

# **Cotton Harvest Safety**

## **A Practical Safety Guide**





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#### CONTENTS

1.	Introduction	3
	This publication - its purpose	3
	Cotton Harvest Health and Safety	3
	Legal obligations of cotton growers	8
2.	Finding and fixing safety problems on cotton farms	9
	Cotton Pickers	12
	Tractors, Module Builders and Boll Buggies	18
	Telehandlers and Infield Loaders - Loading and Transporting Cotton Modules	23
	Truck, Vehicle and Machinery Traffic Management	26
3.	People at Special Risk	27
4.	Emergency Preparedness	28
5.	Health and Safety Plan and Practices	29
6.	Further Information	30
7.	National Contacts	31

To identify further hazards associated with cotton harvest, refer to the following Safety Guides developed by the Australian Centre for Agricultural Health and Safety:

Noise on Farms Ergonomics and Manual Handling on Farms Organic Farm Dusts Heat Stress on the Farm Sun Safety on Farms

Further information about Workshop, Tractor and the Safety of Quads and Side by Side Vehicles can be found in:

Health and Safety in the Farm Workshop - A Practical Guide Tractor Safety - A Practical Guide, and Safety of Quads and Side by Side Vehicles

These safety guides are available from the Australian Centre for Agricultural Health and Safety, or to download from <u>www.farmsafe.org.au</u>

## 1. Introduction

## This publication - its purpose

This publication aims to provide practical safety guidance for cotton growers, managers and workers to improve and ensure the safety of those working during the cotton harvest.

The document provides information on the hazards and risks associated with cotton picking, module building and transporting modules on farm. This document provides practical guidelines on how to implement effective work health and safety (WHS) controls that will not only prevent and reduce injury, but will assist cotton growers to meet their WHS legal requirements.

Farmers growing cotton should use this document in association with the *Managing Cotton Growing Farm Safety* resource package - practical management tools for implementing work health and safety - available on the Farmsafe Australia website <u>www.farmsafe.org.au</u> and Cotton myBMP <u>www.mybmp.com.au</u>

The guideline has been prepared by the Australian Centre for Agricultural Health and Safety and Cotton Australia's Cotton Safety Reference Group.

## **Cotton Harvest Health and Safety**

Cotton picking involves people operating cotton pickers, tractors and boll buggies, module builders, telehandlers, infield loaders and associated service machinery in the process of getting the cotton from the field to the gin.

This is a process with which there are many associated hazards. There is a high risk of death or injury associated with the hazards of picking, as well as clearing blockages during picking, machinery repair and maintenance.

However, there have been considerable changes with the design and adoption of round module pickers, eliminating module builders and the way modules are transported.

This has had a significant affect associated with the safety of cotton harvesting. Cotton picking, module building, tarping, loading and transport will be dealt with separately in this safety guide. In addition to these hazardous activities, hazards involved in the interaction of all members of the picking team will be examined.

## **Legislated Responsibilities**

The legislated responsibility for all cotton growers and employers (PCBU) involves:

- 1. Maintaining work areas, machinery and equipment in a safe condition.
- 2. Organising safe systems of work.
- 3. Assessing health risk to employees and others in the workplace.
- 4. Providing adequate information, instruction, training and supervision to employees.
- 5. Ensuring safe use, handling, storage and transport of equipment and substances.

The legislated responsibility for all employees includes:

- 1. Taking care of health and safety for themselves and others in the workplace.
- 2. Cooperating with their employer to ensure that WHS requirements are met at the workplace, and
- 3. Reporting hazards that they identify in the workplace.

## **Cotton Growing**

The cotton farm is an environment in which there is a high risk of serious injury, particularly during cotton picking.

This Guidance Note has been produced as part of a package - Managing Cotton Farm Safety. Section 1 of this resource contains checklists covering key hazards associated with cotton growing, including picking. These checklists are designed to assist owners/ managers in conjunction with workers and family members, to identify specific hazards to health and safety on their farm. This Safety Guide can then be called upon to provide assistance in assessing the risk associated with hazards and in selecting and implementing actions to reduce risk.

Clearly, major modifications to cotton picking machinery are costly and are not always an immediate option for some growers. However, in redesigning existing work practices, careful consideration of machinery options and the health and safety of all workers, should be important factors. In most instances, a careful assessment of the health and safety hazards will identify practical and achievable changes that can be made.

Recommendations included in this Safety Guide have taken into account information about injury and illness occurring on Australian cotton farms, as well as requirements under each State's WHS legislation and other relevant Codes of Practice and Standards.

## Hazard Identification, Risk Assessment and Control

## 1. Hazard Identification

Safety assessments should look for possible hazards from machinery and processes used during the cotton harvest. Assessments should consider the machinery used, the environment, the machinery operator and the interaction between all of these.

#### Features of the Machinery

- Presence of adequate guarding of exposed moving and hot machine parts
- Regular maintenance and safe maintenance procedures
- Dust reduction and protection measures including the availability of Personal Protective Equipment and clothing
- Noise reduction features including the availability of Personal Protective Equipment
- Ease of access and exit to machinery and the condition of steps and handrails
- Presence of emergency equipment including fire fighting equipment
- Appropriate position of controls, the operator and emergency controls
- Condition of seat

## *Features of the environment*

- Physical obstacles e.g. tail drains, head ditches, irrigation structures, overhead powerlines
- Degree of slope of fields and tail drains.
- Minimum height of powerlines
- Condition of roads and route selection for transporting of machinery
- Amount and interaction with other traffic and machinery

#### Features of the Operator

- Experience of the operator and training received in the safe operation and maintenance of machinery
- Instruction using the Operator's Manual
- Literacy level of the operator

#### 2. Risk Assessment

The risk is the potential for an adverse outcome from exposure to a hazard. When determining the risk associated with a particular hazard and determining priorities for action, it may be helpful to consider the following:

Who is at risk?

