

Personal Protective Equipment: Selection, Use and Maintenance

Pesticide Safety Technical Note

Number 14

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Personal Protective Equipment (PPE) is the last line of defence against pesticide exposure. For PPE to be effective, it must be selected, used and maintained correctly. PPE includes respirators, chemically impervious gloves and footwear, washable coveralls and hats, and goggles or face shields.

Pesticide use is risky

Pesticides contain active ingredients that control pests by interfering with their natural body functions. These functions may be similar in non-target species including humans. Therefore, pesticide use presents a potential health risk. Pest control operators (PCOs) are at greater risk because they are around pesticides every day.

Pesticide exposure and poisoning

Pesticides can take the form of a solid, liquid, powder or gas. There are four main ways in which pesticide can enter the body, influenced by the form; ingestion (swallowing), inhalation (breathing), or absorbed via the skin or eyes.

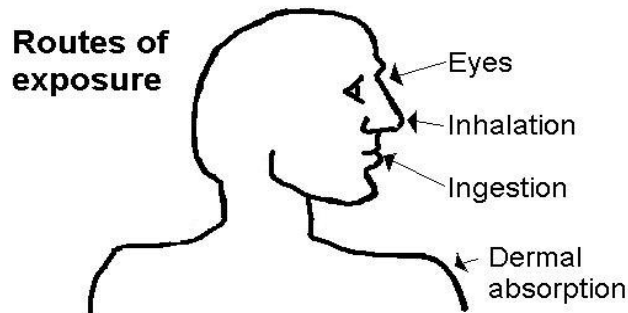


Figure 1- Routes of exposure

Poisoning as a result of pesticide exposure may occur shortly after a single exposure (acute poisoning), or gradually after repeated exposures over a period of time (chronic poisoning). The type, duration and severity of symptoms may vary depending on factors such as the type and concentration of the pesticide, the degree of exposure, and the health and age of the person exposed. In very severe cases of poisoning, seizures and unconsciousness may occur.

As pesticides are toxic and present a potential health risk, there is legislation governing their use, and precautions that should be taken in order to minimise exposure.

Risk Assessments

The Occupational Health and Safety Regulations 2017 (the Regulations) provide legislation regarding risk assessment and control of hazardous substances. The principles of risk control described in this legislation should be applied to all pesticide use, due to the potential risk involved.

The Regulations specify a four level hierarchy for controlling the risk of injury, illness or disease resulting from pesticide use:

1. **Elimination** of the risk (that is, cease pesticide use).
2. **Substitution, isolation or engineering controls** (for example, change to a less hazardous pesticide, separate people at risk from the pesticide by distance or barriers, or introduce physical controls to prevent exposure).
3. **Administrative controls** (for example insisting staff follow certain work practices to avoid exposure).
4. Using **Personal Protective Equipment (PPE)**.

PPE should only be used as a control measure when other methods are inappropriate or are inadequate by themselves. This essentially means that the use of PPE is the final line of defence against pesticide exposure. For this reason, it is vital that the correct PPE is selected for each job, that it is worn correctly, and that it is carefully maintained.

Selecting correct PPE

Each pest control operator should have their own complete set of PPE. The PPE should be selected specifically for the individual and tested to ensure it fits that person perfectly.

When selecting PPE, pest control operators should be aware that the PPE recommended is for protection against pesticide only. The job may also require protection against other hazards such as unstable ground, overhead beams in roofs, sharp objects, such as screwdrivers used to open bait stations, and fire or heat sources.

To determine the PPE that is required for each task, pest operator should:

1. Read the label and Safety Data Sheets (SDS) for the pesticide in question

Every pesticide in Australia must be registered for use with the Australian Pesticides and Veterinary Medicines Authority. A requirement of the registration process is that the pesticide has an approved label and SDS. The labels and SDSs are produced according to Safe Work Australia national codes of practice, which stipulate that appropriate PPE must be specified.

Pest control operators should carefully read and understand the PPE requirements for every pesticide that they use. If uncertain, they should speak to the pesticide manufacturer, or discuss their requirements with the PPE supplier.

Furthermore, pest control operators should remember that the PPE listed on the SDS and label is the minimum recommended by the manufacturer. If concerned about exposure, pest control operators should conduct a risk assessment and consider alternatives or additional PPE.

2. Complete a risk assessment

Complete a pesticide health risk assessment for the pesticide in question using the hierarchy as described to determine the PPE required.

3. Assess the PPE against the following checklist

- Is the PPE appropriate for the task?
- Does the item offer suitable protection from the hazard (that is, pesticides)?
- Is the item compatible with other necessary PPE? For instance, a face shield that cannot be worn correctly due to the presence of a half-face respirator is unacceptable, and alternative PPE such as a full-face respirator should be considered.
- Does the PPE suit other hazards associated with the job (for example, handling sharp objects or walking through rough terrain)?
- Is the PPE appropriate for the wearer?
- Is the item free from any sharp or hard edges, protruding wire ends, rough surfaces or similar objects that may cause harm to the user or others?
- Is it possible to put on and take off the item without difficulty?
- Can the item's closers, adjusters and/or restraint systems be operated without difficulty?
- Does the item fit? For example, PPE should not be too tight or loose and sleeve and leg length of coveralls should be appropriate.
- Does the item cover the body area intended to be protected, and is coverage maintained during movement?

