet chemical product is registered by the APVMA under the Agvet Code, which is a Schedule to the *Agricultural and Veterinary Chemicals Code Act 1994* (Commonwealth). The Agvet Code is recognised as Queensland law and referred to as the Agvet Code of Queensland under the *Agricultural and Veterinary Chemicals (Queensland) Act 1994* (AVC Act).

The AVC Act makes certain Commonwealth laws about agricultural and veterinary chemical products law in Queensland and operates in conjunction with the above mentioned Commonwealth Acts. The AVC Act grants the APVMA power to carry out its functions in Queensland, and allows the controls relating to the approval and registration of agvet chemicals to apply.

APVMA registration requires that precise instructions for the use of products are included on the approved product label and on the material accompanying the product at point of sale. Labels must contain information such as:

- the approved rate of use
- dose rate
- route of administration
- concentration of active constituents
- safety precautions
- withholding period.

Under the Agvet Code certain products are declared to be *restricted chemical products* because of the increased risk associated with their use. Supply and use of these products are restricted to authorised persons. An example of a restricted chemical product is the insecticide endosulfan (2005).

2.2 Queensland Government

The Queensland Government supplements the Commonwealth registration requirements by adequate and effective control-of-use legislation. People who use or store agvet chemicals in workplaces, or supply chemicals for use at work, have responsibilities under the *Workplace Health and Safety Act 1995* (the WHS Act), the *Dangerous Goods Safety Management Act 2001*, the *Agricultural Chemical Distribution Control Act 1966* and the *Chemical Usage (Agricultural and Veterinary) Control Act 1988*. Relevant persons who are an employer or a self-employed person have an obligation to establish and maintain a safe system of work.

Other legislation requires chemical users to take steps to protect the environment including taking care when disposing unwanted chemicals.

2.2.1 Workplace Health and Safety Act

Workplace Health and Safety Act 1995
Workplace Health and Safety Regulation 2008
Hazardous Substances Code of Practice 2003

The WHS Act influences workplace practices at every level of activity and the prime objective is to ensure everyone's health and safety, not just workers and employers, but also members of the public who may be affected by the activities at the workplace. The objective of the WHS Act is to prevent a person's death, injury or illness being caused by a workplace, by a relevant workplace area, by work activities, or by plant or substances for use at a relevant place. The WHS Act requires those with an obligation for health and safety (e.g. employers, the self-employed, workers, labour hire contractors) to follow a risk management approach by:

- **identifying** hazards
- **assessing** risks that may result because of the hazards
- **deciding** on control measures to prevent or minimise the level of the risks
- **implementing** control measures
- **monitoring** and **reviewing** the effectiveness of control measures.

Particular provisions of the legislation apply to certain types of hazardous substances, in addition to the general hazardous substances regulatory requirements. For example, organophosphate pesticides are a scheduled hazardous substance under Part 16 of the *Workplace Health and Safety Regulation 2008* and people mixing or using these products may require regular health surveillance.

Under this legislation, a material safety data sheet (MSDS) must be obtained for each hazardous substance used, and directions on the label must be followed. Workplace Health and Safety Queensland in the Department of Justice and Attorney-General administers this legislation.

2.2.2 Dangerous Goods Safety Management Act

Dangerous Goods Safety Management Act 2001
Dangerous Goods Safety Management Regulation 2001

The *Dangerous Goods Safety Management Act 2001* and the *Dangerous Goods Safety Management Regulation 2001* (DGSM) create broad safety obligations for people involved with the storage, handling and manufacture of hazardous materials, together with specific obligations for:

- occupiers and employees at locations where hazardous materials are stored or handled
- manufacturers, importers or suppliers of dangerous goods
- designers, manufacturers, importers, suppliers or installers of storage or handling systems for Major Hazard Facilities (MHFs) or Dangerous Goods Locations (DGLs) and Large Dangerous Goods Locations (Large DGLs). This group is generally not relevant to rural industry.

The requirements of the DGSM legislation increase as the quantity of dangerous goods stored at any premises exceeds specified amounts. Premises are classified into one of four categories as the quantity of dangerous goods increases:

small quantities	→	minor storage workplaces[1] (most rural properties)
medium quantities	→	dangerous goods locations (DGLs)
large quantities	→	large dangerous goods locations (Large DGLs)
very large quantities	→	major hazard facilities (MHFs)

Most rural properties, farms and chemical application contractors generally only store small quantities of rural chemicals, and therefore come under the provisions for minor storage workplaces. **Rural workplaces are exempt from being classified as a DGLs or Large DGLs if they are five or more hectares in area and are engaging in rural activities.**

Required control measures for rural workplaces include:

- identifying hazards and assessing risks
- obtaining and providing access to material safety data sheets for dangerous goods[2]
- maintaining a register of dangerous goods
- ensuring containers of dangerous goods are properly marked and labelled
- providing information placards on tanks containing dangerous goods
- training and supervising workers who use and store chemicals
- controlling ignition sources near flammable and combustible materials
- preventing interaction with other goods
- preventing contamination of food or personal care products
- containing and cleaning up chemical spills
- using personal protective equipment and safety equipment for workers
- safely disposing of storage and handling equipment
- securing unauthorised persons from access to dangerous goods.

The administration of the DGSM Act is the responsibility of several agencies. Workplace Health and Safety Queensland administers DG classes 2, 3, 4, 5, 6.1, 8, 9 and combustible liquids. Mines and Energy, Department of Employment, Economic Development and Innovation administers petroleum and gas products in DG class 2.

[1] A minor storage workplace is *a workplace that is not a major hazard facility or a dangerous goods location, where stated dangerous goods or combustible liquids are stored or handled*. Division 4 of Part 3 of the DGSM Regulation applies to minor storage workplaces.
[2] DGSM legislation does not require a MSDS for combustible liquids.

Rural workplaces are exempt from local government licensing requirements for flammable and combustible liquids.

See Appendix 8 for a list of common dangerous goods class ‘diamonds’.

2.2.3 Agricultural Chemicals Distribution Control Act

Agricultural Chemicals Distribution Control Act 1966
Agricultural Chemical Distribution Control Regulation 1998

The *Agricultural Chemicals Distribution Control Act 1966* (ACDC Act) controls aerial distribution of agricultural chemicals from aircraft, and ground distribution of herbicides (a subset of agricultural chemicals) from ground equipment. Controls include licensing of the businesses and their operators carrying out the aerial or ground distribution. The supporting subordinate legislation is the *Agricultural Chemicals Distribution Control Regulation 1998*. The ACDC Act provides for the issue of the following licences:

- an *aerial distribution contractor licence* to a business employing or engaging an agricultural pilot to distribute agricultural chemicals from aircraft
- a *pilot chemical rating licence* to the agricultural pilot in command of an aircraft distributing agricultural chemicals on behalf of, or under the direction of, an aerial distribution contractor
- a *ground distribution contractor licence* to a business employing or engaging a commercial operator to distribute herbicides from ground equipment
- a *commercial operator's licence* to a commercial operator distributing herbicides from ground equipment, on land that a person or their near relatives do not own or occupy, on behalf of, or under the direction of, a ground distribution contractor, or an aerial distribution contractor.

The ACDC Act also provides for the declaration of special areas called hazardous areas, where conditions apply and special permits are required for the aerial or ground distribution of certain volatile agricultural chemicals capable of causing damage to crops or animals.

Biosecurity Queensland within the Department of Employment, Economic Development and Innovation administers the ACDC legislation.

2.2.4 Agricultural Standards Act

Agricultural Standards Act 1994
Agricultural Standards Regulation 1997

The *Agricultural Standards Act 1994* provides for standards to be made about agriculture, including standards that regulate the sale and supply and limited use of aspects of agricultural requirements (fertilisers, stock foods and seeds for planting), and the sale and use of hormonal growth promotants. The supporting subordinate legislation is the *Agricultural Standards Regulation 1997*. Under the Act:

- agricultural requirements must be labelled in accordance with a standard or regulation
- false or misleading statements about agricultural requirements, and the certain characteristics about to the sale of livestock, are prohibited
- harmful or prohibited substances for agricultural requirements are prescribed under the regulation.

The label on a rural chemical container must contain information including:

- the identity and amount of the active constituent and any other poisonous substance
- the poison schedule, any cautionary statements, safety directions and first aid instructions
- the pests controlled by the chemical, and crops, animals or other host situations for which the chemical is registered
- the application rates for the chemical
- any restriction on methods of application
- the withholding periods
- directions for storage
- batch number and manufacture or expiry dates
- mixing instructions.

Biosecurity Queensland within the Department of Employment, Economic Development and Innovation administers the Agricultural Standards Act and Regulation.

2.2.5 Chemical Usage Act

Chemical Usage (Agricultural and Veterinary) Control Act 1988
Chemical Usage (Agricultural and Veterinary) Control Regulation 1999

The *Chemical Usage (Agricultural and Veterinary) Control Act 1988* (CUC Act) controls the use of agricultural and veterinary chemicals, and substances containing chemical residues. The supporting subordinate legislation is the *Chemical Usage (Agricultural and Veterinary) Control Regulation 1999*. Under the Act, agvet chemical users must:

- only use registered agvet chemical products or products authorised under permits issued by the APVMA
- use agvet chemical products in accordance with approved label instructions
- hold user accreditations for use of specific agvet chemicals which are prescribed under the regulation
- ensure treated food producing animals are appropriately identified
- keep records and use information relating to the use of veterinary chemical products
- keep records for use of specific higher risk agricultural chemicals as prescribed under regulation.

Recent amendments to the CUC Act have introduced environmental controls for the use of Prescribed Agricultural Environmentally Relevant Activity (ERA) Products in Agricultural Environmentally Relevant Activities (ERA's) as defined under Chapter 4A of the *Environmental Protection Act 1994*. The controls are prescribed in the regulation for preparation and application methodologies and qualifications, meteorological conditions and maximum application rates for the use of these products, as well as record keeping requirements. Primary documents, such as farm image maps, pesticide purchase receipts and training certificates must also be retained and provided upon request. The new environmental controls commenced on 1 January 2010 and apply **in addition** to label instructions.

The CUC Act recognises an Environmental Risk Management Plan accredited under the *Environmental Protection Act 1994* as an alternate compliance mechanism for the above environmental controls.

Biosecurity Queensland within the Department of Employment, Economic Development and Innovation administers the Chemical Usage Act and Regulation. However, the Department of Environment and Resource Management (DERM) administers controls associated with Prescribed Agricultural ERA products.

2.2.6 Health Act

Health Act 1937
Health (Drugs and Poisons) Regulation 1996
Standard for the Uniform Scheduling of Drugs and Poisons **(Cwth)**

The *Health Act 1937* gives effect to the *Health (Drugs and Poisons) Regulation 1996*, which regulates farm chemical management.

The *Health (Drugs and Poisons) Regulation 1996* adopts the Commonwealth Government Therapeutic Goods Administration *Standard for the Uniform Scheduling of Drugs and Poisons* (SUSDP), which covers:

- the scheduling of individual products (poison schedules 7.6, 5.4)
- packaging and labelling.