- Operators, bystanders, including ground crew and passengers
- Children
- Servicing and repair personnel
- Older people
- Fatigued workers

#### The nature of potential injury or illness

How common is injury, illness or death from cotton picking?

#### Features of the operator

- Age of the operator. People who are very young or old are at increased risk of injury.
- Training and experience of the operator safe work practices are more likely to be adopted when operators have received training in the safe operation of the cotton picker.

#### Features of the machinery

- Guarding of exposed moving parts on the cotton picker
- Requirements for maintenance
- Frequency and types of blockages
- Noise levels generated by the machine
- Sealing of machine cabin to reduce dust and chemical exposure
- Seat design

#### Features of the environment

- Position and height of overhead powerlines
- Road conditions including width, route, degree of slope

How severe is the likely resulting injury?

 Agricultural machines are associated with high rates of injury, particularly where there are exposed moving parts, as in the cotton picker. These injuries can range from First Aid treatment to permanent disability or death.

#### Degree of risk and priority for action

 A priority table developed by Safe Work Australia has proved helpful in determining risk level:

#### 3. Risk Control

There is usually more than one means of reducing the risk associated with a particular hazard. However, general principles have evolved that can assist in setting in place the "best practice" option.

A ranking of risk control measures, from most effective to least effective, has been established. Growers should always try to choose the highest level of control for their situation. The control measures are as follows:

#### • Eliminating Hazards

This control measure is the most effective as it removes the hazard altogether.

#### • Substitution for a lesser hazard

This control measure involves use of a different machine, material or work practice which poses less risk to perform the same task. Using a newer model machine that is better designed and therefore poses a lower level of risk, is one example of substitution. Using contractors with newer/safer machinery is a substitution control.

## • Engineering/ Design options

This control measure involves redesigning the machinery or work processes to reduce or eliminate the risk. An example of an essential design control is effective guarding of all exposed, moving machine parts.

## • Safe Work Procedures and Practices

Where a hazard cannot be removed or modified using the above principles, then establishment of work rules or practices may be the only option. These measures will generally be the least effective, as humans will, in some circumstances, become thoughtless, take a short cut, or even deliberately deviate from safe practice. However, where such measures are considered the best option, it is important that all workers have adequate orientation to the "rules" and are trained how to work safely.

## • Using Personal Protective Equipment (PPE) and clothing

Where it is likely that the worker will be exposed to hazards - e.g. chemicals, then using Personal Protective Equipment (PPE) and clothing will be necessary to prevent injury or illness in conjunction with closed systems for mixing and transfer of chemicals. Proper instruction and training is also required. Other work clothing may also be included as a control under this heading - appropriate work boots, snug fitting clothing, shirts tucked in and no loose ends.

- First Aid
  - Develop an emergency plan covering the most likely types of safety incidents.
  - At least two people on each farm should be trained in First Aid.

First aid kits should be readily available during cotton picking e.g. in a work vehicle at the picking site. The legal requirements vary from state to state and need to be checked with your Work Health and Safety Authority.

People working growing and harvesting cotton are exposed to a range of injury hazards - many are common to other commodities and sectors in agriculture, but many are specific to cotton growing and harvesting.

Hazards associated with cotton growing and harvesting include:

- Mechanical hazards associated with machinery involved in cotton growing; including tractors, slashers, stalk pullers, cultivating, planting and harvest machinery (pickers, boll buggies, module builders and telehandlers), farm motorbikes, quads, side by side vehicles, utes, trucks and chain beds.
- Manual handling hazards
- Biological hazards cotton and other organic dusts
- Chemicals fuels, herbicides, insecticides, fungicides, rodenticides and grain fumigants
- Solar radiation working outdoors in heat and sunlight
- Electricity
- Noise causing hearing injury, loss and tinnitus
- Stress and fatigue

The types of injury range from death to serious injury requiring treatment in hospital and down time, to "nuisance" injury that stops work for a short time, or makes work slower and reduces productivity.

## Legal obligations of cotton growers

Work Health and Safety laws are similar in all States in that they lay down the responsibilities of key parties involved in reducing the risk of injury and illness associated with work.

Responsibilities of a Person Conducting a Business or Undertaking (PCBU) (*employers*) include having a safety plan that incorporates:

- Consulting with workers to implement and manage WHS plans and programs
- Providing a safe working environment ensuring the machinery is safe, maintaining work areas, machinery and equipment in a safe condition
- Assessing health and safety risks to employees and others in the workplace; eliminating and instituting effective risk control measures
- Organising safe systems of work making sure that people are safe
- Ensuring safe use, handling, storage and transport of plant and hazardous substances
- Providing information, instruction, training and supervision to employees
- Providing facilities for the welfare of workers, and
- Being prepared for emergencies

Workers (employees and contractors) also have responsibilities. Workers must take reasonable care of the health and safety of themselves and others and cooperate with management (the PCBU), in their efforts to comply with work health and safety law to provide a safe workplace.

Manufacturers, designers and suppliers of plant and substances for use by people at work must make sure that machinery is safe and without risks to health when properly used. They must also supply adequate information to ensure its safe use and maintenance e.g. Operator and Maintenance Manuals.

Each of these WHS duties (obligations) must be met on all farms.

## Finding and fixing safety problems on cotton farms

The key processes (or steps) that must be set in place to manage WHS risk are:

#### 1. Involve your workers - Consultation

There must be ways for workers to actively participate in the farm business WHS program. How managers, employers and other workers are involved will vary on different properties and methods may include:

- Safety induction for new workers (including contractors)
- Regular meetings where safety issues are discussed such as toolbox meetings
- Systems whereby safety representative are nominated to have specific responsibility for liaison between workers and managers

Whatever system is in use, it is essential that there is a clear commitment to safety by the PCBU (owner/ manager) and that this is obvious by the day-to-day safety management, behaviour and activities

#### 2. Look for unsafe machinery and unsafe practice – Hazard identification

Safety hazards must be identified systematically. This means that farm owners, managers and workers must identify situations, machinery and jobs that may cause injury or illness, not only to people doing the work but also to bystanders and visitors.

