



## FARM SAFETY

Jim Sullivan and Peter Allsopp

**WORKING in the sugarcane industry can be a hazardous occupation. Rural industries have the third highest rate of fatal incidents each year, and more than 200 fatal work-related accidents occurred on farms during the 1990s. There are many common causes: 27% were caused by tractors, 14% by other vehicles, 20% involved water or electricity, and 7% involved workshops, unguarded machinery or windmills. For every fatal injury, several serious non-fatal injuries occur, which affect a person's ability to work.**

There are potential risks from the machinery and equipment used, the materials handled, how the process is undertaken, and the environment in which the work is carried out. Accidents at work cause personal hardship and financial losses by disrupting primary production. Their effects can be very long lasting.

The *Workplace Health and Safety Act 1995* applies to every workplace in Queensland, including cane farms (similar legislation exists in other States). Under the Act, an employer has an obligation to provide a safe, healthy working environment, safe equipment, and training and supervision. Everyone who enters a rural workplace, whether as a full-time or casual worker or just

a visitor, has the right to be protected from any hazards that exist. Workers have an obligation to comply with the instructions given for workplace health and safety by the employer. Workers must also use personal protective equipment, if the equipment is provided by the employer and the worker is properly instructed in its use.

### INDUCTION OF WORKERS

One very important way of reducing the likelihood of accident and injury is through training. Instructing and training workers, particularly induction training for new workers, is an important first step in establishing the right attitude towards work.

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Discussing health and safety with workers applies equally to new workers and to those undertaking new tasks.

Induction provides workers with the information needed to function safely and effectively on the job. The *Rural Workers' Guide* and the *Cane Farm Workers' Guide* (published by the Queensland Division of Workplace Health and Safety) provide economical and effective means of delivering the safety message. They assist employers to provide induction training and appropriate safety reference material.

Employers should keep a record of induction training provided to workers. The guides mentioned above have tear-out sections where information on each worker can be recorded and retained by the employer. However, a diary entry containing the details of training and the name of the worker is adequate to record induction and any additional training provided to workers.

### EMPLOYERS' RESPONSIBILITIES

The *Workplace Health and Safety Act* requires employers to encourage their workers to act responsibly in health and safety matters by assigning legal obligations to manage injury risk. Employers must maintain work areas, machinery and equipment in a safe condition. Safe systems of work need to be organised and adequate information, supervision, instruction and training need to be provided to workers to enable them to work safely. Employees need to be made aware of potential hazards, e.g. chemical use and storage, and be given adequate protective clothing and equipment where needed. Such equipment includes ear muffs for hearing protection, approved eye protection for welding, and respirators for pesticide application.

Employers need to consult with workers on health and safety matters and ensure that equipment and materials are used, stored and disposed of safely.

### WORKERS' RESPONSIBILITIES

Workers should not put their own health and safety, or that of others, at risk while performing work. This means that they should follow and comply with the employers' instructions given in the best interests of health and safety and act and perform work duties in a responsible and safe manner. They should use, wear and look after personal protective equipment and take reasonable care for the health and safety of others at the workplace.

It is important that all workers inform the employer of any situation that might be hazardous. This includes reporting accidents, near misses and obviously unsafe practices and equipment.

### ACCIDENT REPORTING

Under the *Workplace Health and Safety Act*, employers should keep records where a work-related illness, dangerous occurrence or bodily injury causes death or hospital admission.

Where there is a death, the employer must give immediate notice to the General Manager, Division of Workplace Health and Safety. The accident scene should not be interfered with at all unless it is necessary to prevent further injury or damage.

In the case of injury causing admission to hospital, rural employers must notify the General Manager within 24 hours of the injury or within 24 hours of becoming aware of the work-related injury.

### RISK MANAGEMENT

Risk management allows employers to consider the outcome of an action rather than the circumstances after an event has occurred. It is not necessarily a complex task, and is actually used throughout each day to make decisions about things that people do. Subconsciously, people apply the four steps of risk management in identifying the hazard, in assessing the risk of injury, in controlling

the risk, and in evaluating whether the control has reduced or increased the risk.