The health regulation also contains provisions that:

- restrict public access to Schedule 7 products and require records to be kept when sold by retail outlets
- prohibit the use of food containers to store scheduled poisons.

Also, this legislation has requirements relating to the storage of Schedule 5 and 6 poisons to ensure that they are kept well away from the reach of children, as directed by the signal heading on the agricultural chemical product label.

Queensland Health administers the Health Act and Regulation.

2.2.7 Environmental Protection Act

Environmental Protection Act 1994
Environmental Protection Regulation 2008
Environmental Protection (Waste Management) Regulation 2000
Environmental Protection (Waste Management) Policy 2000
Environmental Protection (Water) Policy 1997

The *Environmental Protection Act 1994* (EP Act) with its subordinate regulations and policies is primarily concerned with preventing the off-farm impact of agvet chemicals. The EP Act requires every person to display a general environmental duty of care, and not to carry out any activity that causes, or is likely to cause, environmental harm unless all reasonable and practicable measures are taken to prevent or minimise the harm. An activity (e.g. release of agvet chemicals) that causes serious or material environmental harm, or creates an environmental nuisance, is unlawful unless authorised by the EPAct.

Chapter 4A *Great Barrier Reef Protection Measures* of the *Environmental Protection Act 1994*, defines cattle grazing on properties in excess of 2000 hectares and commercial sugarcane production in the Burdekin dry tropics, Mackay-Whitsunday and Wet Tropics catchments, as Agricultural Environmentally Relevant Activities (ERAs).

The purpose of the new chapter is to reduce the impact of Agricultural ERAs on the quality of water entering the Great Barrier Reef. The purpose is achieved by requiring:

- regulated property owners to take soil tests and calculate the optimum amount of fertiliser to apply, to prevent over fertilisation of their property
- record keeping of, among other things, the amount and type of agricultural chemicals applied on a property
- cattle and cane properties above a certain threshold to prepare an Environmental Risk Management Plan to detail how hazards on the property will be managed to reduce their risk of contributing to reef water quality decline.

The new requirements commenced on 1 January 2010 and more information is available at www.reefwisefarming.qld.gov.au or telephone 1300 130 372 and press option 8.

The *Environmental Protection Regulation 1998* prohibits environmental nuisance caused by the emission of fumes and odour. Nuisance complaints must be investigated and responded to by the administering authority.

The *Environmental Protection (Waste Management) Regulation 2000* and the associated *Environmental Protection (Waste Management) Policy 2000* prohibits the dumping of waste agvet chemicals or containers, other than at approved waste management facilities. Waste agvet chemicals are 'regulated wastes' and their handling and disposal is subject to specific approvals and conditions relating to their transport, handling and disposal.

The *Environmental Protection (Water) Policy 1997* prohibits the release of any agvet chemical to stormwater drains or waterways, although use of an agvet chemical in accordance with label instructions (e.g. for weed control) is considered a defence against any prosecution.

The Department of Environment and Resource Management administers the EP Act and Regulations.

3 Legal requirements

3.1 Employers
As a relevant person, an employer has an obligation under the WHS Act to ensure the workplace health and safety of themselves, their workers and others is not affected by the conduct of their business or undertaking.

3.2 Occupiers
Under the *Dangerous Goods Safety Management Act 2001*, occupiers of rural places have obligations for the safe use and storage of dangerous goods and combustible liquids.

3.3 Self-employed persons
As a relevant person, a self-employed person has an obligation under the WHS Act to ensure the workplace health and safety of themselves and others is not affected by the conduct of their business or undertaking.

3.4 Workers
Workers must maintain safe work practices when working with or near chemicals, so that their own health and safety and that of others (including members of the public) are not affected.

When working with or near chemicals workers must:
- comply with instructions given by their employer about the use and storage of chemicals
- use personal protective clothing and equipment provided by their employer, in the manner they have been properly instructed to use it
- not wilfully or recklessly interfere with or misuse anything provided in the interests of health or safety.

3.5 Suppliers of hazardous substances (chemicals)
Suppliers of hazardous substances must provide information on:
- the health hazards
- precautions for use
- safe handling of a chemical at a workplace.

If information is not provided, the producer has the right to refuse to accept the delivery.

Also, registered or approved agricultural and veterinary chemical containers must be labelled with the registered label in accordance with requirements of the APVMA.

All chemical containers must be labelled including:
- dangerous goods that are transported by road or rail as described in the ADG Code
- substances in a schedule of the *Standard for Uniform Scheduling of Drugs and Poisons*.

Suppliers must provide a current material safety data sheet with the first supply, or on request for chemicals classified as a hazardous substance or a dangerous good.

3.6 Aerial applicators

Under the *Agricultural Chemical Distribution Control Act 1966*, aerial applicators of pesticides must be licensed. Inquiries about this licensing should be directed to the Department of Employment, Economic Development and Innovation.

Spraysafe (www.aerialag.com.au)

Spraysafe is an Aerial Agricultural Association of Australia (AAAA) initiative which aims for continuing improvement and professionalism in the application of agricultural chemicals by aircraft. Spraysafe meets all state requirements in Australia, and features:

- a baseline self-audit
- periodic renewals
- an independent surveillance audit program of 20 per cent annually of accredited operators
- re-qualification requirements following loss of accreditation
- a requirement to advise AAAA of any significant change to activities
- improved pilot accreditation assessment that has been independently reviewed as meeting all of the national competencies for chemical application at better than AQF Level 3.

Operator accreditation: Operators are required to meet stringent guidelines in order to achieve Spraysafe accreditation, including a full inspection of the operators' facilities.

Pilot accreditation: Agricultural pilots are required to have a comprehensive knowledge of industry-related issues and practices. Pilots are examined on their knowledge. The pilots' Spraysafe accreditation has also been reviewed with the Professional Pilot Program, adding a three-year currency requirement to the accreditation.

Loader/Mixer accreditation: Loaders and mixers (ground support staff) have been trained in the correct methods of handling chemicals, using the *Chemical Handling Manual for Agricultural Aviation*, to ensure correct ground procedures are in place.

AAAA also undertakes the education of end-users, farmers, farm advisers and consultants.

4 Consultation

Workers should be consulted on chemical issues which may affect their health and safety. Workers know their jobs and the risks involved and are more easily able to identify these risks.

In a small workplace, consultation can be an informal discussion between the producer and their workers about the content of a MSDS and label, or during an inspection of the work area. In a large workplace with a number of workers, it may be appropriate to establish a formal process with the workplace health and safety representative.

Consultation:

- involves the sharing of information
- allows the exchange of views between the producer, workers and/or their representatives
- provides the opportunity to contribute to the decision-making in a timely way
- to pre-empt or resolve any problems
- fosters cooperation in the workplace.

Producers should consult with workers regularly about chemical use and storage particularly when:

- identifying and assessing risks associated with chemicals
- developing and implementing the control measures.

4.1 Issues for consideration

The consultative process about the use and storage of chemicals should regularly address the following:

- identifying risks associated with the use and storage of chemicals
- assessing risks associated with the use and storage of chemicals
- planning for the introduction of a new chemical or application method
- deciding what control measures can be taken
- training requirements
- advice to any workers with potential for contact with a particular substance
- the role of monitoring and health surveillance.

5 Information about chemicals

Information on the use and storage of rural chemicals is available in at least two forms:

- labels on chemical containers
- material safety data sheets.

Tanks containing dangerous goods must always be placarded.

5.1 Labels

All chemical containers must be labelled to ensure that the contents of the container can be readily identified and used correctly. The label must be kept fixed to the container at all times even after use as it contains information on safe disposal of the chemical and container.

Under the *Agricultural Standards Act 1994*, the label on a container of an agricultural chemical must contain information including:

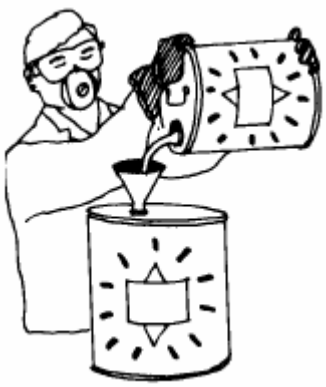
- the identity and amount of the active constituent and any other poisonous substance
- the poison schedule, any cautionary statements, safety directions and first aid instructions
- the pests controlled by the chemical, and crops, animals or other host situations for which it is registered
- the application rates for the chemical
- any restriction on methods of application
- the withholding periods
- directions for storage
- batch number and manufacture or expiry dates
- mixing instructions.

Hazardous substances, veterinary chemicals, dangerous goods and poisons, all have similar labelling provisions.

Some chemicals have labels that contain extensive information in booklet form that is inserted into an envelope or pocket on the container. These booklets should be returned to the envelope or pocket after use for future reference.

5.1.1 Decanting

A chemical must not be transferred from one container to another (decanted) unless the container to which it is being transferred is a chemical container and properly labelled.
Note: Be aware that some chemicals can react with the container.



The use of an agricultural or veterinary chemical from an unlabelled or incorrectly labelled container contravenes the *Chemical Usage (Agricultural and Veterinary) Control Act 1988*, and s201 of the *Workplace Health and Safety Regulation 2008*.

Decanting chemicals into a food or beverage container is an offence under the Poisons Regulations made under the Health Act, and there have been instances where both children and adults have become seriously ill or died because of consuming chemicals from these containers.

Note: The label on the new container must show that the container holds the same chemical at the same concentration as the original.

Decanting should be avoided because:
- flammable or toxic vapours may be released in the process
- maintaining identification of decanted contents in new containers is very difficult.

However, if decanting is carried out, it must be done in a well-ventilated area away from ignition sources.

5.1.2 Labelling of chemical application equipment

Labels should provide information on the storage and preparation for use of a chemical. However, where the chemical is in the application equipment, such as a spray tank, a label is not required where:
- it is filled with a chemical that has been prepared or diluted ready for use
- it will be controlled by the applicator
- there is minimal risk of any other person misusing it.

5.1.3 Container that is not properly labelled

Under the requirements of the *Chemical Usage (Agricultural and Veterinary) Control Act 1988*, a chemical must not be used from a container that does not have a registered label fixed to it.

For practical purposes, if the label has been lost and the contents of a container are known, a temporary label should be attached where practicable. If the product name is unknown, then it should be labelled:

"Caution. Do not use. Unknown substance."

All unlabelled chemical containers should be identified if possible, and disposed of promptly.

5.2 Material safety data sheet (MSDS)

5.2.1 Nature of information

Material safety data sheets provide information on hazardous substances or dangerous goods that is not on a label, and includes:
- health effects
- routes of absorption
- toxicological, physical and chemical data.

5.2.2 Availability of a MSDS

Suppliers must provide a MSDS for all hazardous substances and dangerous goods at point of sale and on request.

5.2.3 Purpose of a MSDS

Material safety data sheets are a major source of information on chemicals used and stored at the workplace and should be used for guidance when developing and implementing safe work practices.