Hazard identification should be an ongoing and be carried out:

- At least annually
- When systems change, i.e. new equipment is purchased, changed work practices or new facilities

All workers should be actively encouraged to report anything that could be considered hazardous (dangerous) to health and safety - any unsafe condition or unsafe action needs to be identified and action taken to make it safe.

#### 3. For each hazard, consider the likely outcome - Risk assessment

Consequence	Frequency of exposure to hazard				
of injury	Daily	Weekly	Monthly	Rarely	
Kill or disable	HIGH	HIGH	HIGH	HIGH	
Several days off work	HIGH	HIGH	MEDIUM	MEDIUM	
First aid	HIGH	MEDIUM	LOW	LOW	

Risk associated with each hazard must be assessed in terms of the severity of the potential harm that could occur and the likelihood that such an outcome could occur - generally greater if workers are frequently exposed to the hazard.

## 4. Control risk using the hierarchy of control approach - Risk control

Risks must be controlled to prevent injury. The *hierarchy, or order of effectiveness*, is as follows:

## A. Eliminating hazards

Where reasonably practicable, hazards must be eliminated or removed from the workplace. This is obviously the most effective way to reduce risk. While it is often not possible to eliminate a hazard, WHS regulations require the PCBU (employers) or controller to take this option, especially where there are known and accepted controls.

Information about what is *reasonably practicable* can be found in many of the safety *Codes of Practice* developed by Safe Work Australia and adopted by the State Work Health and Safety authorities. These Codes of Practice describe minimum acceptable safe performance and what is *reasonably practicable*. If it is not possible, then the next most effective solution should be sought and put in place.

## B. Substitution for a hazard of lesser risk

Where it is not possible to eliminate a hazard altogether, consider whether the hazard can be substituted for something that will do the same job, but has a lesser risk.

## C. Engineering controls - isolating workers from hazards

In most hazardous situations it is possible and practicable to improve the design of work and/ or isolate the worker from the hazard. This is the basis of most of the safety improvements that should be put in place by cotton growers to reduce risk of injury as well as to be compliant with WHS regulations.

## D. Administrative controls

Administrative controls include *Safe Operating Procedures* or rules, organising work in such a way that it reduces risk, giving safety induction and training to workers, supervising unskilled workers and providing safety information to workers about the safety risks associated with their work and how these risks can be minimised.

## E. Personal Protective Equipment

Providing and using Personal Protective Equipment (PPE) where workers cannot be protected from a hazard by a control measure higher up the *Hierarchy of Controls*. This includes providing helmets to protect from head injury for riders of motorcycles and quads, hearing, eye and lung protection.

These guidelines suggest the higher order controls in the first instance, with the lower order, less effective controls that depend on individual behaviour, lower in the list.

In practice, best practice WHS risk management will require a mix of controls for high risk hazards.

## F. Record Keeping - Keep written records of your WHS activities

Records of all activity in your WHS program must be kept, to be able to report, monitor and review your businesses health and safety performance.

These are not steps to be taken on a one-off basis. The process would be better illustrated in this way:



This process should become a key and integral part of the management of the whole business.

Successful businesses invest significantly in WHS in terms of time, money and commitment at all levels. These businesses understand that overall performance of the business benefits from good WHS practice, many reporting significant productivity gains from this investment.

Such businesses do not accept that the major responsibility for workplace health and safety rests in the workers themselves, rather the opposite - that safety is a key management responsibility, and involving workers is a critical and core management skill.

## **Cotton Pickers**

High risk hazards associated with cotton pickers are:

- Workers being entangled in picker heads when they are being cleaned with the heads engaged
- Working and being crushed under raised heads or baskets that have not been chocked or supported or where ram, head and basket locks are not fitted or used
- Falls when cleaning the top of picker baskets without using handrails or using a fall prevention harness
- Electrocution; coming into contact (or near contact) with overhead powerlines
- Run over of other workers and bystanders
- Tipping or rolling pickers in steep tail drains or moving pickers with the basket raised
- Burns associated with picker and module fires.

Other potential hazards associated with cotton picking include:

#### Mechanical

- Entanglement with moving parts
- Crush injury to hands whilst clearing blockages or during picker servicing
- Machinery accident and collision
- Collision with other vehicles and machinery

#### Environment

- Cotton and organic dusts and airborne particles
- Exposure to loud noise
- UV/ solar radiation

#### Work process

- Slips, trips and falls
- Manual handling injury

#### **Hazard and Risk**

## Risk Controls

#### **Entanglement in moving parts**

**Pinching** - may occur where machine parts move over one another e.g. chains rolling over sprockets, belts over pulleys, meshing gears. These are normally guarded, however, when guards are removed for inspection and servicing extra care must be taken.

**Wrapping** - exposed shafts or rotating machine parts may catch loose clothing or hair, which may be drawn around the shaft. Keys, pins and splines are catch points for loose clothing. However, static electricity may even attract clothing or hair to a smooth drive shaft. Effective guarding is an essential design control for all moving and exposed parts on cotton pickers that are within reach of an operator or bystander.

Accessible two way radios or mobile phones are a design feature which can reduce the risk by minimising the length of time before a victim is found.

Routine servicing and maintenance of machinery will reduce the incidence of and incidents due to mechanical failure.

Ensure that all guards are replaced after servicing and before a picker is used.

**Shearing -** may occur when the edges of the two machine parts move across one another.

Cotton picker spindles working in relation to the doffer assembly is one example of a designed shear point (to doff, unwrap cotton lint from the spindle once picked off the plant). There are many other shear points such as picker head and basket supports and hinges.

**Crushing** - may occur between the picker head and the ground, under raised picker baskets or between machine parts. Crush injuries are frequently the result of operators not taking time to adequately block/ chock machines or install ram locks on machinery to prevent collapse before working under them.

**Projectiles** - machine parts, sticks and mislaid tools frequently fall from machinery or onto moving parts and can be thrown with force.

