



Occupational Health and Safety when applying insecticides to sheep

Safety tips for applying and handling chemicals

Beforehand:

- Always store chemicals in the original containers and make sure the label is intact. Regularly assess containers to ensure no leakage or corrosion has occurred.
- Secure the chemicals from unauthorised access and use. Children and visitors not familiar with the hazards of chemicals should not be able to access them.
- Read the Material Safety Data Sheet (MSDS).
- Ensure you understand and have emergency procedures defined. This should include a list of emergency contact telephone numbers such as the Poisons Information Centre (131126), your local doctor and the local fire station.

During use:

- Make sure you are very careful and precise at all times when handling chemicals. Do not cut corners when handling or applying chemicals.
- Always have appropriate clean-up procedures and equipment ready in case any chemical is spilled.
- Use soap, water and a towel to wash off any chemical splashes. Not all chemicals are water based and you may need soap to remove them from your equipment and particularly your skin.
- Be sensible in what you wear when treating sheep for flystrike. Ideally this would include: overalls, waterproof long pants; steel capped gumboots; and, elbow length waterproof gauntlets. If using products formulated as powders, breathing protection is also recommended.
- When you are handling concentrates, be extra careful of fumes and splash and wear a face shield and breathing protection.

After use:

- After use wash all equipment carefully, dry and store safely.

- Change your clothes when you have finished the chemical work. If you spill a significant volume on your clothes whilst applying chemicals, change clothes immediately.
- Wash your hands and change out of protective clothing before eating, drinking or smoking.

There is wide variation in the relative health risks associated with flystrike treatment and prevention chemicals. Powders pose a higher risk of being inhaled and they also tend to contain the highest concentration of active ingredient. Particular care should be taken when handling these products. High concentrations of organophosphates pose a major health risk. The table below provides an indication of **relative risk** associated with each major insecticide group. For specific information on safety and risks associated with any product refer to the product Material Safety Data Sheet (MSDS). A copy of the MSDS must be provided with product at time of sale. Some companies maintain product MSDSs on their website.

Chemical group	Operator health risk
Organophosphate (OP)	High
Synthetic pyrethroid	Medium
Insect growth regulator (IGR)	Low
Spinosyn	Low
Macrocyclic lactone (ML)	Low

A well publicised legal court case concerning the chronic effects of organophosphate exposure on several shearers and the recent suspension of diazinon for dipping or jetting sheep have focussed attention on the health risks associated with applying insecticides to sheep. Both the court case and the decision made by the Australian Pesticides and Veterinary Medicines Authority (APVMA) to suspend the use of diazinon for dipping or jetting sheep demonstrate that there are inherent risks with the use of all pesticides. The directions for use, restraints, safety directions and general warnings on product labels aim to mitigate

the risks as much as possible. The label is a legal document supported by legislation. It is illegal to use a product contrary to the label directions unless under permit.

The events leading to the suspension of diazinon will help explain the regulatory intervention deemed necessary by the APVMA. Diazinon was first registered in the 1950s. Not surprisingly, less information was required to support registration in the 1950s than is required today. In particular, APVMA now requires information specifically on the exposure risk to chemical users. This information did not exist for diazinon and in its absence, and in accordance with its charter, APVMA was forced to act. Wool producer advocates argued that diazinon was essential to treat or prevent infestations of external parasites of sheep and persuaded Australian Wool Innovation to commission a series of trials to generate the data required. With expertise provided by the University of Queensland and the NSW Department of Primary Industries replicated trials were conducted with sheep in NSW and Queensland in accordance with US Environmental Protection Agency Guidelines for such studies. Operators wore label recommended Personal Protective Equipment (PPE) over patches attached to under garments in numerous sites including shoulders, back, chest, upper and lower arms and legs and feet. The patches acted as target sites for diazinon splashes, sprays and droplets to measure the amounts of insecticide that penetrated the PPE and was assumed would have reached the operator's skin. Workers hand jetted sheep, ran sheep through automatic jetting races, dunked sheep in mobile or in-ground plunge dips, showered sheep in Buzzacott™ shower dips, mixed up diazinon dip solutions and cleaned down equipment after use. After each task, operators returned to a 'de-patching' station where the patches were removed and sent for chemical analysis. Results indicated an unacceptable level of exposure for workers applying diazinon solutions to sheep via jetting or dipping. Following this experimental evidence that operators of dips and jetting equipment would be exposed to unacceptable amounts of diazinon, the APVMA had no option other than to suspend the use of diazinon for these purposes.

The trials that generated the diazinon data served a second purpose. In those experiments the volume and concentration of the diazinon dipping or jetting fluids were known and the amounts of diazinon contamination arising during hand jetting or the operation of automatic jetting races, shower dips, in-ground and mobile plunge dips were measured. These figures were used to estimate the volume of 'splash' deposited on operators of these various machines. These volumes serve as a model for all products applied via these methods. When combined with data on the **No Observable Effect Limit (NOEL)** and skin absorption specific to a particular insecticide, regulators can estimate safety margins for products without the need to repeat the experiments each time.

Product labels carry specific information on PPE. Usually, cotton overalls buttoned to the neck, elbow length waterproof gloves, covered in boots and a washable hat

are prescribed. Waterproof boots, pants or apron may be required for some tasks. When handling the product concentrate a face shield and respirator with appropriate cartridges may be required. Products must be stored in a lockable shed and should only be opened and decanted outdoors in good ventilation. Most producers are required to hold a current 'ticket' (eg. Smartrain™ or ChemCert™) as demonstration of their competence and knowledge in handling pesticides.

To ensure you have the most up-to-date information, consult the APVMA database <http://www.apvma.gov.au/index.asp> which is updated nightly and contains details of all agricultural and veterinary chemical products that are registered for use in Australia.