A MSDS contains information on the hazards associated with a substance and the likelihood of that hazard becoming a risk at the workplace, i.e. cause adverse effects on health and safety, will depend on the:

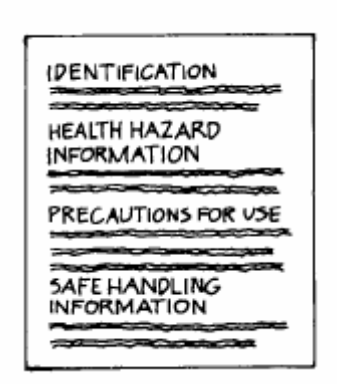
- concentration of the substance
- quantity of the substance being used
- time of exposure
- workplace tasks and other workplace conditions.

Producers should be aware that risks will vary according to the quantity and concentration of the chemical used. For concentrates, any information supplied applies to the raw concentrate and not to the chemical at application strength.

5.2.4 Content of a MSDS

A MSDS provides information under the following headings:

- identification
- health hazard information
- precautions for use
- first aid advice
- emergency response
- safe handling information.



A MSDS should provide enough information to be able to identify where a chemical may release **another** hazardous substance during normal use.

5.2.5 The physical form of a MSDS

A MSDS may be provided in a number of forms, including a paper copy (ideally laminated where it may be used in wet areas). The most appropriate form will depend on the particular needs of the workplace.

5.2.6 Worker access to a MSDS

Producers should ensure that a MSDS is available for each hazardous substance used and stored, and that access is readily available to a potentially exposed worker at each work site or designated area. Access to a MSDS may be required:

- during training (including induction)
- during the consultative process before the introduction of a new substance
- when a worker is working with the substance.

Producers should ensure:

- the most recent MSDS is available
- any information retrieval system for MSDS is kept in working order
- workers are trained on how to access the information.

Relevant persons who are self-employed must have a MSDS available for each substance being used and stored to meet their health and safety obligations.

5.2.7 Additional MSDS information

Manufacturers have a responsibility to ensure the information in a MSDS is accurate. However, producers can add additional information to a supplied MSDS if needed. The added information should be clearly marked to indicate that the additional material is not part of the original MSDS.

A producer can prepare a document summarising the supplied MSDS, including additional information such as specific conditions for the particular workplace, other contact people, site-specific control measures, personal protection, other physical properties and environmental effects. The document may be used as the basis for a safe work procedure in the workplace. The producer has the responsibility for keeping the information in the document accurate, and it must be amended to reflect any changes made by the manufacturer in the supplied MSDS.

Where a document is prepared by the producer, workers must still have access to the MSDS prepared by the manufacturer.

5.3 Dangerous goods placarding

At rural places, tanks containing dangerous goods must always be placarded (see s77 of the DGSM Regulation). At Dangerous Goods Locations, buildings containing packaged dangerous goods must be placarded and a HAZCHEM sign placed at every entrance to the property (see ss 49-55 of the DGSM Regulation).

For further guidance, consult *DGSM Information Paper No. 1 – Placarding for Dangerous Goods Storage* available from www.worksafe.qld.gov.au.

5.4 Other relevant information

The producer should also provide information to workers on the equipment used in the application of rural chemicals. This should include information on the normal use for which the chemical application equipment was designed and any conditions necessary for its safe use.

6 Managing chemical risks

The risks associated with any activity involving the use and storage of chemicals must be managed. Managing risks enables workplaces to assess all the risk factors related to an activity involving chemicals and to make a judgement about how to manage those risks including implementing appropriate control measures.

The process of managing risks involves:

a) **identifying** the chemical hazards that pose a risk in the workplace
b) **assessing** the degree of risk created by the chemical, environment and related work processes
c) **determining** and **implementing** appropriate control measures
d) **recording** any action or work procedure established for the workplace
e) **monitoring** the effectiveness of the controls
f) **reviewing** the assessment periodically or whenever evidence emerges that a review is necessary.

A **hazard** is something with the potential to cause harm.

A **risk** is the likelihood that death, injury or illness might result because of the hazard.

6.1 Hazard identification

Initially, hazards created by the storage and use of chemicals in the workplace can be identified from the label, the MSDS and workplace conditions.

Other ways to identify hazards are available from:

- consulting with people familiar with the work
- the manufacturer or the local sales representative
- extension officers and consultants
- an approved training course such as those leading to accreditation by ChemCert Training Queensland
- industry associations and seminars
- scientific and technical literature
- Workplace Health and Safety Queensland
- Safe Work Australia.

6.2 Risk assessment

Risk assessment involves examining:

- the substances to be used
- the activities related to the use and storage of chemicals, with particular emphasis on the potential risk to workers and other people.

An assessment should be based on:

- information supplied on the label and/or MSDS
- an inspection of the work location, work practices and environmental factors.

Review of a risk assessment
Risk assessment should be an ongoing process and be reviewed to reassess the effectiveness of control measures as a result of:

- a change to a MSDS
- a change to work practices
- from responses to the consultative process.

Where this does not occur within a five-year period, an assessment should be reviewed.

6.2.1 Factors in a risk assessment

When doing a risk assessment, it is necessary to consider the factors in isolation and then their combined effect. The elements are the:

- risks associated with the hazard
- probability that an event or an exposure will occur
- length of time a person is exposed (ranging from occasional to continuous contact with the hazard)
- possible consequences that may result.

Risks associated with the hazard
The risks associated with any chemical can vary depending on whether the chemical is in storage, being used, or is likely to affect other people not necessarily in a particular workplace. Therefore, assessments must be made in three major risk areas, such as:

- risk to any person, property and the environment by accidental events such as spillage or fire where the primary focus of risk management is towards the elimination of such events (storage risks)
- risk to any person at the rural workplace from the day-to-day use where the primary focus of risk management is to control the contact with chemicals during the exposure of any person in a rural workplace (contact risks)
- risk to any person on an adjacent property who may be affected by the application of chemicals (e.g. spray drift).

Probability of an event or exposure occurring
The risk assessment should identify the probability of events or exposure occurring, and this should be considered when determining which control measures should be used. The probability of an event occurring should be reduced as far as reasonably achievable.

Exposure duration
The longer a person is exposed to a chemical, through either mixing or spraying operations, the greater the risk of absorbing an excessive quantity of that chemical, particularly when handling the chemical in its concentrated form.

Consequences of contact with the hazard
The consequences of contact with a chemical are related to the known health effects. Health effects information, which is on the MSDS and may be on the label, will enable this risk factor to be assessed. Where the consequence of contact is more severe, further efforts should be made to minimise the risk.

6.3 Control measures

Control measures must be implemented to eliminate or reduce the potential for events such as:

- chemical storage accidents
- the occupational exposure of producers, workers and other people
- effects on non-target crops, animals and the environment.

Practicability of control measures
The control measures adopted should correspond to the severity of the risk involved and the cost (in money, time and effort) in preventing or mitigating risk. A higher risk would justify higher costs spent in control of that risk.

6.4 Managing exposure

Because the results of unacceptable occupational exposure range from short-term (acute) to long-term (chronic) effects, all chemical products must be treated with caution. Risks vary with the method in which a chemical is used, even though chemicals undergo rigorous testing before registration.

How does exposure occur?
Any person exposed to chemicals can absorb them by:

- **Inhalation** – the major route of entry for most chemicals in the workplace. Exposure occurs by inhaling airborne concentrations of a chemical.
- **Skin contact** – the second most common route of entry for most chemicals as they are readily absorbed through the skin.
- **Ingestion** – a minor contribution to exposure except in the cases of accidents. Smoking or eating while handling chemicals is often the course of accidental ingestion.

Who is at risk?
Anyone directly connected with a chemical use operation is at risk, including those who mix, load and spray or those likely to come into contact with the crop immediately after chemical spraying.

Chemicals for which health surveillance may be needed
The chemicals used on properties which cause most cases of poisoning are the organophosphorus compounds (OPs) and carbamates. The effects of ongoing exposure to small amounts of these chemicals may be determined by health surveillance.

The onset of poisoning with these chemicals can be very sudden. Poisoning results from either a single large dose, or through cumulative effects of small doses over a number of days.

See Appendix 7 for an example of managing occupational exposure. This is a case study of risk management using task analysis.

6.5 Risk factors in assessing exposure

The risk of exposure may be estimated by considering the effect on a person of the hazard and all factors that contribute to the hazard. Important factors when considering risk are:

- operation and tasks — high risk areas
- probability — of exposure occurring
- contact time — the hazard — person contact time
- consequence — the effect/outcome of the hazard.

6.5.1 High risk operations and tasks

High risk areas are those where chemicals are likely to be absorbed by any person where:

- chemicals are used in the concentrated form
- application techniques may cause adverse exposure
- environmental factors (e.g. wind speed and direction) may affect application techniques that cause adverse exposure.

Note: High risks may also occur where spraying is conducted close to populated areas.

6.5.2 Probability

The probability that exposure will occur is related to:

- **task specific variables** including the difference between manual application of a chemical and that done from an air-conditioned tractor cabin fitted with organic vapour filtration
- **workplace design variables** including the difference between fruit treatment by dipping in the non-ventilated space of a packing shed rather than a well-ventilated space
- **substance specific variables** including:
  - the difference between a product as a liquid or a powder
  - the difference in volatility between an ester and an amine salt of 2,4-D.

6.5.3 Contact time

Most hazard data on chemicals, especially toxicity data, have been derived from experiments in controlled conditions. In applying such data to workplaces, an additional factor of **contact time** must be considered. The time spent in contact with a chemical directly affects the dose of the chemical received. Dose means the quantity of chemical entering (and subsequently affecting) the body over a period of time.

All the other risk factors mitigate the extent of the exposure. Contact time is important in estimating the likely dose of any chemical.

Example - If a knapsack spray is being used and a chemical leaks out of the unit and over clothing, the operator will be in contact with the chemical for the whole period the knapsack is used, greatly increasing contact time. This means that the **length of time** when skin absorption may occur is increased.

6.5.4 Consequence

The consequence or extent of the risk is related to:

- The substance in use. The toxicity of the product will contribute to the effects of exposure. A less toxic chemical that provides adequate control of the pest should be chosen (see *substitution* in section 7.1). Toxicity information can be obtained from the poison scheduling on the label and MSDS.
- Known health effects including occupational exposure limits. Although chemicals undergo extensive testing before use, occupational exposure limits may not be set for all chemicals. In these cases, the label and MSDS information should be strictly followed and all exposures kept to a minimum.

6.6 Assessing the risk

Following the gathering of information and an inspection of the workplace, including observing the tasks involving the use and storage of chemicals, it should be possible to identify and assess some of the health and safety risks.

An assessment of the occupational exposure risk with a chemical is possible in certain situations if:

- inhalation is the only route of entry
- the airborne concentration of a chemical can be measured
- only one chemical (or others with similar toxicological characteristics) is present.

In these situations exposure can be estimated and compared with occupational exposure standards. These are *Adopted National Exposure Standards*, available from Safe Work Australia's Hazardous Substances Information System. They were formerly known as Threshold Limit Values (TLVs).