For complex hazards, where a number of factors influence the outcome, it may be necessary to consider the issues carefully by putting pen to paper and clarifying the four steps of risk management. Records should be kept of what is done in these circumstances to allow assessment of how good the risk control measures have been. They are also useful as evidence of actions taken to meet workplace health and safety obligations.

### INSTRUCTION

Three levels of information enable employers to determine the training needs of workers to carry out tasks competently and safely. They are what they must know, what they should know and what they could know. The 'must know' aspects of the tasks are of the highest priority. Employers can be selective about the 'should knows', and the 'could knows' are optional. Consideration of these three levels will ensure that induction training is meaningful and relevant.

Any instruction should be practical and, wherever possible, should be carried out by both the instructor and the worker on the actual equipment or in actual locations. Workers should be assessed on their understanding of the task and the main operational and safety aspects summarised and emphasised.

### TRACTOR SAFETY

Any tractor designed or imported into Australia must comply with the relevant Australian Standards or equivalent design criteria. Safety features that are addressed in these standards include roll-over protective structures, falling-object protective structures, guards, protection from noise and exposure to ultraviolet radiation, and measures for operator health and safety, e.g. seat belts. No tractor should be purchased or operated unless these features are fitted. The type and extent of any modifications made to

tractors should fall within the appropriate Standard.

Injuries involving tractors usually occur from rollover, various falling objects and people being pulled into unguarded power takeoffs. Run-overs are primarily linked to three practices: starting a tractor from the ground, carrying passengers on the tractor (usually young children), and attempting to get on or off a moving tractor.

### Maintenance

All people undertaking servicing or maintenance of tractors should follow some simple precautions. Before inspecting or working underneath a tractor, the operator must have alighted, the tractor must not be able to move, and any movable attachments must be lowered to the ground and be safely blocked. All power sources to pulleys should be stopped before belts are removed or replaced. If the wheel track is adjustable, it should be set as wide apart as practicable.

When removing and refitting tractor tyres, the valve core should be removed first, to allow air to escape and to make the tyre more flexible. A good grip should be maintained on the tyre lever and the operator should stand to one side of the tyre when the tube is removed from the rim. When inflating a tyre, a continual check should be made to ensure that the locking ring is properly seated and locked. Always stand to one side of the tyre, and, when large tyres are inflated, an inflation cage should be used. Ballasting of tyres should be done to the manufacturer's recommendations.

### Safety hints

The following matters should be kept in mind when using a tractor. All tractors should be operated in accordance with the manufacturer's instructions. Tractors can usually be started two ways. A machine with a self-starter must be operated from the driving position, and not started from the ground. If the tractor is to be started with a crank, check that the handbrake is on and the vehicle is not in gear. When climbing on or

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dismounting, do so only from a stationary tractor with the transmission in neutral and the handbrake applied.

When driving a tractor, watch for ditches, embankments and depressions, especially where the edges are unstable and are slippery. Gear setting and speed are the critical factors and both should suit the work being carried out. Descend slopes cautiously in low gear and with the widest possible wheel setting. Before turning or applying breaks, reduce speed and, where a differential lock and turning breaks are fitted, ensure that the differential lock is disengaged and the turning brakes are locked together before travelling from site to site. If a tractor is bogged in mud or in a ditch, drive out in reverse gear and place logs and planks only behind the rear wheels.

Implements attached to a tractor can alter the machine's characteristics dramatically. Implements should only be attached to the manufacturer's drawbar three-point linkage or other specified point. Any weight (implement or trailer) applied to the linkage should not interfere with the stability or steering or exceed the manufacturer's specifications. If an attachment becomes blocked, the tractor should be stationary, the drive to the attachment should be disconnected, and the moving parts of the attachment should be stopped before the obstruction is cleared. Before attaching counter weights to increase stability, seek expert technical advice. When using the tractor as a source for stationary power take-off or belt work, apply and lock the parking brake and chock the wheels. Bond the tractor frame to earth to remove the risk from static electricity and operate the tractor only under well-ventilated conditions.