Due to the severity of the resulting injury from these hazards, the risk is usually assessed as being high and therefore would require immediate action to control the risk of injury.





#### **Risk Controls**

Proper training will ensure that workers are familiar with all the controls and operations of all machinery involved in cotton harvest.

Stabilise equipment properly before attempting a repair. If removing a wheel, always chock other wheels and store unattached wheels safely where they can't fall on anybody. When hydraulic power is used to raise a machine, alternative mechanical locks such as wide base jacks and proper axle stands or supports should be used in case of hydraulic failure.

Machinery must never be modified to bypass safety devices.

Pay attention to safety signs placed on machinery by manufacturers.

Follow safety instructions, carefully read all safety messages in the Operator's Manual and follow all safety decals and signs on the machine.

The machine should only be operated with no more than one person (the operator) on the machine.

All controls should be in neutral before starting the machine. Controls should only be operated when seated in the operator's seat.

Always disengage the motor before dismounting, and if possible, before unblocking or servicing picker heads. Never jump from a machine.

Always engage basket cylinder lock valves, safety lockouts, or stops before working under a raised basket or picker heads.

When a picker drum chokes, disengage all power and shut off the engine. Wait until all parts have stopped moving and then remove the obstruction. Rotate the doffer manually or as otherwise instructed by the Operator's Manual until the obstruction can be removed.

Ensure all persons are clear of the picker before lowering the basket.

Travel speed should be such that complete control and machine stability is maintained at all times, especially when turning.

Working distance between pickers should be maintained at approximately 100 metres.

Maintain a safe working distance between pickers.

#### **Risk Controls**





When dumping, ensure there is no one near the basket, trailer or module builder and ensure that the picker is not on a grade or slope.

Make sure the basket is lowered before moving a picker. A picker should never be driven with the basket raised.

If it is necessary to enter the basket, do so only when the conveyor is not operating.

Never try to turn the picker drum by engaging the power and pushing the spindles with your foot. If the obstruction suddenly breaks free and the picker unit turns under power, it will endanger any part of you body near the spindles.

Never operate the inspection bypass while standing on top of the picker heads. If your machine has such a safety system, use it as instructed and don't attempt to override it.

Frequent short breaks when using machinery for long periods of time will help reduce fatigue.

It is essential to wear snug-fitting clothing made of natural fibres, shirts tucked in, buttons done up and long hair tied back to avoid entanglement with shafts.

#### **Overhead Powerlines**

Electrocution of the picker operator and others can occur when pickers are operated or baskets are raised under or near overhead powerlines.

There is no doubt about the risk to health and safety of a person, or item of plant, coming into contact with, or too close to a live power line.

The chances of surviving an electric shock are very low. Even if a person survived the shock, their injuries would be serious and long term.



Where practical, relocate powerlines away from fields and traffic areas.

Assess the height of overhead powerlines in relation to machinery. Ensure that safe routes for machinery have been worked out with all machinery users.

Likewise, a farm map of the environmental hazards such as ditches, banks, channels, powerlines etc. needs to be available to every person who operates mobile machinery on the farm. Marking the ground, placement of drums and other objects, or changing traffic flow are options to control electrical hazards.

Work Health and Safety Codes of Practice for working near overhead powerlines require a minimum exclusion zone of 3 metres from up to 132 kV powerlines for all mobile plant and machinery.

Further information can be found in the *Electrical* safety code of practice - Working near overhead and underground electric lines

#### Dust

Respiratory problems associated with cotton dust may be acute (immediate) or chronic (longterm) in nature. Responses to exposure to cotton dust include:

- Runny nose and eyes, itchy eyes, nose and throat
- Airway responses:
  - o Inflammation of the airways
  - o Asthma

#### **Risk Controls**

Enclosed cabins with filtered air systems will decrease the risk of health effects from inhaling dust and fumes.

Maintaining air conditioning filters and cabin door seals will reduce exposure to cotton dust.

Respiratory protection should be worn when cleaning cotton pickers if there is a risk that the worker may be exposed to cotton dust.

The picker should never be driven with the door open unless appropriate respiratory protection is worn to reduce exposure to cotton dust - this also applies when dumping cotton.

Suitable dust masks or respirators should be available when there is a risk of operator exposure to cotton dust.

#### Fire

Cotton lint is highly flammable and picker fires occur frequently.

Fire may result in minor and significant health effects, including eye and respiratory effects, as well as serious burns.



Due to the highly flammable nature of cotton, smoking should be prohibited around cotton pickers. Prevent fires by keeping machine clean of accumulated lint, trash and grease. Always clean up spilled fuel after refuelling.

When refuelling ensure engine is turned off and avoid smoking.

Avoid dumping cotton into the wind as lint may be blown onto the hot engine causing a fire.

All cotton pickers should be fitted with a fully charged fire extinguisher.

All cotton picker operators need to be aware of emergency procedures to follow in the case of fire.

Ensure all workers, cotton picker operators and module builder operators are familiar with and use the communication system, including mobile phones, UHF radios as well as signal communication.

Ensure that a water truck is available for fire fighting.

#### Noise

Hearing injury occurs where the operator and/ or bystanders are exposed to damaging levels of noise associated with machinery and motors.

It has been found that 60% of male farmers who have undergone hearing screening in Australia, show evidence of significant noise induced hearing loss.

The affected person is becoming deaf by being exposed to loud noise and has difficulty discriminating or understanding what is being said.

Hearing loss may also contribute to increased risk of injury because of inability to hear signals, loss of concentration, increased fatigue and stress.

Noise induced hearing loss also has a significant impact on a persons well-being.

#### UV/ Solar radiation

The short-term effect of excessive sun exposure is sunburn. The more often a person is sunburnt, the more likely it is that they will develop skin cancer - the most common form of cancer in Australia.

Short-term effects of excessive sun on the eyes may include soreness and swelling with excessive blinking and difficulty in looking at bright lights.

