31. COTTON CHIPPING

The aim of this document is to provide guidance to farm managers / owners on the hazards to health and safety associated with cotton chipping, assessment of the risks associated with these hazards, and measures which may be implemented to control these risks.

THE HAZARD

Cotton chipping refers to the manual removal of weeds from cotton fields, either by "chipping" with a hoe, or direct pulling of weeds by hand. This process in itself is hazardous due to the high level of pesticide use in cotton production and the possibility of exposure. In addition to chemical hazards, there are other hazards associated with the process of cotton chipping and the environment in which cotton chipping is undertaken. These include:

- Pesticide exposure
- Ergonomic hazards
  - Manual handling
  - Cuts, abrasions, infections, allergies
- Environmental hazards
  - Dehydration / heat stress
  - UV / solar radiation
- Other hazards
  - Snake bite
  - Road accidents

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HAZARD IDENTIFICATION

Identifying hazards associated with cotton chipping involves looking at features of the environment, the chipper as well as the processes involved in cotton chipping.

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- The environment
  - Time of the year - temperature
  - Height of the crop
  - Dew on crop
  - Lack of facilities / amenities
  - Possibility of exposure to drift
  - Possibility of snake bite
  - Re-entry restrictions and PPE requirements
- The process
  - In fields for long periods
  - Manual removal of weeds
- The worker
  - Seasonal workers
  - Inexperience
  - Literacy levels
  - Non English speaking background

COTTON CHIPPING

- To identify further hazards associated with cotton chipping, refer to the following Guidance Notes:
    - 6. Ergonomics and Manual Handling on Farms
    - 13. Farm Chemicals
    - 13a. Health Surveillance
    - 19. Heat Stress on the Farm
    - 20. Sun Safety on the Farm

RISK ASSESSMENT

When determining the risk associated with a particular hazard, and determining priority for action, it may be helpful to consider the following:

- Who is at risk?
- Nature of potential injury / illness?
- Degree of risk and priority for action?
    - i. How common is injury, illness or death from this activity?
    - ii. How severe is the likely resulting injury?
    - iii. How often and for how long are people exposed to hazards associated with this activity?

A priority table developed by Worksafe Australia (1995) has proved helpful in determining risk level:

Consequence of injury	**Frequency of exposure to hazard**			
	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

Source: Adapted from Worksafe Australia. Plant in the Workforce: Making it Safe. Commonwealth of Australia. August 1995

CONTROL MEASURES

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 options from most effective to least effective has been established and should always be considered.

1. Elimination of the hazard

This is the most effective option as it removes the hazard altogether, and as such should be considered first. However, elimination of the hazard is not always a viable option due to reasons of practicability and cost.

2. Substitution for a lesser hazard

Substitution involves the use of a different machine, material or work practice which poses less risk to perform the same task.

3. Engineering / design options

Elimination involves redesigning the machinery or work practices to reduce or eliminate the risk.

4. Safer 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.

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5. Use of personal protective equipment and clothing

Where it is likely that the body will be exposed to some hazards – eg. chemicals, then use of personal protective equipment will be necessary to prevent injury or illness. Again, adequate orientation and training will be required.

Picture

6. First Aid

First aid kits should be available, close to the work area, for use in the case of an incident. The legal requirements vary from state to state and need to be checked with your local Occupational Health and Safety Authority.

COTTON CHIPPING

1. PESTICIDE EXPOSURE

Many pesticides, including insecticides, fungicides, and herbicides are used in cotton production at the same time of the growing season as it is required to use cotton chippers for the manual removal of weeds in the cotton crop. This results in the possibility of cotton chippers being exposed to pesticides.

RISK ASSESSMENT

Nature and severity of the potential illness?

The effects of poisoning from pesticides may occur quickly or develop over a long period of time. Long term exposure, which builds up after repeated exposure, can be more dangerous, as permanent damage has been done by the time the poisoning is treated.

Pesticides may enter the body by:

- skin contact and absorption, including the eyes,
- inhalation of fumes, vapour and dust, and
- ingestion while eating, drinking, smoking, or accidental swallowing.

Acute (short term) health effects of pesticide exposure may include headache, blurred vision, sweating, rapid pulse, heart palpitations, vomiting, diarrhoea, stomach cramps, tingling nerves, muscle twitching, fits, convulsions, breathing difficulties, drooling, reproductive effects and death.

Chronic effects (long-term, delayed or ongoing) may include skin problems, nervous system disorders, blood disorders, liver disorders, allergic effects (skin irritation, rhinitis, asthma) and reproductive disorders.

CONTROL MEASURES

Elimination of the hazard

- Use of Integrated Pest Management (IPM) practices to decrease the need for pesticide use

Substitution for a lesser hazard

- Use of pesticides with lower toxicity.

Safer work procedures and practices

- Ensure fields are dry before chippers enter
- Ensure adherence to re-entry periods
- Ensure that chippers receive safety induction outlining the hazards associated with working in fields that have been treated with pesticide, and procedures to manage risk
- Provide amenities in the field for hand washing

Personal protective equipment and clothing

- Workers should not enter a sprayed field within the re-entry period stated on the label. However, if chippers are required to enter a wet field, or a field that has been recently sprayed, then appropriate PPE should be provided and worn.
- Chippers should wear long trousers, work boots, long sleeve shirts, and gloves.