When operating a tractor on roads, use all available warning lights. When parking a tractor, park on even ground, shift the gears to neutral or park, disconnect power sources and secure implements, lower attachments and securely block them, lock the parking brake, stop the engine, and remove the keys.

## SAFETY AND STORAGE OF PESTICIDES

The chemicals used in sugarcane growing are largely herbicides, insecticides, fungicides and nematicides. When correctly used, they can do their job with minimal risk to the user, the sugar consumer or the environment at large. By their nature, pesticides are toxic substances. The information on the top of the label coloured in red tells users how poisonous a substance is. This is the most important piece of information on the label.

### Poison schedules

A quick and useful method of judging the potential hazards of using a chemical is to look at its poison schedule, which is required by law to appear on the product label. Anyone using agricultural chemicals should have a working knowledge of these schedules. Most chemicals used in sugarcane are found in schedules 7, 6 and 5.

**Poison schedule 7 (S7).** These are substances of exceptional danger. S7 chemicals have special precautions to be taken in their use, manufacture and storage. These are high to very high toxicity products, with oral LD<sub>50</sub> values of less than 50 mg/kg.

Label Wording:

**DANGEROUS POISON S7  
NOT TO BE TAKEN  
KEEP OUT OF REACH OF CHILDREN  
READ SAFETY DIRECTIONS BEFORE  
OPENING**

**Poison schedule 6 (S6).** These are substances of a poisonous nature. S6 chemicals must be readily available for domestic, agricultural, horticultural and veterinary use for pest control. LD<sub>50</sub> values are 50–500 mg/kg.

Label Wording:

**POISON  
NOT TO BE TAKEN  
KEEP OUT OF REACH OF CHILDREN  
READ SAFETY DIRECTIONS BEFORE  
OPENING**

**Poison schedule 5 (S5).** These are hazardous chemicals that are available to the public but should be handled, stored and used with caution. LD<sub>50</sub> values are 500-5000 mg/kg.

Label Wording:

**WARNING**

**KEEP OUT OF REACH OF CHILDREN**

### Toxicity of pesticides

The toxicity of a pesticide is the ability of that pesticide to injure or kill. The hazard posed by the use of a pesticide is the chance that injury will result. Although highly toxic chemicals are often more hazardous than less toxic ones, the less toxic chemicals can

present hazards by being used in very concentrated forms, or by being handled improperly or by inexperienced operators. On the other hand, a highly toxic chemical may pose very little hazard if it is used safely. It is important to note that the LD<sub>50</sub> (a method of ranking the relative toxicity of chemicals) does not account for these elements of hazard.

The LD<sub>50</sub> is an estimate of the amount of active ingredient that would be lethal to 50% of individuals in a population. The LD<sub>50</sub> is calculated in milligrams of active ingredient required per kilogram of body weight. In all cases, the lower the LD<sub>50</sub> the more toxic the chemical. Table 1 lists the LD<sub>50</sub> values of

**Table 1.** LD<sub>50</sub> values and poison schedules for chemicals used in sugarcane.

Chemical name	Some registered trade names	Acute oral LD <sub>50</sub> for rats (mg/kg)	Poison schedule
Aldicarb	Temik	0.93	S7
Fenamiphos	Nemacur	15	S7
Mercury	Aretan	22-44	S6
Ethoprophos	Mocap	62	S7
Ioxynil	Actril DS	120	S6
Chlorpyrifos	Lorsban, suSCon Blue	135-163	S6
Heptachlor	Various names	147-220	S6
Paraquat	Gramoxone, Shirquat	150	S7
2,4,5-T	Various names	500	S6
2,4-D	Various names	375-800	S5
MCPA	Various names	700-800	S5
Pendimethalin	Stomp	1050-1250	S5
Prochloraz	Sportak	1600	S5
Hexazinone	Velpar K4	1690	S5
Dicamba	Dicamba, Banvel	1700	S5
MSMA	Daconate 8, MSMA	1738	S5
Ametryn	Viking, Ametrex, Primatol Z	1750	S5
Metolachlor	Primextra	2534	S5
Propiconazole	Cane sett treatment	3046	Exempt
Diuron	Diurex, Karmex	3400	Exempt
Metribuzin	Lexone, Sencor	4000-4753	S5
Fluroxypyr	Starane	5000	Exempt
Atrazine	Gesaprim, Nu-Trazine, Atradex, Atragranz	5100	Exempt
Glyphosate	Glyphosate, Roundup	5400-5600	S5
Asulam	Asulox	8000	Exempt
Trifluralin	Treflan, Tridan	>10 000	Exempt
Some comparisons:	Strychnine	1-30	
	Propoxur	50	
	Aspirin	1750	
	Common salt	3300	
	Ethyl alcohol	13 700	