The long-term effect of excessive sun exposure is premature ageing of the skin, cataracts of the eye, keratoses or "sun spots" and skin cancers.

#### **Risk Controls**

Reduce noise by replacing faulty mufflers and other exhaust parts.

The picker should never be driven with the door open unless appropriate hearing protection is worn.

Earmuffs or plugs should be worn where necessary to protect hearing.



Workers should wear long trousers, work boots, long sleeve, light-weight cotton shirt and a broad brimmed hat

Sunscreen and sunglasses should be provided, and worn by all workers who are exposed to the sun.



#### Slips, trips and falls

Slips, trips, and falls are common during dismounting. Risk is increased when workers jump from the machine, or slip on surfaces that slope, or are wet or slippery.

There is also significant risk of serious injury from falls whilst undertaking maintenance or cleaning tasks on top of a picker basket. Apply skid resistant surfaces on steps, platforms and foot controls/ pedals.

Ensure handrails and handles are present and in good condition

Effective lighting will improve visibility of picker steps as well as the ground, which is important during cotton picking. The risk of injury is increased when working at night.

#### **Risk Controls**

Do not jump off machinery; maintain 3 points of contact when climbing machinery steps and ladders.

When working on top of the picker basket use a fall prevention harness.

#### **Ergonomic Hazards**

Ergonomic hazards can lead to injury, fatigue, and loss of concentration, leading to other injuries.

Ergonomic problems include the important area of manual handling as well as the relationship of the operator to the machine. Risk factors related to cotton picking may include:

- Position of the operator in relation to controls and the shape of the controls
- Seat design
- Posture which the worker is forced to adopt while using the machine
- Age and experience of the worker.

A firmly mounted seat of adequate proportions equipped with shock absorbers and preferably pneumatic suspension should be fitted to cotton pickers.

Proper maintenance of machinery will reduce the severity of vibration and the incidence of injury.



#### Manual handling

Lifting loads can result in back and other musculoskeletal injury.

#### In-field maintenance and repair

People doing in-field maintenance and bystanders are at risk of entanglement while engines are running.

Operators are at risk of crush injury while working underneath chocked machines.

People working under machines may be at risk of being run over if the machine is operated with the person still underneath. Use a lifting aid (forklift or jib crane) to lift heavy loads.

Get help from another person to help lift and move heavy loads.

Turn off engines and remove keys before performing maintenance or adjusting any machinery.

Ensure that machinery and vehicles are properly chocked and supported before beginning maintenance or working under tractors and machinery.

Inspect and make sure all people are away from machinery before restarting or moving tractors and machinery.

## Tractors, Module Builders and Boll Buggies

The key high risk hazards associated with the operation of module builders, tractors, boll buggies and tarping modules include:

- Crush injury and asphyxia under module builder trampers when operators or bystanders are smothered by lint dumping from pickers or boll buggies into module builders
- Crush injury associated with tractors and boll buggies; the operators and bystanders being runover and crushed under raised baskets and rear doors
- Entanglement of workers limbs in unguarded rotating PTO shafts
- Falls from module builders and machinery during their operation and when tarping modules
- Electrocution from raised tramper masts in contact or near contact with overhead powerlines
- Collision with vehicles, machinery and irrigation infrastructure e.g. drop boxes and irrigation gates and crush injury associated with rollover of tractors and machinery into irrigation channels
- Bystanders being run-over by machinery
- Ruptured hydraulic hoses and injury from high pressure hydraulic oil
- Burns from module fires
- Sunburn from UV /solar radiation
- Hearing injury from exposure to loud noise when operating module builders
- Cotton and organic dusts eye injury and lung damage; manual handling injury

## Hazard and Risk

#### Tractors

Injuries associated with tractor rollover and runover frequently result in death.

Death can occur from crush injury of the head, trunk, arm or leg. This happens when the operator or passenger:

- Is crushed under the tractor during rollover.
- Is crushed between the tractor and implement or falls off the tractor and is runover
- Entanglement with PTO shafts usually result in serious injury, if not death, including:
  - Crush injury and death
  - Amputations
  - Severe twisting of body parts
  - Dislocation of joints, and
  - Laceration

Other non-fatal crush injuries may also occur.

Ensure that all tractors are fitted with a cabin or Roll Over Protective Structure before they are used.

Check that all PTO shafts are fitted with a functional PTO shaft guard. Replace all worn or damaged guards before the PTO shaft is used.

Further and more detailed information can be found in Safe Tractor Operation - a practical guide.



## **Risk Controls**

#### **Boll Buggies**

Boll buggy drivers are at risk of electrocution when boll buggy baskets are raised or when transporting buggies on irrigation channels and under low overhead powerlines.

Workers are at risk of serious crush injury working under raised buggy baskets during maintenance or repair.

#### **Risk Controls**

Ensure that where practical, overhead power is relocated or raised to prevent contact or near contact with overhead powerlines.

Work Health and Safety Codes of Practice for working near overhead powerlines recommend a minimum of a 3 metre exclusion zone for powerlines up to 132 kV for mobile plant and machinery.

#### **Module Builders - Crush Injury**

Death and serious crush injury has occurred with operators being crushed under the tramper when compacting cotton and lowering the tramper for transport.

Serious crush injury of bystanders or other workers can occur when opening and closing the back door of the module builder when a person is standing next to or under an opening or closing rear door.

Workers have also been crushed raising and lowering the wheels before checking that all bystanders and workers are clear.



Fit Emergency Stop buttons nearby and within easy access of the module builder operator or other workers; especially those builders that have automatic tramper modes.

Check that Emergency Stop buttons are working at the beginning of each shift.

Make sure that the tramper hydraulics and automatic controls are turned off before any workers get inside a module builder.

Never operate the tramper or trolley when a worker is in the module builder.

Reducing the number of people working around the module builder to a single trained operator reduces risk. Keep unnecessary bystanders away.

Wearing high visibility clothing at night increases the visibility of workers and can reduce the risk of workers being runover and crushed.

