NATIONAL Wine&Grape Industry CENTRE

MANAGING YOUR LEGAL RESPONSIBILITIES IN APPLYING PESTICIDES

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PESTICIDES ACT

The Pesticides Act 1999 is the primary legislative instrument controlling the use of pesticides in NSW and is administered by the Environment Protection Authority (EPA). The underlying principle of the Pesticides Act is that pesticides must only be used for the purpose described on the product label and all the instructions on the label must be followed. Consequently, all label directions must be read by or explained to the user prior to each use of the pesticide.

All pesticide users should take reasonable care to protect their own health and the health of others when using a pesticide. They should also make every reasonable attempt to prevent damage occurring from the use of a pesticide, such as off-target drift onto sensitive areas or harm to endangered and protected species.

Regulations are in the process of being drawn up under the Pesticides Act which will require all commercial pesticide users, ie all farmers and spray contractors, to be trained in pesticide application (the training regulation) and to keep records of their pesticide application (the record keeping regulation). These regulations will be introduced during 2000-01, with the training regulation being phased in over a period of two years. This will give untrained pesticide users two years to become trained to meet the requirements of the regulation.

HAZARDOUS SUBSTANCES REGULATION

The Occupational Health and Safety (Hazardous Substances) Regulation 1996, also known more simply as the Hazardous Substances Regulation, details legal requirements of suppliers, employers and employees in the workplace for hazardous substances management. The Regulation is intended to protect workers from both the short and long term health effects of exposure to hazardous substances and to improve current health and safety practices by:

- provision of health and safety information to workers,
- assessment of the risks arising from hazardous substances exposure, and
- control of the risks.

WorkCover NSW's *Code of practice for the safe use and storage of chemicals (including pesticides and herbicides) in agriculture* is an approved industry code of practice and provides practical guidance for farm chemical users to comply with the Hazardous Substances Regulation, Dangerous Goods Regulation and the Pesticides Act.

PESTICIDES AND WORKER SAFETY

Pesticides can have both immediate (acute) effects and chronic (long-term) effects on the health of people who are exposed to them.

ACUTE TOXICITY

The acute or immediate toxicity of a farm chemical is reflected in the Poisons Schedule or poison warnings which appear on the label of a pesticide product. The acute toxicity is assessed in terms of the potential of the active ingredient of the chemical to poison an individual by the route of exposure which is most lethal, eg oral ingestion.

POISON SCHEDULES

Pesticides are classified into four categories in the Poisons Schedule based on the acute health hazard to the user of the pesticide. Each schedule has a corresponding signal heading which appears in large contrasting lettering on the label of the pesticide product.

Table 1: Poisons Schedule

Unscheduled	Very low toxicity	No heading required
Schedule 5	Slightly toxic	**Caution**
Schedule 6	Moderately toxic	**Poison**
Schedule 7	Highly toxic	**Dangerous Poison**

The Poison Schedule will largely determine the **Safety Directions** and **First Aid Instructions** which appear on the label. The Safety Directions specify what personal protective equipment should be worn, and what safety precautions should be taken, eg do not inhale spray mist. The First Aid Instructions specify what action should be taken in the event of a poisoning. Safety Directions and First Aid Instructions may be different for different formulations of the same pesticides.

NB. Before opening and using any farm chemical, consult the label and Material Safety Data Sheet (MSDS) for specific Safety Directions. The *Hazardous Substances Regulation* of the *Occupational Health and Safety Act* requires resellers to provide end users with an MSDS.
If you suspect a poisoning, contact the **Poisons Information Centre, emergency phone (24 hr) 131126**.

ANTICHOLINESTERASE COMPOUNDS

In general, insecticides are more acutely toxic than other groups of pesticides such as herbicides and fungicides. This is because most insecticides act on the central nervous system. Of the insecticides, the most acutely toxic are the organophosphates (OPs) which depress cholinesterase enzyme activity in the central nervous system. The carbamate group of insecticides also depresses cholinesterase, but the health effects are less severe because the enzyme regenerates rapidly by itself following carbamate exposure. Nevertheless, carbamates such as aldicarb have extremely high acute toxicity and are capable of causing severe illness and death.