6.6.1 Role of health surveillance in risk estimation

Health surveillance may need to be performed where chemicals are used. Health surveillance involves monitoring a person to identify any changes to their health resulting from exposure to a chemical.

Health surveillance is not the primary means of managing occupational exposure in the workplace, but if health surveillance shows adverse results, the jobs and tasks of the person affected must be examined and control measures introduced or existing ones reviewed to prevent a recurrence of excessive exposure.

6.6.2 Conclusions about risk in rural workplaces

Producers should always reduce chemical exposure in the workplace to **As Low As Reasonably Achievable (the ALARA principle).**

The ALARA principle can be applied by considering the separate risk factors and implementing the control measures in the workplace provided in Section 7.

The principle should be applied even where occupational exposure is measured and occupational exposure standards are met.

7 Controls to reduce exposure

Control measures should be adopted that eliminate or reduce as far as is practicable, the exposure of any person to a chemical considering all possible routes of entry into the body. It may be appropriate to adopt more than one control measure to control exposure to everyone at the workplace and in the near vicinity.

7.1 Hierarchy of control

The preferred methods of risk control ranked in the order that they should be considered and adopted are:

1. **elimination** of a hazardous chemical
2. **substitution** by a less hazardous chemical
3. **isolation** processes to control the emission of, or the proximity to, the chemical
4. **engineering** control
5. **administrative** control
6. **personal protective equipment**.

7.1.1 Elimination

Exposure to a hazardous chemical may be eliminated by removing that substance from the workplace. In some circumstances, it may be economically viable to effectively control threatening pests and disease by non-chemical means. Things to consider include:

- hygiene
- removing pest breeding areas
- rotating crops
- use of beneficial insects or pathogens
- mechanical
- resistant crop varieties wherever they present a feasible alternative.

***Examples of elimination include*:**
Integrated Pest Management (IPM) programs, innovative biotechnology and proven biological control methods.

Chemicals should not be eliminated if elimination results in less effective pest management, but this must be considered if the exposure risk cannot be effectively controlled.

7.1.2 Substitution

Chemicals should not be substituted for a less hazardous one if substitution results in less effective pest control or a poorer quality product. However, it may need to be considered if occupational exposure cannot be effectively controlled.

Examples of substitution include:

- using a less toxic chemical
- using a less volatile chemical
- replacing an emulsifiable concentrate formulation with a granular formulation.

Note: This is a variation where the same product is used with the alteration occurring to the method of use of the substance.

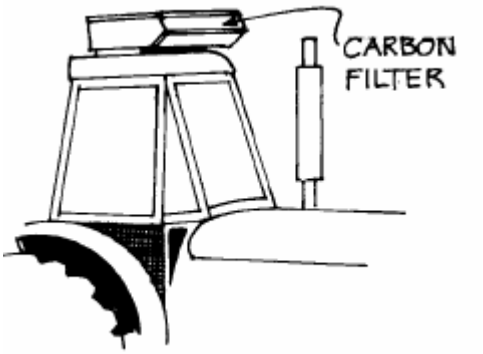
If a chemical is substituted for a less hazardous one, producers should consider substituting the chemical in a non-recyclable container for one in recyclable or low impact packaging where possible.

7.1.3 Isolation

The isolation process can be implemented by separating the process and anyone in the workplace from the rest of the workplace, or by a physical barrier between them.

Examples of isolation include:

- a separate area used for mixing and preparing chemicals with limited access to all but properly authorised workers
- use of air conditioned tractor cabins with activated and properly functioning carbon filters designed to remove chemical vapours.



Note 1: With any air filtration, contact time and exposure to chemicals may be increased as the chemicals may be recirculated through the tractor cabin.
Note 2: Carbon filters must be maintained properly if they are to remain effective.

7.1.4 Engineering controls

An engineering control is a system which:

- minimises the generation or emission of a chemical
- suppresses or contains a chemical
- delivers the chemical in a way that reduces misting.

Types of engineering controls include:

- the choice of application equipment
- a local extraction ventilation system
- an automated process.

Examples of engineering controls include:

- using an extraction ventilation equipment (ventilator) over a fruit dipping bath to remove solvent vapours
- changing nozzle parameters or droplet size or land spray pattern
- using a purpose-designed workplace with good natural or mechanical ventilation (adequate air movement).

7.1.5 Administrative controls

Administrative controls are ‘policy’ or behavioural type controls and can include:

- the time of work
- the hours of work
- who does the work and who has access to a work area or chemical store.

Administrative controls can be implemented to ensure safe work practices are adopted in the workplace.

Examples of administrative controls include:

- reducing the number of people exposed and excluding non-essential personnel access to a process
- limiting the period of exposure for a worker
- prohibiting eating, drinking and smoking when handling chemicals or treated product where any of these actions lead to increased exposure
- providing and ensuring the use of adequate facilities for effective decontamination
- ensuring that outdoor tasks are done at the most appropriate time of day.

Re-entry periods to crops may be mentioned as a special requirement on the label. These should be observed at all times.

7.1.6 Personal protective equipment (PPE)

Personal protective equipment should be used as a back-up for other control measures used to control a person's exposure to a chemical. However, personal protective equipment:

- is often mandatory according to the chemical label
- is essential as a safeguard against accidental exposure
- must be worn.

7.2 Selection, use and maintenance of PPE

Personal protective equipment should be selected based on the information provided on the chemical label and the MSDS.

Additional information on the selection and use of personal protective equipment may be obtained from the relevant Australian standards. Personal protective equipment manufactured to an Australian standard carries a mark on the product advising that it complies with the Australian standard and the number of that standard.

Producers should ensure that all personal protective equipment used in the workplace is:

- the most appropriate equipment for the task
- acceptable to the wearer
- readily available, clean and in a fully operational condition
- suited to the worker.

Producers should also ensure that:

- workers are trained in how to use the equipment
- the workers wear the equipment as intended
- any maintenance required is carried out
- the likelihood of a secondary injury risk caused by or due to wearing personal protective equipment has been assessed, e.g. a form of skin fungus or dermatitis caused by plastic clothing in hot conditions.

7.3 Recording control measures

Records should be maintained to confirm that exposure to chemicals is being managed in the workplace, that is, control measures are in place following a risk assessment. Records kept may include a simple annotation on a MSDS, a diary entry or a fully documented report.

Content of the record
The record should show the degree of the risk and the decisions made about the:
- selection, design, construction or adoption of any appropriate control measure
- selection and use of any personal protective equipment
- arrangements for training to ensure an appropriate application procedure is followed and the equipment is correctly used.

Form of the record
On small properties where both the number of chemicals and people are limited, the assessment and control record could be noted on the MSDS about how the control options on the MSDS were applied on the particular property. Alternatively, a note on the site assessment record may be adequate (Appendix 1 refers).

Examples of annotations on a MSDS:
The MSDS for an agvet chemical containing chlorpyrifos includes the following:
- **do not use in a confined space where ventilation is poor**
  Note: add a note to the MSDS that this chemical is not to be used in the confines of the packaging shed or nursery area unless certain ventilation measures are established.
- **wear a respirator suitable for this pesticide and with a Standards Australia approval**
  Note: add a note to the MSDS about the respirator/canister selected and the basis for the decision (e.g. manufacturer's advice). For a large operation, where the same chemical may be used by groups of workers involved in different tasks, and where there are many 'work units', the assessment record should include many of the items in the next example.

Possible topics on a complex assessment report (examples)
- Description of work unit.
- Name of assessor or assessment team.
- Personnel involved in the assessment.
- Work area, date and time of assessment.
- A list of chemicals (including concentration rate) used in that work unit.
- Summary of the task(s) of the work unit.
- Risk identification including all risks to health and safety.
- Conclusions about the level of risk.
- Recommendations for control measures and training.
- Signature of assessor.
- Signature of employer.

For most producers, a simple report attached to the original MSDS (or written on the MSDS) and dated would be sufficient.

7.4 Other occupational exposure topics

7.4.1 Measuring and mixing
Measuring and mixing chemicals should be done:
- by a person who knows the correct way to do the job
- in a well-ventilated area.

Personal protective equipment should be selected in accordance with the risk assessment outcome, the label directions and be worn correctly.

Accurate measuring devices should be available including:

- clean graduated jugs or cylinders
- a scale to prepare the mixtures.

In all circumstances, the label directions should be read beforehand and followed.

Effective and accurate calibration of equipment and estimation of quantity will minimise or eliminate any leftover prepared spray.

The measuring and mixing process is the most appropriate time to wash empty chemical containers. All chemical containers should be triple-rinsed and holed to render them unusable where they are not recyclable. The water used to rinse the container or rinsates should be added to the spray tank during mixing. Disposal of drums becomes a lesser environmental issue if they are rinsed correctly.

7.4.2 Equipment clean-up

After each spraying:

- the tank should be partially filled with clean water and rinsed to remove any remaining chemical mix from the tank
- personal protective equipment, most likely that selected for manual spraying, should be worn during cleaning
- the suction filter should be removed and washed, spray lines flushed and nozzles and nozzle filters washed
- chemical washed from the tank should be reused or sprayed over the crop or fallow ground.

7.4.3 Disposal of unwanted or unused chemicals

Unwanted or unused registered chemicals should be given to or traded with other people so they can be used as described on the label.

ChemClear provides a collection and disposal service for obsolete agvet chemicals to:

- primary producers
- agricultural and veterinary businesses
- the agricultural retail industry
- pest control managers
- forestry
- local and state government agencies
- golf courses
- any other users of agricultural and veterinary chemicals.

Croplife Australia Ltd, Animal Health Alliance, Veterinary Manufacturers Distributors Association (VMDA), the National Farmers Federation (NFF), and the Australian Local Government Association together with Agsafe Ltd have implemented the ChemClear program for the safe management and destruction of unwanted agvet chemicals.

For more information visit www.chemclear.com.au or call 1800 008 182.

7.4.4 Disposal site

Safe disposal of chemicals can be performed in controlled conditions, such as approved council waste disposal facilities.

Note: Some chemicals are not completely biodegradable, and if not disposed of properly, can contaminate the land or waterways.

7.4.5 Disposal of containers

Chemical containers (either empty or with unused chemicals) may pose serious risks to human health and safety. They should be disposed of or recycled according to the information on the label.

drumMUSTER is a national program set up to collect and recycle cleaned eligible non-returnable crop production and on-farm animal health chemical containers, in conjunction with local councils. *drumMUSTER* provides rural chemical users with means to safely dispose of used chemical containers. Containers must be cleaned so they are free of any chemical residue, and can then be delivered to one of over 700 receival sites across Australia.

For more information visit www.drummuster.com.au or call 1800 008 707.

Drums, other packages and containers should be returned to the supplier when the receptacle is marked 'returnable', or the label specifies return to point of sale. Where containers are stored, the lids or bungs must be removed to prevent reuse, and the containers must be secured.

Containers should not be burned. Explosions may occur and the smoke and fire present a risk to health.