Never release the back door, raise or move a builder off a module before ensuring everybody is well clear.

#### Falls

Falls from module builders are a common cause of injury.

Module operators are at risk of falling injury to limbs, joints, broken bones, serious head, neck and spine. Use a fall prevention harness when working on the tramper, mast and monkey.

Module operators should not walk along the edge of module builders, or jump from one builder to another or climb from builders to other machinery.

Hazard and Risk	Risk Controls
Electrocution A person or item of plant, coming into contact with, or too close to live powerlines, poses significant risk to health and safety. The chances of surviving a shock are very low. Even if a person survived the shock, their injuries can be serious and long term.	Do not place or operate the module builder near to overhead powerlines. Maintain a safe operating distance away from powerlines. A minimum exclusion zone of 3 metres should be maintained for powerlines of up to 132 kV. Use a safety observer when transporting builders under powerlines. Ensure that safe routes for module builder transport have been established. Always collapse tramping ram and supports when transporting builder.
Suffocation Operators working in module builders are at risk of being smothered and suffocated by cotton lint being unloaded (dumped) into the module builder.	Reducing the number of people around the module builder to a single trained operator reduces risk injury. Keep bystanders away. Check that there are no people in the module builder before dumping cotton into the builder or given the all clear by the press operator. Wearing high visibility clothing increases worker visibility especially at night.
<ul> <li>Hydraulic Hoses</li> <li>A common source of injury is from hydraulic oil leaking at high pressure from damaged hydraulic hoses and fittings.</li> <li>Hydraulic oils are poisonous and high pressure injection of hydraulic oil can be life threatening if it penetrates the skin into muscle and tissues.</li> </ul>	Routine inspection, repairs and maintenance of hydraulic hoses to detect and prevent leaks. Ensure that hydraulic pressure is released before working or repairing hydraulic lines and fittings. Do not touch or handle damaged hydraulic hoses. Do not dismiss, delay or put off emergency medical treatment if hydraulic oil penetrates or injects the skin, most commonly to fingers, hands and arms. Don't delay treatment.
<b>Compressed Air</b> Serious eye, ear, hearing and lung injury can occur when using compressed air to blow down and clean machinery, radiators and air filters.	Air hose fittings and couplings must have safety clips fitted to them to prevent inadvertent uncoupling when under pressure - never use makeshift tie-wire. Check that compressed air hoses and fittings are not damaged and that bystanders are clear before using compressed air to blow down filters and machinery. DO NOT use compressed air on yourself or other workers, or to clean clothes or cool yourself.

#### **Risk Controls**



DO NOT play practical jokes with compressed air or use it to propel objects at other workers.

Always wear eye, hearing and dust masks that meet the Australian Standards when using compressed air.

#### Fire

Cotton lint is flammable. Module fires are a hazard. Fire may result in significant health effects, including eye and respiratory effects, and serious burns.



Because cotton is flammable, smoking should be restricted around modules and module builders.

All module builders should be fitted with a fully charged fire extinguisher.

All module builder operators need to be aware of emergency procedures to follow in the case of a fire in a module.

Ensure that a water truck is available for fire fighting, to control module fires.

#### Noise

Hearing testing of Australian male farmers has found that that around 60% show evidence of significant noise induced hearing loss.

The affected person has difficulty discriminating, or understanding what is being said. This can have significant impact on wellbeing.

Hearing loss may also contribute to increased risk of accidental injury because of inability to hear signals, loss of concentration, increased fatigue and stress. Check and replace faulty exhaust mufflers on module hydraulic engines to minimise noise.

If you do not need to be near loud machinery, move away.

Ask bystanders to move away when operating module builders or before using loud tools or machinery e.g. grinders or air compressors.

Wear earmuffs or earplugs that meet the Australian/ NZ Standard 1269.3 Occupational noise management Part 3: Hearing protector program to protect worker hearing.

Hazard and Risk	Risk Controls
<ul> <li>Dust</li> <li>Eye and respiratory problems associated with exposure to cotton dust may be acute (immediate) or chronic (long-term). Exposure to cotton dust includes:</li> <li>Runny nose and eyes, itchy eyes, nose and throat</li> <li>Inflammation of the airways</li> <li>Asthma</li> </ul>	Suitable dust masks or respirators should be available and used when there is a risk of operator exposure to cotton dust.
UV /Solar Radiation The short-term effect of sun exposure is sunburn – reddened skin, blistering, swelling and peeling. The more often a person is exposed to the sun, the more likely it is that they will develop skin cancer – the most common form of cancer in Australia. Short-term effects of excessive sun exposure on the eyes may include soreness and swelling with excessive blinking and difficulty in looking at bright lights. The long-term effect of excessive sun exposure is premature aging of the skin, cataracts of the eye, keratoses or "sun spots" and skin cancers.	Fit a canopy to module builders or work under a canopy or shade. Workers should wear long trousers, work boots, long sleeve, light-weight cotton shirt, and a broad brimmed hat. Sunscreen and sunglasses should be provided and worn by all workers who are working outdoors in the sun.
<b>Tarping</b> Tarping of modules may result in lacerations or puncture injuries from tarping spears, as well as body strains and sprains from the process of tarping, especially in windy conditions. Serious injuries may result from falls from the top of modules, or from jumping down from modules.	Eliminate the need for tarp spears by using other methods to insert module ropes and fix tarps to modules. Avoid tarping in excessive wind. If required to tarp in windy conditions, then have enough workers involved to avoid injury. Use a ladder to climb onto and down from modules when spreading tarps.

## **Telehandlers and Infield Loaders - Loading and Transporting Cotton Modules**

The safety of all people should be considered in planning and moving, loading and transporting modules. The PCBU is responsible for the safety of contractors and visitors under state WHS Acts and Regulations. Potential hazards associated with transporting modules include:

Mechanical

- Entanglement in machinery
- Runover
- Collision

Environmental

- Fire
- Road dust and poor visibility

Work process

- Fatigue
- Injury to ground crew
- Slips, trips, and falls

#### Hazard and Risk

#### **Telehandlers, Fork Lifts and Grabs**

Telehandler operators and bystanders are at risk of crush injury from being runover especially when reversing, collision with other mobile machinery, or toppling when telehandlers are overloaded.