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some chemicals used in sugarcane in comparison to some household products. Based on the LD<sub>50</sub> values in the Table, the lethal dose of product for a 70 kg person is presented in Table 2.

**Table 2.** Amount of product, which could be fatal if taken orally by a 70 kg person.

Product	Lethal dose
Temik 150G	0.5 mg
Lorsban 500EC	19 mL
Gramoxone W	53 mL
Roundup	1089 mL
Treflan	>1750 mL
Thallium sulfate	448 g (poisoned grain)

### Label

The label on (or attached to) a chemical container is carefully designed to impart enough information for the user to efficiently and safely use the chemical. The label should always be read and understood by the user before the use of the chemical—most importantly, the information should be acted upon. The label should always be used as the practical guide for safe use and storage of chemicals.

### Material safety data sheets (MSDS)

These sheets of information are available at the point of sale of pesticides. They contain information about the hazards associated with particular products in much more detail than the label. There is a comprehensive listing of data for each active ingredient e.g. melting point, ignition point, and particular health risks. Employers need MSDS to make informed decisions on how best to minimise health risks associated with various products. Manufacturer and importer's names are detailed.

Most importantly, MSDS give a 24-hour contact telephone number in case of emergency. All users of pesticides should keep a log of all current MSDSs in an easily accessible point as, when they are needed, it may be in a hurry.

### Safe handling

Extreme care should be taking when mixing and handling chemicals, as this is the period of greatest risk. In particular, take care with concentrates.

### Transport

Foodstuffs and pesticides should be separated during transport. Chemicals should be secured during transport. Pesticides should not be transported in station wagons or in the cabin of a utility.

### Mixing

All users should have a well-thought-out standard procedure for mixing chemicals that minimises risk for the operator, other people (especially children), livestock and the environment generally. It is important to organise the mixing area properly, and have good light, ventilation and adequate water and safety equipment available, away from drains and people. Always read the label and wear correct protective clothing and note dangerous properties and precautions. Avoid the practice of manual lifting of pesticides above waist height and/or climbing on the spray tank during mixing. Many systems are available on modern spray tanks which enable safe mixing at ground level.

### Application

Always read the label and, where applicable, have antidotes available. Understand what is needed to safely apply the product, taking note of any withholding periods and what protective clothes should be worn. Ensure that well-serviced and appropriate filtering material is in place on gas masks and air conditioning units. Begin spraying down wind and move upwind while spraying. Do not contaminate beehives, fishponds, lakes, streams or canals and stay off treated areas for several hours after spraying. Be wary of particularly hazardous spraying operations such as spraying tall cane with small interrow equipment or applying nematicides, which are particularly toxic. Do not walk barefooted

in blocks treated with nematicide for at least 3 months.

### Chemical accreditation courses

All farmers and users of pesticides should attend a chemical accreditation course. In Queensland, it is not compulsory to be accredited but it is strongly recommended. More than 70% of Queensland canegrowers are currently accredited. Some companies run their own accreditation courses for particularly hazardous products, e.g. Aventis for the nematicide Temik. They will only sell the products to individuals who have attended their accreditation course.

### Storage of pesticides

#### READ THE LABEL—HEED THE LABEL

Many pesticides have specific storage requirements stated on the label. In the absence of such statements, the following precautions should be taken.