7.4.6 Re-entry periods

The re-entry period is the time in which a field must not be re-entered after the application of a chemical on a crop unless personal protective clothing is being worn. The re-entry period will be stated on the label where it has been established.

Where no re-entry period is stated, as a minimum, re-entry by unprotected people should not occur until dusts have settled or sprays have dried. A preferable re-entry period where none is stated is 24 hours.

Re-entry periods are important to observe where contact with foliage and skin are unavoidable. Many chemicals are readily absorbed through the skin.

For example: Chippers may be required to remove weeds in a field with a crop such as tomatoes or cotton. If the crop has been recently sprayed with an organophosphate insecticide, workers will be at risk of absorbing (through the skin) sufficient residue by brushing past the leaves. By observing the re-entry period, the insecticide should have degraded to a less toxic level and so the risk of occupational exposure is reduced.

8 Training

Training ensures that everyone in the workplace has the appropriate skills and knowledge to use chemicals safely and without risk to health. Training should be undertaken in accordance with safe work procedures at the workplace.

A producer has a duty to provide appropriate training for themselves and their workers under the WHS Act. Under the Queensland *Chemical Usage (Agricultural and Veterinary) Control Act 1988*, a producer may be liable for any breaches of the Act, where the breach resulted from the activity of the producer or their workers.

8.1 Provision of training

Anyone involved in the storage and use of chemicals in a workplace must be properly trained, including:

- those who are required to store and use a chemical
- those workers who are supervising others working with a chemical
- those who are required to work in and around, or in close proximity to, the area in a workplace where the chemical is stored and used
- everyone likely to be involved in fire or emergency action.

Training may be carried out by producers or by engaging a person from outside the workplace. Training on the use and application of chemicals covered in this guide can be obtained by completing an approved Queensland Agvet chemical accreditation course.

8.2 Training methods

Training should be applicable to the workplace and the work being done. In some cases, formal training will be needed, whereas in others, on-the-job training may be more appropriate, e.g. practical training for a worker on how to safely adjust the nozzles on a boom spray.

The special needs of workers should be taken into account in deciding on the structure, content and delivery of training. These special needs include:

- literacy levels
- work experience
- specific skills required for the job.

If literacy levels are low, then spoken methods or highly graphic visual methods should be used. If workers are from non-English speaking backgrounds, then training should be provided in the appropriate languages understood by the workers.

Training should be practical and include a hands-on component where relevant, such as when training in the use and fitting of personal protective equipment.

8.3 Elements of a training program

The training program should cover:

- how to access the information on the label and MSDS
- instructions in the appropriate work methods including the correct use of personal protective equipment
- each person's role in an emergency.

The amount of detail required and extent of a training program will depend on:

- the hazards associated with the chemicals that are stored, handled, transported, mixed and applied
- the complexity of the work procedures
- any controls, work practices and personal protective equipment required to minimise risks.

The training program should be developed following an assessment of likely risks.

A training program should also cover the following:

8.3.1 Legislative requirements

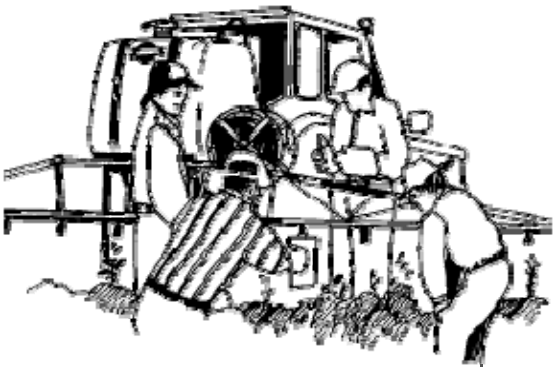
- Obligations under the *Workplace Health and Safety Act 1995*
- the *Workplace Health and Safety Regulation 2008,* Ministerial notices and codes of practice
- advice to people regarding the chemicals that they may store and use in the workplace
- the legal significance of a label
- the relationship to other relevant legislation relating to the transport, use, storage and disposal of chemicals in Queensland.

8.3.2 Information on a substance

- Recognising and interpreting the information on a label of a chemical container including:
  - safety directions
  - poison scheduling and dangerous goods classification
  - first aid and emergency procedures, and special directions
  - application rates, compatibility and withholding periods for chemicals.
- importance of being able to:
  - know the parts of the label and the significance of the information in each part
  - extract and interpret information from a product label
  - relate the hazard to the poisons schedule and dangerous goods classification
  - calculate the amount of agvet chemical to use to achieve the correct application rate.
- how to access the MSDS and the information each part of the MSDS can provide
- the selection, use, maintenance and storage of safety equipment required for the use of chemicals, e.g. activated carbon respirators for chemicals
- any work practice or procedure to be followed when using a chemical in the workplace.

8.3.3 Personal safety

- The routes of entry into the body of chemicals and ways of limiting exposure
- the risks posed by chemicals commonly used in the particular industry
- the precautions to be taken for a particular task, especially in respect of personal protective equipment and clothing, and the value in working with another person when very toxic chemicals are handled
- the correct use, fit and maintenance of personal protective equipment and clothing
- the maintenance of a safe working environment in a tractor cabin.



8.3.4 Application and environmental safety

- The application methods for agvet chemicals for a particular industry
- application techniques including:
  - selection of appropriate equipment for a particular chemical or use situation
  - importance of accurate and even application
  - nozzle selection for the job
  - calibration of equipment to minimise spray drift or other off-target application
  - calibration for efficient application
  - calculation of the amount of agricultural chemical to give the desired application rate
  - decontamination steps for equipment and clothing, and disposal
  - maintenance of equipment, e.g. nozzles, hoses, regulators, gauges, cartridges for respirators and tractor cabin filters.

8.3.5 Record keeping

- Preparation and appropriate use of an agvet chemical application record sheet and storage records (see examples in Appendices 2 and 3).

8.3.6 Emergency procedures

- Any procedure to be followed in case of an emergency involving chemicals
- any first aid or incident reporting to be followed in case of an injury or illness.

8.4 Review and records of training

The training program, including induction and refresher courses, should be reviewed at least once a year or:

- each time there is a change in:
  - any hazard information available
  - a work practice
  - a control measure.
- each time a worker is assigned to:
  - a new task
  - a new work area.

Training records

The training program records should include:

- the names of people being trained and date of attendance at any training program
- an outline of the course content
- the names of anyone providing the training
- where applicable, a person's accreditation certificate number.

9 Managing off-site risks

Consideration must be given to the possibility or likelihood of neighbours and other members of the public being exposed to chemicals. Residue levels must be considered, and advice about withholding periods must be followed. If spray drift is considered likely to occur, it must be controlled.

9.1 Residue levels

Each agvet chemical registered for sale has been approved for use under conditions specified on the label. Additional 'off-label' uses may also be approved and these are published by the APVMA.

For each chemical/food crop/animal combination, a maximum residue level (MRL) is established. The MRL is the maximum level of the chemical permitted to be present on a crop or animal product at the time of harvest or slaughter.

In establishing a MRL for a chemical, data from studies of adverse effects on animals and residue trials using the chemical in the manner proposed, are used to set an acceptable daily intake (ADI) for the chemical. The procedures used are in accordance with those agreed internationally.

The ADI is the daily intake of the chemical which, after a lifetime of exposure at that level, should not result in adverse health effects. The MRL is always below the ADI with allowances being made for use of the chemical in a variety of situations.

Residue levels above the MRL are an indication of incorrect chemical use. An excessive residue level in produce can affect both the domestic and overseas markets and can lead to rejection of produce and long term damage to agricultural markets.

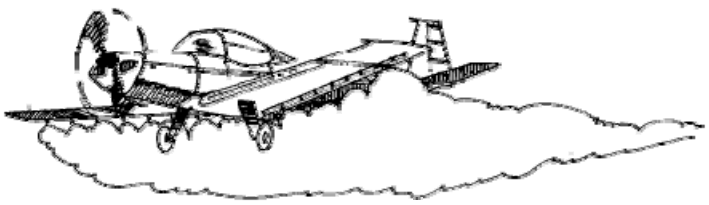
9.2 Withholding periods

Withholding periods are the recommended minimum time span which must be allowed between the last application of a chemical and the harvest of the produce or slaughter of animals. Observing withholding periods is a means of reducing the risk to health from consumption of, or contact with, treated produce. The periods are based on the rate of degradation of the particular chemical under normal conditions when the product has been applied according to instructions.

Withholding periods are clearly shown on agvet chemical labels and should be observed at all times.

9.3 Spray drift risks

Spray drift risks are associated with chemical spray, which may drift over adjacent properties and create risks to health. The most effective way to manage these risks is to eliminate the drift.



Nature and extent of spray drift risks

Any exposure from spray drift to people on adjacent properties is usually of limited duration and limited to the application strength of the chemical, i.e. considerably more diluted than the purchased concentrate.

Example of managing spray drift
A producer has land next to a school and decides for economic reasons to use that land for small crops. Realising that some pesticides will be needed for these crops, one of the control measures possible from the risk assessment is a line of quick growing native trees that can act as a buffer. It is also noted that even when the trees are fully grown, they will offer only limited protection. The school is on reticulated water, so potential contamination of the water supply is not an issue in this case.

While the trees are small, it is decided that a crop will be produced that requires a minimum of pesticide applications. It is decided that applications will not occur during school hours and all the workers are informed. Application records regarding rates, times, equipment calibration, wind direction and product used, are retained.

Managing the concerns of others
It is important to work cooperatively with the rural community to inform them about the risks of spray drift and how it will be controlled. Producers can work with farm groups and producer organisations to communicate with the public to explain the producer's interest and how the risks will be managed.

Notifying neighbours
Where possible, neighbours who may be affected by the spraying of chemicals should be notified either by letter or telephone before the application. The details of this notification should be negotiated between the producer and their neighbours.

Vegetation barriers
As part of long term planning, the ability to have distance or a barrier between the application site and the area of potential risk will reduce that risk.

Formulations
While the chemical formulations chosen must give adequate and effective control, some formulations may assist in reducing spray drift. Label instructions should be followed at all times.

Some formulations are more volatile than others and more likely to give rise to drift due to volatilisation following application. Low volatile formulations are preferable in areas where sensitive crops are grown nearby, or where elevated temperatures may occur after spraying.

Equipment
Equipment that is designed with mechanisms to reduce or eliminate drift should be chosen where possible, such as equipment with characteristics that produce a nearly uniform droplet size.

Equipment should be used in accordance with the manufacturer's instructions and be chosen for the particular chemical and target requirements.

Spray volume should be controlled by changing nozzles and **not** by varying pressure. A higher pressure generally forms a finer spray that may drift excessively.

Droplet drift before the chemical hits the target is reduced if the release height is as low as possible. However, if the release height is too low it may be difficult to obtain a uniform spray pattern.

Non-drip valves and recirculating systems should be used where possible. Pressure gauges should be maintained and functional and producers should ensure that the spray rig is calibrated accurately and frequently.