Extending and raising telehandlers under overhead powerlines increases the risk of electrocution of the operator.



#### **Risk Controls**

Routine servicing and maintenance of machinery will reduce incidents due to mechanical failure.

Before transporting modules using a telehandler, three point linkage grab or fork lift, ensure that there are no workers or other vehicles nearby.

Where practical, remove or placard overhead powerlines. Check that mobile plant and machinery can be operated and maintain a minimum 3 metre exclusion zone from powerlines up to 132 kV.

Further information can be found in the Safety Code of Practice - *Work near overhead powerlines*. This can be downloaded from the WorkCover NSW or Qld Workplace Health and Safety websites.

**Risk Controls** 



#### **Chain Beds**

Crush injury of bystanders may result when the chain-bed trailer returns from elevated position to horizontal, or if run over by the wheels of the truck when it is moving, loading or unloading a module.

Crush injury may also result if bystanders are close to the back door of the trailer when it is being opened or closed.

Entanglement

Chain-beds and infield loaders used to load modules onto trucks has a high risk of injury for truck drivers.

Entanglement of clothing, jewellery, or long hair has the potential to result in significant injury including lacerations, dislocation of joints, amputation of limbs and death.

Prior to raising or lowering chain bed trailer, or opening or closing the back door of the trailer, the

operator should check and ensure that all

Fitting an alarm to warn bystanders of trucks reversing, operation of the chain bed and the trailer rear door when loading and unloading

bystanders are clear of the trailer.

modules.

Ensure that the chain bed mechanism is disengaged when attempting to clean or clear blockages.

It is essential to wear snug-fitting clothing. Shirts should be tucked in, buttons fastened and long hair tied back to avoid entanglement with chains.

#### **Road Dust**

The dust generated on many farm roads poses a hazard as it reduces visibility and can easily lead to road incidents.

The presence of additional hazards such as narrow roads, water, narrow channel crossings and other farm traffic has led to traffic and vehicle incidents on farm with significant injury and death. When working in particularly dusty conditions, truck drivers and other vehicle operators using roads on the farm should drive with lights on to increase their visibility to other workers and machinery operators.

All workers involved in the carting of modules should receive a map of the farm outlining access routes to areas of the farm, and identifying hazards e.g. channels, head ditches, narrow roads and blind corners.

A traffic management plan will prevent traffic

#### **Risk Controls**



incidents and injury.

All vehicles should be fitted with radios for communication and operators trained in their use.

All drivers and machinery operators should be aware of and adhere to speed limits.

#### **Module Fire**

There is a risk when carting modules.

Fire may result in minor and significant health effects, including eye and respiratory effects, and burns.

Trucks should all contain a fully charged fire extinguisher.

Smoking should be prohibited around cotton modules and during carting.

All workers involved in the carting of modules should be aware of emergency procedures in the case of fire or other emergency situation.

#### Fatigue

Fatigue increases the risk of injury. Reflex times will be slowed and concentration lost. Fatigue is particularly hazardous during cotton carting as long hours are routinely worked, work is carried out through the night and the machinery, process and work pressure involved are such that significant injury may result from even small lapses in concentration. Ensure frequent breaks are taken in an attempt to combat fatigue. Consider shortening length of shifts.

#### Injury to ground crew

There is significant potential for ground crew to be injured transporting modules, simply due to the size, number and mobility of plant used in the process. In addition to these factors, having different groups of people working in the environment who are acting under different supervision increases the potential for injury if communication is not adequate. Ensure all workers, cotton picker operators and module builder operators are familiar with and use the communication system, including mobile phones, UHF radios as well as signal communication.

When working at night ground crews should use reflective vests and torches, to increase their visibility to truck drivers and other machinery operators.

#### Slips, Trips and Falls

There is a risk of injury from slips, trips and falls when mounting and dismounting moving machinery when picking-up or loading modules and climbing onto modules to affix tarps and nets for transport. Using chain-bed trailers to load modules (instead of infield loaders and flat-top trailers). This eliminates the need to climb onto the back of trucks to cover modules with nets and the risk of falling.

	Misk controls
In addition to the movement of trucks, jumping down onto uneven ground has the potential to cause back injury and injury to hips, knees and ankles.	Mounting and dismounting machinery facing the machine, using steps and handrails and maintaining 'three points of contact' will reduce the risk of falling.
Safety precautions should be taken to prevent falls from modules when covering with transport tarps.	

## Truck, Vehicle and Machinery Traffic Management

Workers and visitors are at risk of collision and being runover during harvesting operations, moving, loading and transporting modules. Speed limits and should be agreed and sign posted for traffic in the vicinity of houses, irrigation structures, blind corners and harvest operations.

All workers and contractors should be provided with clear instructions about routes to be taken by loading machinery and trucks transporting modules from the field to the gin.

#### **Hazards and Risks**

Hazard and Pick

#### **Risk Controls**

**Rick Controls** 

#### **Dust and Collision**

Dust generated on many farm roads from traffic poses a hazard as it reduces visibility and can easily lead to vehicle and machinery collision.

The presence of additional hazards such as narrow roads, irrigation channels, narrow crossings and other farm machinery and vehicle traffic and speed has the potential to result in collision with significant risk of serious injury and death.



Develop a traffic management plan for all trucks and vehicles during picking.

When working in particularly dusty conditions truck drivers and other vehicle operators using roads on the farm should drive with lights on to increase their visibility to other workers and machinery operators.

All workers involved in the transporting and carting modules should receive a map of the farm outlining safe access routes to areas of the farm, and identifying hazards e.g. channels, head ditches, narrow roads and blind corners.

All vehicles should be fitted with radios for communication and operators trained in their use.

All drivers and machinery operators should be aware of and adhere to speed limits.