- Can basic movements be carried out without difficulty? These may include standing, sitting, walking, stair climbing, raising both hands above the head and bending over.
- Does the wearer know how to select, fit and maintain the appropriate PPE?
- Can the item be worn without causing secondary illness or injury such as heat rash or dehydration?
- Does the PPE comply with Australian Standards (AS/NZS)? Items of PPE such as gloves, protective eye wear and respirators should be marked with the AS/NZS number (see Standards section at the end of this technical note for further details).

Using PPE correctly

When purchasing PPE, pest control operators should check for instructions. Where instructions exist, the person using the PPE should carefully read and understand them.

Employers should ensure that employees are adequately trained and regularly given refresher sessions.

The correct PPE must be worn when:

- handling concentrated pesticides and pesticide containers
- decanting or mixing pesticides
- applying pesticides
- entering a recently sprayed or treated area
- dealing with a spill.

PCOs should use caution when removing or putting on PPE as the outer surface may be contaminated with pesticide from prior use.

Clothing and equipment worn as PPE should only be put on immediately prior to working with pesticides. It should be washed down and removed following pesticide application, and stored in a sealed, accessible, clean and dry container. Certain items such as your respirator should be stored in their own separate, sealed container. PPE should not be worn in the driver's cabin during transit due to the risk of cross-contamination.

Maintaining PPE

Poorly maintained PPE may not provide adequate protection. When pesticides come into contact with PPE, the item can be considered contaminated.

Disposable PPE such as latex gloves or certain types of coveralls should be discarded after one use.

All other items should be cleaned after every use and can be reused provided they are in good condition. Cleaning PPE after each use will also extend its protective life.

Damage to look for includes holes in the material of coveralls and hats, particularly along seams where small tears or unstitching may begin, cracking or scratching in hard materials such as plastic goggles and respirators, and weathering and cracking of rubber on boots, gloves, face shields and respirator straps. If any damage to PPE renders the item ineffective, it should be replaced immediately.

PPE Program

If a risk assessment determines that the wearing of PPE is a necessary control measure, employers have a legal responsibility to supply that PPE to their employees. Companies should also consider establishing a personal protective equipment program (PPE Program) as part of the overall control strategy.

Section 7 of Australian Standard AS/NZS 1715 provides a full description of a PPE Program for respiratory protection. Such principles could also be adapted to other items of PPE.

The level of detail in the PPE Program will vary depending on the size of the company and the types of pesticides and PPE being used.

The PPE Program should be established by management, with one appropriately qualified person designated to take the lead. In a small company, the owner or senior supervisor could head the program. This person should develop a Standard Operating Procedure (SOP) based on:

- justification for the types of PPE selected for employees' use
- medical screening of employees to ensure they are physically and psychologically suited to wearing the PPE selected (especially with regards to respirators)
- employee PPE training program details, including proper use, limitations of equipment, the nature of the hazard and the need for protection
- the assignment of PPE to employees for their exclusive use
- instructions for proper fitting of the PPE
- regular cleaning and disinfecting of the PPE
- proper storage of the PPE
- provision for periodic inspection and maintenance of the PPE and replacement where required
- periodic evaluation by the person heading the program to assure its continued functioning and effectiveness.

The SOP should be included in the safety manual for the business.

Tips for washing contaminated clothing

- Keep contaminated clothing separate from all other household washing.
- If possible, use a separate washing machine. Otherwise, be sure to run an empty cycle after washing your contaminated clothing to clean the machine before undertaking household washing.
- Wear protective gloves while handling contaminated clothing.
- Pre-rinse contaminated clothing in the laundry trough or washing machine.
- Wash contaminated clothing in hot water with a heavy-duty detergent (not bleach). Fabric starch can also be used and is effective in removing many pesticide residues. Use the highest water level setting.
- Rinse twice using warm water rinse cycles.
- Hang the items outdoors to dry. Sunlight and fresh air will help to remove any remaining pesticide residues.

Australian Standards for PPE

All PPE must comply with Australian Standards (AS/NZS) and will often be marked with the Australian Standards logo and the corresponding number.

Respirators

AS/NZS 1715 – Selection use and maintenance of respiratory protective devices

AS/NZS 1716 - Respiratory protective devices

Eye protection

AS/NZS 1336 – Recommended practices for occupational eye protection

AS/NZS 1337 – Eye protectors for industrial applications

Protective clothing

AS/NZS 2161 – Occupational protective gloves

AS/NZS 2210 – Occupational protective footwear

AS/NZS 4501- Occupational protective clothing

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