Operational procedure

Ensure that spraying is done in crosswind conditions rather than directly into or with the breeze. Spraying should only take place when the breeze is blowing away from an area that may be at risk from drift. Wherever possible, a buffer zone should be left between a sprayed and unsprayed area.

If conditions are not suitable to minimise potential risks from drift, the spray operation should be delayed.

Technologically superior spraying equipment, such as a low drift or air induction nozzle, may allow spraying to occur in a wider range of meteorological conditions without creating a drift hazard.

Weather conditions

In most chemical application operations, it is possible to undertake spraying when conditions are least likely to cause drift. Spraying should be done in a light, steady breeze.

Ideally, relative humidity should be high and temperature not greater than recommended. Producers should be aware of weather conditions such as an inversion when spraying. Application should be avoided in calm, stable conditions that may occur early in the morning or late in the afternoon.

Summary — control measures for off-site risks

To reduce the risk of excessive spray drift, producers should:

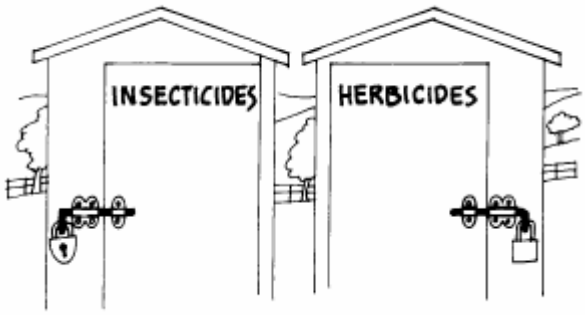
- check the wind direction and speed before spraying to ensure that drift is not carried into populated areas
- check the time of day to ensure that sensitive neighbours are not present (e.g. schools)
- ensure that all equipment is working effectively:
  - all nozzles are clear and spraying uniformly
  - pressure is according to specification
  - height above the target is correct and maintained
  - specified or appropriately selected nozzles are used
  - droplet size is in desired range, or in accordance with the label.

10 Chemical storage and transport

It is unlikely that any person, property or the environment will be affected when chemicals are stored in sealed containers that remain intact. The risks associated with storage relate to emergencies, such as fires, spills, accidental inhalation or ingestion. While these incidents may not occur very often, when they do, the outcome can considerably affect the workplace.

While the probability of an incident occurring is very low, the consequences can be considerable and the exposure of any person close to the incident can be high. Low frequency to severe outcome risks should be addressed by taking steps that reduce the likelihood of an incident occurring and establishing emergency procedures to reduce the severity of any incident.

There are many inexpensive control measures that can be implemented immediately and others that can be considered as part of longer term planning.



An example of managing storage

An insecticide is purchased and brought onto a property. The label states that it is toxic especially when ingested. It should be separated from herbicides and stored in a cool, well-ventilated space.

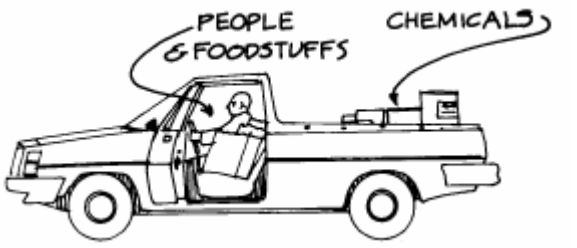
The producer has a shed that is suitable for storage of chemicals and can be made secure. The insecticide is stored in a clearly defined and separate area from the herbicides and the shed is locked to prevent unauthorised access.

As a result of the risk assessment, it is noted that the major risk factors are the toxicity (possible consequence) and the need for separation and security (probability of an adverse outcome). In this case, all factors can be reduced with minimum cost and effort.

10.1 Transport and the ADG code

Many chemicals used in rural workplaces are classified as dangerous goods. In transporting these goods, conditions apply when the quantity of chemicals transported is above the exemption limits set out in s7 of the *Transport Operations (Road Use Management — Dangerous Goods) Regulation 2008*. These conditions include:

- separation of incompatible substances
- signs and equipment for the vehicle
- dangerous goods licensing for the driver (includes training for emergency action).



UTE IT – DON'T BOOT IT

Other issues include the:

- availability of emergency information
- assessment of container condition.

The strict requirements will not apply to the transportation of chemicals by a producer to their property, provided the quantities are low (generally <500 kg or l), however lower limits apply when including Class 2.1 (e.g. LPG) and some packaging groups. Large operations should comply with all requirements or have an appropriate carrier undertake the transportation.

The requirements in the *Transport Operations (Road Use Management — Dangerous Goods) Regulation 2008* and the ADG Code should be considered as part of good management for the transport of chemicals, especially those classified as Packaging Group 1 (ADG Code) and Schedule 7 (SUSDP). There are considerable risks when chemicals, people and foodstuffs are transported together in a vehicle such as a station wagon.

10.2 Reducing incident probability and consequences

Reducing the quantity of chemicals stored at a workplace is one of the most cost effective ways of reducing risk. As a rule, no more than one season's chemical requirements should be stored, as many chemicals have a specified shelf life and do not retain their efficiency beyond that date.

Reducing the quantity stored is an important control measure.

10.2.1 Design of storage

When carrying out a risk assessment for storing chemicals, producers should consider the:

- quantity of product to be stored
- duration of storage
- characteristics of the chemicals, i.e. toxicity and stability.

The store should be designed and built for medium to long term storage of chemicals. When designing the store, factors such as emergencies, spill control and flammability resistance should also be considered. Most requirements would be met by a secure separate building with:

- roof ventilation
- concrete floors
- concrete door sills
- concrete block walls.

A separate building may not be required when small quantities of chemicals are stored for short periods. However, in these situations, mitigation, isolation of spills and emergency procedures must be considered.

Good natural ventilation should be provided and chemicals should be stored at as low a temperature as possible to prevent product deterioration. The products should be protected from moisture so that packaging does not deteriorate. Special attention should be given to any cardboard containers.

Herbicides should be stored separately from insecticides, fungicides and other chemicals to avoid confusion in use and contamination of equipment. Solids should be stored away from liquids.

10.2.2 Location, security and access to storage

Many chemicals are scheduled poisons and safety is the most important consideration in choosing a storage area. Some products have specific storage requirements clearly marked on the label which must be followed.

The store should be in a location separate from other buildings, dwellings or workplaces to minimise risk, and:

- accidental or unauthorised access to the storage area
- risks to children and visitors not familiar with the hazards of chemicals
- be kept locked with a childproof latch fitted.

The store should not be located in flood prone areas or near potential water courses and the likely destination of any water and residues from fire fighting should be considered when planning a site.

10.2.3 Separation distance from work or living areas

While a suitable location should reduce the probability of an incident occurring, locating the store remote from major work or living areas significantly reduces exposure if an incident does occur.

Airborne material from a spill or fire may be rapidly diluted, depending on weather conditions and the time of day. A small increase in distance from the source may lead to a significant reduction in exposure.

10.2.4 Containers of stored chemicals

In all stores, containers should be regularly assessed for risks to safety and containers that are leaking or corroded should be secured or removed. Old stock should always be used first.

10.3 Action after assessing storage facilities

After assessing the risks of storage of chemicals in the workplace, producers should:

- address any high risk areas/situations as soon as practicable
- establish emergency procedures or review existing procedures
- improve the quality of storage areas where possible
- make mid- to long-term plans for the construction of future storage areas where required.

10.4 Contents of a storage assessment record

Assessment records of storage facilities should show how all the risk factors have been addressed. A single site assessment record should be adequate for the whole workplace (see Appendix 1).

10.5 The role of AS 2507

AS 2507 – The storage and handling of agricultural and veterinary chemicals applies to the storage of pesticides, whether open or covered, in depots, warehouses and stores. Although intended to include the on-farm storage situation, some of the provisions contained in this standard may not be appropriate to small-scale/on-property storage.

10.6 Bunding

A bund is an embankment or wall forming a perimeter around stored chemicals. Smaller bunds may be used for individual containers; larger bunds for a combination of chemicals that are compatible. For large stores, the size, shape and nature of the bund are specified in standards or regulations. A bund prevents the spread of spillage and eliminates or reduces any potential problems such as the risk of fire or the spread of toxic and/or land contaminating material.

Bund materials
A bund should be made of a material that will not react with the stored liquid. A common form of bund is a concrete floor, with a lip formed at the edges or with a wall of preformed blocks. There is little value in painting or sealing such a bund as some solvents will destroy the painted surface in the event of a spill. A concrete bund should have:

- a smooth surface finish
- adequate reinforcement to eliminate/reduce cracking or separation of any block wall.

Additional containment measures
To further minimise the spread of spillage, additional containment measures can be used with minimal expense and effort, such as:

- a plastic bag around a small bottle
- small containers stored in a cut-down plastic or steel drum
- a sheet metal tray with or without a plastic liner
- a sheet metal tray with absorbent material
- sheet plastic over an earth bund or block wall[3].

In any store, a regular inspection program will identify deteriorating labels or containers. Action should be taken to ensure that a small event does not become a more serious problem in the future.

[3] Plastic sheeting alone is better than nothing in the short term but is easily punctured.

11 Emergency planning and procedures

11.1 Emergency procedures

For any store, emergency procedures should be in place. Placarding is a statutory requirement where storage quantities exceed certain limits. The limits are unlikely to be exceeded on most properties. However, properties with large quantities of chemicals stored may need to be placarded (see s77 of the *Dangerous Goods Safety Management Regulation 2001)*.

The label and MSDS should be used as a guide when planning emergency procedures because they contain the necessary information required in case of an incident. Supplementary information, provided by a manufacturer or supplier, could also form part of the planning for emergency procedures.

Where chemicals are inundated by a flood, all downstream neighbours should be immediately notified and every effort must be made to recover chemical containers and to determine the amount lost. Personal protective clothing should be worn by anyone involved in recovery operations.

Some chemical products are flammable. Details of fire procedures are in the MSDS. If people from outside the workplace are likely to be involved in an emergency control situation, it is important that they are fully informed of the nature of the products involved and their quantities. Where emergency services are not available, sometimes leaving the fire to burn may need to be considered.

The contact number for the **Poisons Information Centre** should be displayed at the telephone nearest to the store.

11.2 Emergency equipment and training

Emergency equipment

Providing emergency equipment is an essential part in establishing emergency procedures. The label and MSDS should provide information on the equipment required. To control chemical fires, fire retardant foam should be used in preference to water jets.

Training for emergencies

Training for emergencies ranges from evacuation procedures to fire fighting. The extent of the emergency duties should relate to the protection of human life and initial measures to re-establish control.

11.3 Clean-up procedures

Clean-up procedures for a chemical are usually documented on the label and contained in the MSDS. These procedures should be followed in the case of a spill and all necessary materials, usually lime, sand and any commercially available absorbents, should be on hand.

Clean-up procedures used after a fire cannot be easily documented as the residue is usually an unknown mixture. All care should be taken and external advice sought.