## 2. People at Special Risk

The employer, and/or the person in control of the picking have a responsibility to provide a safe workplace for all people including workers, contractors and visitors.

Most cotton farms in Australia are family farms and are accessible to family members, including children. The safety of all, including children and family visitors must be ensured.

At Risk Group	Risk Controls
<b>Children</b> Children are at special risk of injury on Australian cotton farms.	Young children must be physically separated from the workplace. Establish rules that children can not be taken into the workplace and that all children visiting must be supervised by a parent that is not working.
Visitors and Bystanders Visitors to the farm who are not aware of traffic hazards may pose risk to others as drivers or be at risk of collision and being run over as pedestrians.	Farmers have responsibility to protect the safety of other visitors to the farm workplace. Visitors should not be permitted in the workplace unless that are instructed and supervised to ensure their safety. Visitors to the farm should be directed to the farm office with clearly marked signs. Visitors should be accompanied by a competent person.
<b>Contractors</b> Employers (PCBU) have responsibility to provide a safe workplace for all contractors who work on the farm.	Contractors including tractor operators, harvest contractors and module transport operators should be inducted into the safety systems and rules of the farm business and be made aware of the safety rules and their safety obligations.
Older Workers Older workers, although they may be more skilled, can be less agile and at greater risk of injury. Furthermore, older people if they do fall are more likely to suffer a fracture and take longer to heal when injured than younger people.	Older people may not recognise that they are less agile than young people. Appropriate action, including modifying machinery access, steps and improving handrails, allowing extra time to do a job, can reduce the risk of injury.

## 3. Emergency Preparedness

All farms must be prepared for emergencies. Being well prepared with an Emergency Plan and equipment will help ensure that injury is minimised when incidents happen.

#### **Farm Emergency Plans**

#### General

Farm Emergency Plans and procedures should include a system for dealing with personal injury, poisoning, fire, explosion and spills of fuels and pesticides (hazardous substances). An Emergency Plan should include:

- What to do in an emergency ensure that all workers are in contact with others on the farm, and that emergency personnel can be notified immediately.(this should be included as part of the initial Safety Induction)
- Location of telephones and emergency numbers for Ambulance, Fire Brigade, Police, State Emergency Services and Poisons Information Centre.
- Communication systems (phones, mobile phones and 2 way radios).
- The Emergency Plan with the property name, rural address and directions to the farm should be displayed in workshops, farm offices, and beside all farm phones and two-way radios.
- It is also recommended to record the GPS coordinates of key locations such as the mail box, workshop and airstrips.

#### **First Aid**

A suitable First Aid kit should be accessible to all workers on the farm. The kit should be suitable for management of common farm injuries and snake bite.

At least one person, preferably two people, should be trained in providing Workplace First Aid and hold a current First Aid Certificate.

#### Fire

Work areas should be kept clear of flammable materials and the area around workshops kept clean and clear of debris.

Establish and maintain fire breaks around the farm and paddocks to prevent the spread of fire.

Fire extinguishers should be available where fire is a hazard, especially during electric arc and oxyacetylene welding. It is recommended that a fire extinguisher is carried on all tractors, pickers and service and fuel truck and trailers.

It is also recommended that a water truck, trailer or fire cart is checked and kept ready for picker and module fires.

All workers should be aware of and trained in emergency fire procedures.

## 4. Health and Safety Plan and Practices

## 3.1 Safety Induction for Workers and Contractors

A Safety Induction provides all workers (employees and contractors) with safety information and instruction. It should be noted that a Safety Induction is for use only as an introduction to safety. It provides new workers information about the importance of safety, safety rules and how safety is managed on the farm.

#### 3.2 Managing Cotton Farm Safety - Hazard Checklists, Business Plan and Resources

Cotton growers can obtain copies of the Managing Cotton Farm Safety resources from myBMP, the Australian Centre for Agricultural Health and Safety, or can download a copy from links on the Cotton myBMP <u>www.myBMP.com.au</u> or Farmsafe Australia <u>www.farmsafe.org.au</u> websites.

#### 3.3 Pre-harvest Safety Checklist

A pre-harvest checklist has been developed to help growers manage the safety of those involved in the cotton harvest. This does not take the place of a farm safety plan and program that should be in place, but as a reminder to ensure that machinery and people are safe during the cotton harvest.

## 3.4 Safe Operating Procedures

Specific Safety Induction and Safe Work Operation Statements are needed for the specific jobs that workers will undertake. They will be required for operating:

- Tractors and Boll Buggies
- Operating Module Builders
- Telehandlers
- Chain Bed and Infield Loaders.

## 5. Further Information

#### State and Territory Work Health and Safety Authorities

New South Wales WorkCover NSW Ph: 13 10 50 www.workcover.nsw.gov.au

Australian Capital Territory ACT WorkCover Ph: 02 6205 0200 www.worksafe. act.gov.au

Victoria Victorian WorkCover Authority Ph: 1800 136 089 www.workcover.vic.gov.au

Tasmania WorkCover Tasmania Ph: 1300 366 322 www.workcover.tas.gov.au South Australia SafeWork SA Ph: 1300 365 255 www.safework.sa.gov.au

Western Australia WorkSafe Western Australia Ph: 08 9327 8800 www.safetyline.wa.gov.au

Northern Territory Northern Territory WorkSafe Ph: 1800 019 115 www.worksafe.nt.gov.au

Queensland Queensland Workplace Health and Safety Ph: 1300 369 915 http://www.deir.qld.gov.au/workplace/in dex.htm

## 7. National Contacts

Australian Centre for Agricultural Health & Safety Ph: 02 6752 8210 www.aghealth.org.au

Cotton Australia Ph: 02 9669 5222 www.cottonaustralia.com.au

Safe Work Australia Ph: 1300 551 832 www.swa.gov.au

Standards Australia Ph: 1800 035 822 www.standards.org.au

Farmsafe Australia Ph: 02 6752 8218 www.farmsafe.org.au