2. ERGONOMIC HAZARDS

Ergonomics involves the interaction between the human, the task and the working environment. In relation to cotton chipping, ergonomic hazards include the action of chipping with a hoe, and the manual pulling of weeds, the physical and mental demands on the workers, as well as the physical injuries and illnesses that may result from these activities.

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RISK ASSESSMENT

Nature and severity of the potential injury / illness?

- **Cuts, abrasions, infections, allergies**

Cuts and abrasions may result from being scratched by weeds, from blisters on the hands or being struck with a hoe. If left untreated, cuts and abrasions may become infected and painful.

- **Manual handling**

Manual handling problems associated with cotton chipping include:

- Back injuries
- Soft tissues sprains and strains
- Acute and chronic muscular pain
- Joint inflammation
- Tendonitis

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These injuries may result from poor technique when using a hoe, inadequate warming up of muscles, and from the bending and pulling action involved in the manual removal of weeds.

CONTROL MEASURES

Engineering / design options

- Use ergonomically designed hoes
- Use hoes that are appropriately designed for the person using it eg. correct length and weight

Safer work procedures and practices

- Use appropriate chipping techniques
- Allow no hand pulling of weeds
- Ensure that chippers receive safety induction outlining the ergonomic hazards involved in the process of cotton chipping and appropriate controls.

Personal protective equipment and clothing

Chippers should wear:

- Long trousers, work boots, long sleeve, light weight cotton shirt,
- Gloves

3. ENVIRONMENTAL HAZARDS

RISK ASSESSMENT

Nature and severity of the potential injury / illness?

- **Dehydration / heat stress**

Effects of heat stress may range from mild heat exhaustion to collapse, which may progress to heat stroke. Severe heat stroke may lead to death, particularly in older people.

- **UV / solar radiation**

The short-term effect of excessive sun exposure is sunburn – reddened skin, blistering, swelling and peeling. 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 aging of the skin, cataracts of the eye, keratoses or "sun spots" and skin cancers.

CONTROL MEASURES

Elimination of the hazard

- Use machinery with a canopy eg. row weeders, that provide shade from the sun

Safer work procedures and practices

- Chip only during the cooler part of the day
- Frequent short breaks to allow for rehydration

Ensure that chippers receive safety induction outlining the environmental hazards involved in the process of cotton chipping and correct procedures to minimise the risk.

Personal protective equipment and clothing

Chippers should wear:

- Long trousers, work boots, long sleeve, light-weight cotton shirt,
- Gloves
- Broad brimmed hat
- Sunscreen, sunglasses

4. OTHER HAZARDS

RISK ASSESSMENT

1. Who is at risk?

Cotton chippers

2. Nature of the potential injury / illness?

- **Snake bite**

The chipping season is also the time of year when snakes are more likely to be found in cotton fields. Snakebite may result in death if left untreated or not treated appropriately.

- **Road accidents**

Road accidents may result in serious injury or death. Factors that contribute to road accidents include:

- Excessive speed
- Water hazards
- Unfamiliar roads
- Hazardous road conditions eg. dust
- Livestock and native animals eg. kangaroos

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CONTROL MEASURES

Elimination of the hazard

- Have chippers reside on farm to eliminate the need for them to travel to and from town

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Substitution for a lesser hazard

- Bus chippers to the field rather than have them take individual cars

Safer work procedures and practices

- Ensure effective and well known communication systems
- Appropriate induction and training in the safe use of vehicles on the farm
- Restricted access to hazardous areas of the farm

Personal protective equipment and clothing

Chippers should wear:

- Long trousers and work boots to protect against snake bite

COTTON CHIPPING

RELEVANT LEGISLATION AND STANDARDS

State and Territory Occupational Health and Safety Acts and Regulations and/or Codes of Practice relating to Ergonomics/Manual Handling, Hazardous Substances.

REFERENCES

CES, AVCA. (1990). Health and Safety in the Field – A Guide for Cotton Chippers.

Franklin, R., Fragar, L., Houlahan, J., Brown, P., & Burcham, J. (2001). Health and Safety Risks Associated with Cotton Production On-Farm. Version 2.1. ACAHS & RIRDC: Moree.

USEFUL CONTACTS

Australian Centre for Agricultural Health and Safety

PO Box 256
MOREE NSW 2400
Tel: 02 6752 8210
Fax: 02 6752 6639

State / Territory Occupational Health and Safety Organisations

- NSW Workcover NSW Tel: 13 10 50
  www.workcover.nsw.gov.au
- VIC WorkCover Authority Tel: 03 9628 8188
  www.workcover.vic.gov.au
- QLD Division of Workplace Health and Safety Tel: 1800 177 717
  www.detir.qld.gov.au
- SA WorkCover Corporation Tel: 08 8226 3120
  www.workcover.sa.gov.au
- WA WorkSafe Tel: 08 9327 8777
  www.safetyline.wa.gov.au
- TAS Workplace Standards Authority Tel: 1300 366 322
  www.wsa.tas.gov.au
- NT Work Health Authority Tel: 08 8924 4200
  www.tbc.nt.gov.au
- ACT WorkCover Tel: 02 6205 0200
  www.workcover.act.gov.au

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This document does not, in any way, excuse a person from doing all that is reasonable and practicable to ensure the health and safety of themselves and others. Legislative requirements vary between states and territories. Therefore, it is necessary to check with the relevant state or territory occupational health and safety authority for appropriate information.