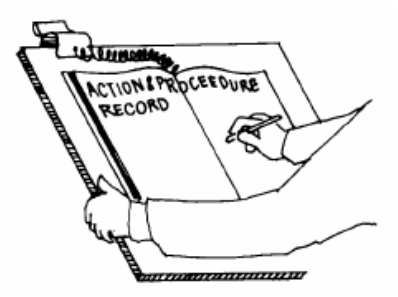
Anyone involved in the emergency should shower and wash all clothes separately from other washing.

All fire fighting equipment and any remaining material should be de-contaminated with lime or hypochlorite bleach depending on the chemicals involved and then washed with soap and water.

The integrity of any containers surviving a fire should be checked to ensure that no further risks, such as slow leaks, are likely. Also, the supplier should be contacted to find out the effect of heat on the chemical.

12 Records

Records are a useful way of keeping information about events that take place relating to chemicals.



Record keeping is part of good management for all activities in the workplace including recording the use and application of chemicals. Good records are a valuable reference in case of incident, or when an illness is reported, to show that correct procedures were developed and followed for the storage and use of chemicals in the workplace.

12.1 What records should be kept?

Accurate records should be kept of all aspects related to the assessment and control of the risks from the storage and use of chemicals. This is particularly important where long term (chronic) health effects are known or detailed in the MSDS. Records should include:

- information on the chemical products including a list of chemicals, labels and MSDSs, any emergency procedure guides (EPGs) and safe storage guides
- risk assessment outcomes and actions including training programs for emergencies, use, application and the wearing of protective equipment
- details of application procedures including:
  - date of application and start/finish times
  - site of application including block/paddock identifier
  - area, crop and pest treated
  - product and quantity used
  - dilution and rate per hectare of agricultural chemical applied
  - dilution and rate of veterinary chemical applied
  - equipment and operating details
  - weather conditions, including wind direction and speed.
- any health surveillance undertaken.

12.2 Form of records

Records should be made on prepared forms so that they can be completed easily and kept in a convenient location that can be easily accessed and understood by everyone at the workplace.

For most properties, records should be restricted to a limited number of forms. Other than externally supplied/obtained information such as a MSDS and health surveillance reports, two records are recommended to cover most aspects of chemical management. They are:

- **A site assessment record** covering:
  - training
  - storage
  - facilities for mixing and disposal
  - any requirements for health surveillance.

The record would only require review at reasonable intervals such as yearly or when a new chemical is introduced or a work practice is changed. This is an easy way to record any assessment for occupational exposure (see Appendix 1).

- **A record of chemical usage form** that should:
  - be filled in every time a chemical is used on a property
  - detail the application rates
  - name the person who applied the chemical

- be an appropriate way to record the assessment of spray drift risks.

Note: this is an example of a task-based assessment (see Appendix 2).

The form or record should be kept for any extraordinary event such as a fire or chemical spill. Details of clean-up, disposal and associated issues should be recorded.

12.3 Location and access of records

Because of fire risks, records of the chemicals stored should be located at some point other than the place where the chemicals are stored. However, a MSDS and other records should be readily accessible to anyone required to handle chemicals.

The storage method of the records should consider:

- the size, complexity and physical location of the workplace
- the number of substances stored and used in the workplace
- the number of workers.

12.4 Record retention periods

Records will be useful in the event a worker or other person is injured as a result of chemical exposure, and the producer is asked to show what action had been taken, or what instructions had been given regarding a worker's use of chemicals. Where a producer is subject to court action, the records of how chemicals were managed may assist in defending the action. Also, records may be critical in diagnosing any health effects suffered by the producer, their workers, family members and others.

Information on a chemical should be kept and updated at the workplace while that chemical remains in use.

Application procedure records should be maintained for at least five years.

The risk assessment outcome and action records should be maintained until they are updated.

Health surveillance records should be kept for 30 years because some health effects, such as cancers, may take a long time to become evident. If a business ceases to trade or is sold, any health surveillance records should be offered to Workplace Health and Safety Queensland for storage.

13 Unwanted rural chemicals

Many unwanted chemicals may have accumulated in the community, in particular on rural properties. The safe management of these surplus chemicals is a concern for all property owners or managers, in particular recent purchasers who may have limited information about the chemicals present on the property.

This accumulation of unwanted chemicals may result from:

- the discontinued use of a chemical because of changes in cropping
- the development of newer and safer chemicals
- changes in registration requirements and/or banning from use.

These chemicals cannot be sold without a licence for resale and may have to be stored on farms for a considerable period of time until disposal is organised.

This section provides general advice on the safe storage of unwanted farm chemicals to minimise the risks of a spill or fire or harm to people, property or the environment. A checklist of points to consider is provided in Appendix 6.

13.1 Packaging and maintenance of packaging

If containers are sealed and maintained in good condition, chemicals pose little or no immediate risk to people, property or the environment. A regular inspection program to examine stored items can help to reduce problems such as leaking or inadequately sealed containers.

Lids should be fitted to all containers to minimise spillage and handling risks. The containers used should be impervious to, and should not react with, their contents. Containers previously used for storing foodstuffs and labelled as such, should not be used under any circumstances for storing chemicals.

Most chemicals will be in liquid form. The liquid will usually be an active agent in a solution of water or a flammable/combustible organic compound. Containers for liquid chemicals are usually made of plated steel or plastic (or occasionally glass) materials. Leaking containers of liquid chemicals should generally be placed in oversize containers (ideally made of the same material). Label information should be maintained as far as possible.

Chemicals in solid form may be powders or granules for direct application or for making into solutions. Some solids may release poisonous gases on mixing with water or moisture in the air, especially where packages have deteriorated. For example, sodium cyanide in a termite-eaten wooden box could release hydrogen cyanide (a poisonous gas). These solids should be stored in sealed containers.

Gases, including aerosols, are normally kept in pressure containers either as a compressed gas or as a very volatile liquid. Gas cylinders, particularly old rusty ones, can rupture at any time without warning and release large volumes of gas.

Special care must be taken with any unknown solids or gas cylinders. A solid in a deteriorating plastic bag should be placed in an additional clear plastic bag. Where there are obvious signs of high risk (odours, surface reactions on solids or deteriorated cylinders), the chemical should be removed by professional chemical/hazardous waste manager.

13.2 Maintenance of information

It is important to maintain the information available from sources, such as product label and MSDS, when managing unused farm chemicals.

Where possible, labels should be protected from deterioration by avoiding exposure to moisture and sunlight. Even if some deterioration has occurred, the label from the original container must be kept. Limited amounts of product information are better than none.

A back-up system, in the event of label deterioration, is recommended. A suggested system involves:

- making a permanent unique identifying mark on each container
- copying the label information into a record book or card against that unique identifying mark (include safety directions, first aid methods and warnings).

Permanent markers

Permanently marking a container, especially a rusty metal tin without a carrying handle, can be a challenge. Some ways of making identifying marks/labels are:

- using paint on the container
- writing with a permanent felt pen on plastic containers
- making a soft metal tag (e.g. cut from a drink can), wiring it on and marking with a sharp metal object such as a nail
- wiring on a plastic tag and marking it with a felt pen.

Recording label and other information

As much information about a chemical should be recorded as other people may know the chemicals commonly used at the time and combined with the limited label information, may help to determine the nature of the contents.

The following sample record sheet is a record based on three containers, all with labels that may have deteriorated to varying degrees.

In the case of the chemical arsenic, it is important to record the chemical form of the material or the complete chemical name because different forms of the chemical may require different processes for recovery or disposal (e.g. the chemical form is arsenic trioxide).

Information on active and other ingredients should be provided, where available. For example, the product chlordane contains a flammable solvent, a substance which may affect safety and subsequent processing.

Special precautions may need to be taken about fire risks if a large quantity of similar chemicals is stored at a later stage.

Sample record sheet

UNUSED FARM CHEMICALS

Property of:.....

Address.....

Container Number	Details
XYZ 1	...Arsenic Trioxide... UN No 1561 .....(manufacturer) ... (trade name) ...
XYZ 2	... Chlordane.... other ingredients - flammable solvent ...
XYZ 3	powder.. knew previous owner used it for spraying fruit trees here in the late 60s...

If the MSDS is available, the system described in 13.2 can still be followed. Alternatively, as the MSDS should contain all required information, the following action should be taken:

- make a permanent unique identifying mark on each container
- transfer the identifying mark(s) to a copy of the appropriate MSDS.

There is now a permanent and unique identifier on each container which is linked to a complete copy of the label (or MSDS) in the records. This is less likely to deteriorate.

13.3 Mixing unwanted chemicals

Generally, unwanted chemicals should not be mixed, even with what appears to be the same product. The solvents used in each chemical compound may differ and may react with each other. Mixing unknown chemicals presents a risk to people, property and the environment. In an extreme case, mixing of incompatible chemicals can lead to violent reactions, such as a fire, explosion, spatter of hot materials, or a release of chlorine or ammonia gas.

Identical chemicals should only be mixed if absolutely necessary, i.e. if a container is leaking or in poor condition.

Note: Mixing chemicals poses a risk of exposure to anyone involved in the process and also presents the problem of disposing of the decanted container.

13.4 Storing unwanted chemicals

The compatibility of chemicals is a major consideration in storage. The *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG code) contains incompatibility charts for dangerous goods. Incompatibilities are also often listed in the MSDS. Any unknown chemical should be treated as if it were incompatible with every other chemical in the store.

Special care should be taken with flammable materials. A torch or match should not be used to read the labels. The spark from switching on a torch can ignite a flammable atmosphere. The heat from a bulb broken while switched on can also ignite a flammable atmosphere.

Essential storage conditions

The land surrounding the storage site should be cleared of vegetation and rubbish to minimise the risk of fire. The storage area itself should be separated from people and water courses and above flood height. The store should have:

- good security to prevent unauthorised access
- good access and easy exit
- easy access to emergency equipment (e.g. fire extinguishers, personal protective equipment, spill kit)
- adequate space for racks to allow for the separation of incompatible chemicals (foodstuffs, seed and fertilisers should be kept in a separate store)
- an interior protected from direct sunlight
- appropriate shelving arrangements to minimise breakage (e.g. storing glass containers at low level or floor level)
- in the case of liquids, a bund (an embankment or wall around chemicals to contain potential leaks or spills).

Desirable storage conditions

Where possible, the store should also be:

- adequately supplied with water for washing
- separate (isolated) from living areas and other work areas or at least have a substantial dividing wall
- constructed of non-combustible materials
- able to contain spilt liquid and easily cleaned (e.g. a concrete floor with a slight slope to one corner and/or with a sump) which will prevent contamination of water courses when spills occur
- fitted with shelves and linings constructed of non-absorbent materials and able to be readily cleaned (preferably steel shelves, or sheet metal or mesh)
- equipped with a thermally insulated roof and good natural ventilation (weatherproof ventilation at the lower level and near the roof)
- equipped with flameproof electrical equipment (or the electrical service removed as a cheaper alternative) if flammable materials are stored.

Appendices

Appendix 1 – Chemical site assessment record

Please print and complete this form to conduct a safety assessment regarding the use and storage of rural chemicals at the workplace.