The storage area should be well ventilated, lockable and identified by signs (see AVCACODE No. 2) and away from water leaks, hose spray and drainage courses. The structure should be designed to contain any spills that might occur, e.g. impervious flood, dwarf walls and doorsills and a disposal pit. (See AVCACODE No. 4), and should be isolated from other buildings. It should be built of fire-resistant materials with fire control equipment (hoses, extinguishers) easily accessible. The stock should be organised so that oldest stock can be used first and regularly inspected for leaky or deteriorating containers. Do not purchase more chemical than can be used within a reasonable period of time and always store them in original, labeled containers.

### Disposal of unwanted pesticides and containers

Unwanted pesticides and used containers represent potential safety and environmental issues. Any unused pesticides that are in original, well-labeled containers should be offered to other farmers who can use them,

or the supplier may accept unopened containers. Pesticides and containers should be disposed of at approved or licensed sites if these are available, or, if unavailable, chemicals should be diluted to spray strength and disposed of in a properly constructed farm disposal pit. (See AVCACODE No. 1). The *drumMUSTER* Program is designed to reuse or recycle plastic drums used in the application of farm chemicals, but always triple rinse containers.

### Protective clothing and equipment

Protective equipment is worn to prevent chemicals entering the body by skin contact, inhalation of fumes, vapours or dusts, or accidental swallowing, e.g. with food. The label always has information on what protective clothing should be worn. When spraying, the operation should be as comfortable as possible but as a minimum should wear buttoned up (at wrist and neck) coveralls, appropriate respirator, boots and washable hat. Washable protective clothing should be soaked in bleach and washed separately each day before reusing. Cartridges in respirators should be carefully maintained and old cartridges should be destroyed so they are not accidentally reused. A range of compressed-air face shields is now readily available commercially. These give full-face protection and are much more comfortable to use in hot humid conditions, which often occur when dealing with sugarcane.

Handling and mixing of concentrates needs particular care as this is a hazardous operation. If the labels show the chemicals used are scheduled poisons S6 or S7, then full protective clothing should be worn.

### First aid

The danger from pesticides can be minimised with some simple first-aid precautions. All workers should know the first aid instructions for a particular chemical; these are on the label and in the MSDS. Further information about poisons is available from the

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Poisons Information Centre (in Australia telephone 131126), which provides emergency information and treatment about particular chemicals. Most hospitals will provide information on environmental health hazards from chemicals. All members of the family and work unit should do a first-aid course.

A first-aid kit should be available in a handy and protective place. The kit should include antidotes, a towel, clean clothing, an approved resuscitation mask for expired air resuscitation, disposal eye wash bottle and solution, soap, nailbrush, and instructions on how to use this equipment. For skin contact, wash with soapy water, rinse with clean water, remove contaminated clothing and seek medical advice. For eye contact, hold the eye open under running water for 15 minutes. Seek medical advice. For swallowing, telephone the Poisons Information Centre (131126).

### FURTHER READING

- AVCACODE** undated. Disposal of farm chemicals and containers on the farm. No. 1. Agricultural and Veterinary Chemicals Association, Sydney.
- AVCACODE** 1989. Farm storage of agrivet chemicals. No. 2. Agricultural and Veterinary Chemicals Association, Sydney.
- AVCACODE** 1983. Disposal of pesticide spills. No. 4. Agricultural and Veterinary Chemicals Association, Sydney.
- CANEHARVESTERS** undated. Safe Operating Practices for Cane Harvesting and Haulout. Queensland Mechanical Cane Harvesters Association, Capalaba.
- Department of Employment, Training and Industrial Relations** 1998. Pesticides—safe use. Safety Link. Rural—8.
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- Department of Employment, Training and Industrial Relations** 1999. Rural Industry Workers' Guide. Available at [www.detir.qld.gov.au/hs/brochure/brochure.htm](http://www.detir.qld.gov.au/hs/brochure/brochure.htm).
- Department of Employment, Training and Industrial Relations** 2000. Rural Employers' Guide to Introduce Worker Safety. Available at [www.detir.qld.gov.au/hs/brochure/brochure.htm](http://www.detir.qld.gov.au/hs/brochure/brochure.htm).