1. Training		
Has training been provided to all users of rural chemicals?	☐Yes ☐No	
What type of training?	_____ _____	
Accreditation certificate numbers		
Any other certificate/training?		
2. Storage		
Types of chemicals held, and maximum amount of these chemicals held for more than 48 hours at any one time?		
Chemical maximum quantity	kg or L	
MSDS held?	☐Yes ☐No	
Where are the MSDSs held?		
How is the chemical store made secure from accidental access?	☐locks ☐childproof gates ☐other _____	
Are the chemicals protected from moisture?	☐Yes ☐No	
Are herbicides separated from insecticides and fungicides?	☐Yes ☐No	
How are spills controlled in the storage area?	☐earth bunds ☐concrete sill ☐other _____	
If spills occur, what equipment is available to clean-up?	☐lime ☐sand ☐adsorbent ☐other _____	
Is the storage area resistant to fire?	☐Yes ☐No	
What fire fighting equipment is available?		
What training have workers received in emergency procedures?		
3. Mixing and preparation		
Is all mixing and preparation of chemicals done in a specific site?	☐Yes ☐No	
What provisions are there for spillage control at mixing site?		
What PPE is used when mixing chemicals?	☐ apron ☐ gloves ☐ face mask ☐ goggles ☐ overalls	☐ respirator half ☐ respirator full ☐ impervious boots ☐ ventilation ☐_____
Is mixing carried out with another operator present or within shouting distance?	☐Yes ☐No	
Is water available for personal washing?	☐Yes ☐No	
4. Disposal		
What procedures are used to dispose of excess chemicals?		
What procedures are used to dispose of chemical containers?		

Assessor signature: _____ Employer signature: _____

Appendix 2 – Record of chemical usage form

Have you read the label? ☐ Yes ☐ No

Use one sheet per job

Date and time	**Block No(s) / Paddock**	**Weed or pest**	**Pest incidence** (species per m^2)	**Chemical used**	**Total quantity** (L or kg)	**Application rate**	**Wind direction**	**Wind speed**	**Temperatu re**	**Remarks** (e.g. date neighbour notified)

Application method (tick)	**Nozzle type**	**Last calibration date***	**Operating pressure**	**Protective equipment**	(to be filled in later)
☐ boom ☐ knapsack ☐ air blast ☐ CDA ☐ aerial ☐ other (specify) ____________________		* Boom spray		☐ apron ☐ gloves ☐ face mask ☐ goggles ☐ respirator (half) ☐ respirator (full) ☐ overalls ☐ impervious boots ☐ tractor cab (filtered air) ☐ other (specify) ____________________ ____________________ ____________________	**Effect on pest population** **Effects off-target** (plants, streams, wildlife, etc.)

Chemical application by: ____

Appendix 3 – Example inventory record form

List of chemicals

(Keep with MSDS to form a register)

Person applying chemical (name): ____________

Company: ____________

Workplace: ____________

Date: ____________

Name of chemical	Location of chemical	Current MSDS? (Yes /	Hazardous substance? (Yes / No)	Dangerous good? (Yes / No)	Labelled ? (Yes /	Uses	Comments

Appendix 4 – Example risk assessment record form

Work unit (job):		Person's name(s):		Assessment team:	
Work area:		Date:		Time:	
Summary of process:					
Chemical	**Hazard information**	**Task**	**Exposure routes**	**Assessment/findings**	**Comments and/or controls**
Controls in place:					
Assessment result and recommendations:					
Assessor signature: ______________ Date: ______					
Approved by (name): ______________ Assessor signature: ______________ Date:					

Appendix 5 – Chemical exposure risk assessment checklist

Use this checklist as a basis for conducting a chemical exposure risk assessment:

Step 1 Have you decided who will do it?	☐Yes ☐No
Step 2 Have you divided the work into units and listed the work tasks?	☐Yes ☐No
Step 3 Have all substances been identified? • Have you determined which are hazardous and/or dangerous? (If there are no hazardous substances or dangerous goods, no further action is required apart from recording this). • Has the register been compiled?	☐Yes ☐No ☐Yes ☐No ☐Yes ☐No
Step 4 Have you examined the MSDS and other sources of information on health effects?	☐Yes ☐No
Step 5 Has exposure been identified in each work task? For each hazardous substance find out: • Is it released or emitted into the work area? _____ • Who is exposed? _____ • How much are persons exposed? _____ • What controls are proposed? _____	☐Yes ☐No
Step 6 – What are the conclusions about risk – is it simple and obvious? If "yes", go to the record step 8 below, if "no" decide if: • risks are not significant • risks are significant but controlled • risks significant and not adequately controlled • risks are uncertain	☐Yes ☐No ☐ ☐ ☐ ☐
Step 7 – Have actions resulting from conclusions been identified? • no further action required? • seek expert help? • introduce control measures? • induction and training required? • monitoring required? • health surveillance required? • emergency procedures and first aid required?	 ☐Yes ☐No ☐Yes ☐No ☐Yes ☐No ☐Yes ☐No ☐Yes ☐No ☐Yes ☐No ☐Yes ☐No
Step 8 – Has the assessment been recorded? • on the MSDS in the register? • on a record form?	 ☐Yes ☐No ☐Yes ☐No

Appendix 6 – Unwanted chemicals storage checklist

When storing unwanted chemicals, do the following:

- ☐ plan a regular inspection program to ensure containers are in a good sealed condition
- ☐ deal with leaking containers (e.g. by placing in suitable oversize containers)
- ☐ arrange for chemicals displaying signs of high risk to be removed by professional chemical/hazardous waste managers
- ☐ protect labels from deterioration where possible (e.g. avoid sun or moisture exposure)
- ☐ implement a back-up system for labelling which records as much information on the product as possible
- ☐ establish suitable storage conditions which take into account:
  - compatibility of chemicals
  - security
  - ease of access and exit
  - adequacy of shelving space
  - protection from direct sunlight
  - minimisation of breakage
  - containment of leaks or spills
  - appropriateness of construction materials
  - ventilation
  - flame-proofing.
- ☐ provide appropriate bunding where necessary
- ☐ develop emergency procedures to deal with a fire or spill
- ☐ provide adequate and easily accessible emergency equipment
- ☐ develop training in emergency procedures and the use of emergency equipment
- ☐ develop clean-up procedures in case of spillage or a fire
- ☐ study the relevant health hazard information contained in material safety data sheets.

Appendix 7 – Case study: Risk management using task analysis

The hazard
Often chemicals are decanted and diluted. A farmer is examining the filling of a tank with pesticide. The MSDS or label indicates that the product should not contact the skin or eyes, and that impervious gloves and a face shield should be worn.

Assessing the risk
An inspection of the workplace reveals that the normal procedure is to stand on the ground and lift the container of liquid concentrate above head height and pour the contents into a tank on the application equipment. This procedure is adopted for convenience but has the risk of spillage, ingestion and contamination of the worker's clothing. However, it is possible to climb onto a stable and adequately guarded access platform on the rig and pour the concentrate at waist height. Alternatively, the use of a probe and pump would reduce the risk of exposure as well as reducing manual handling risks.

Thus, the assessment of this task is complete. It has been recognised that a potential risk exists and that performing this task without wearing appropriate personal protective equipment (PPE) could lead to a problem. Also, it has been noted that the old method of work may lead to an incident where the concentrate is spilt over the worker.

The solution
The outcome of the risk assessment is that:

- PPE must be worn for the job
- the concentrate must be added to the tank either from the access platform and not from the ground, or by the use of a probe and pump.

This has been noted on the MSDS, which is kept in the register, and kept as a record. The required controls can be easily applied.

Appendix 8 – Dangerous goods class labels

1.1, 1.2, 1.3	EXPLOSIVES	
1.4	Substances and articles which present no particular hazard	
1.5	Very insensitive substances which have a mass explosion hazard	
1.6	Extremely insensitive articles which do not have a mass explosion hazard	
2.1	FLAMMABLE GASES	
2.2	NON-FLAMMABLE NON-TOXIC GASES	
2.2 Sub-risk 5.1	OXIDISING GAS (Oxygen and Nitrous Oxide - only for road or rail transport or for storage in Australia)	

2.3	TOXIC GASES	
3	FLAMMABLE LIQUIDS	
4.1	FLAMMABLE SOLIDS	
4.2	SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION	
4.3	SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES	
5.1	OXIDIZING SUBSTANCES	

5.2	New Label, ORGANIC PEROXIDES	
	Old Label (not permissible after 1 January 2011)	
6.1	TOXIC SUBSTANCES	
6.2	INFECTIOUS SUBSTANCES	
7	RADIOACTIVE MATERIAL (Category I)	
	RADIOACTIVE MATERIAL (Category II or III)	

7 Cont	FISSILE MATERIAL	
8	CORROSIVE SUBSTANCES	
9	MISCELLANEOUS DANGEROUS SUBSTANCES & ARTICLES	
	MIXED CLASSES (for road or rail transport or for storage in Australia)	
	ELEVATED TEMPERATURE SUBSTANCES	
	ENVIRONMENTALLY HAZARDOUS SUBSTANCES	

Appendix 9 – Publications and information

Queensland (and Commonwealth) legislation regarding rural chemicals

- *Agricultural and Veterinary Chemicals Act 1994* (Cwth)
- *Agricultural and Veterinary Chemicals (Administration) Act 1992* (Cwth)
- *Agricultural and Veterinary Chemicals Code Act 1994* (Cwth)
- *Agricultural and Veterinary Chemicals (Queensland) Act 1994*
- *Agricultural Chemicals Distribution Control Act 1966*
- *Agricultural Chemical Distribution Control Regulation 1998*
- *Agricultural Standards Act 1994*
- *Agricultural Standards Regulation 1997*
- *Chemical Usage (Agricultural and Veterinary) Control Act 1988*
- *Chemical Usage (Agricultural and Veterinary) Control Regulation 1999*
- *Dangerous Goods Safety Management Act 2001*
- *Dangerous Goods Safety Management Regulation 2001*
- *Environmental Protection Act 1994*
- *Environmental Protection Regulation 2008*
- *Environmental Protection (Waste Management) Policy 2000*
- *Environmental Protection (Waste Management) Regulation 2000*
- *Environmental Protection (Water) Policy 1997*
- *Hazardous Substances Code of Practice 2003*
- *Health Act 1937*
- *Health (Drugs and Poisons) Regulation 1996*
- *Standard for the Uniform Scheduling of Drugs and Poisons* (Cwth)
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Operations (Road Use Management—Dangerous Goods) Regulation 2008*
- *Workplace Health and Safety Act 1995*
- *Workplace Health and Safety Regulation 2008*

Australian Standards

If large quantities of chemicals are stored, the following standard contains additional advice:

- *AS/NZS 2507 – The storage and handling of agricultural and veterinary chemicals*

Guidance

- *Agricultural chemical users' manual* (guidelines and principles for responsible agricultural chemical use)
- *ChemCert Safe Use of Pesticides for Plant and Animal Health - Learning Guide 2009*