Products which depress cholinesterase are especially hazardous, not only because of their effect on the central nervous system, but because they are readily absorbed through the skin. These products must be identified by the words 'an anticholinesterase compound' underneath the name of the active ingredient on the product label.

The Safety Directions on the label will include advice on safe work practices and personal protective equipment (PPE) specific to anticholinesterase products. Where work practices and application technology create a high risk of exposure to anticholinesterase compounds, it may be necessary to monitor the health of those workers who are exposed. Additional details on biological monitoring and health surveillance is included in the *Code of practice for the safe use and storage of chemicals (including pesticides and herbicides) in agriculture* published by the NSW WorkCover Authority.

SOLVENTS AND DISTILLATES

In addition to the active ingredient, pesticide formulations contain surfactants and

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If you suspect poisoning, contact the Poisons Information Centre, emergency phone (24 hr) 131 126

carriers which may also be toxic. Many liquid pesticide formulations are based upon petroleum distillates or organic solvents which are corrosive to the skin and eyes, and their vapours may affect the brain if inhaled. An example of such a distillate is xylene, which is highly toxic. As with the active ingredient, the exposure risk is highest when handling the concentrate. This is why pesticide labels often carry warnings to avoid inhaling the vapours, and to avoid splashes to the skin and eyes.

ROUTES OF EXPOSURE

With **all** pesticides (except fumigants) the most hazardous route of exposure is dermal absorption (through the skin) and the most hazardous phase of application is mixing and loading the concentrated product.
Excepting fumigants, the inhalation risk for most pesticides and application technology is low. Nevertheless, a respirator may be required when mixing/loading or applying pesticides

- in an enclosed space (such as a shed),
- if the pesticide is highly volatile and liable to be breathed as a vapour (such as 2,4-D ester), or
- if application carries the risk of inhaling the spray mist (such as having to turn back into the drift in crops with short rows or hand jetting sheep).

Ingestion or swallowing is a risk to applicators who don't wash their hands before eating and drinking or who smoke during application. Unsecured storage represents a high risk to children who could accidentally ingest a pesticide.

Many pesticide formulations can have direct or topical effects on the skin and eyes. These effects are often un-related to whether or not the chemical is acutely toxic. Some pesticides may have low acute toxicity but severe topical effects. For example, glyphosate has very low acute toxicity but is irritating to the skin and eyes. Warnings regarding skin and eye irritation and other topical effects are usually found on the product label under 'Safety Directions'.

To obtain a copy of the 'Wine Industry Code of Practice for Workplace Health & Safety' contact WorkCover on 1800 653 134

RE-ENTRY INTERVALS

The re-entry interval is the time which must elapse between applying the pesticide and re-entry into the sprayed crop, unless the personal protective equipment specified for re-entry on the label is worn. The reason for setting a re-entry interval is that pesticides sometimes remain on crops in the form of foliar aerosol particles. These residues can be dislodged by contact with the crop and absorbed through the skin by those working in the crop.

Re-entry intervals only appear on the label of a small number of pesticide products. These include newer products or older products which have been subject to a technical review by the National Registration Authority. If a re-entry period is not specified on the label, the rule of thumb is to wait twenty-four hours after application or until the crop is dry, whichever is the longer. Crops should never be re-entered when wet from dew or light precipitation, irrespective of the time elapsed, unless appropriate personal protective clothing is worn.

CHRONIC TOXICITY

The effects of long term exposure to small doses of chemical is referred to as chronic toxicity. Some of these chronic toxicity effects include:

- neurotoxic effects- on the brain and central nervous system;
- reproductive;
- carcinogenic - cancer causing, and
- endocrine disruption.

NEUROTOXIC EFFECTS

Organophosphate pesticides are suspected of having long-term, subtle effects on the

central nervous system. The effects detected to date are slight and have only been detected in a tiny proportion of those exposed. What is clear is that all effects, both acute and chronic, are dose related. This means that adherence to label directions to control acute exposure will similarly control chronic exposure.

REPRODUCTIVE EFFECTS

Some pesticides are suspected of being fetotoxic (fatal to foetuses) and teratogenic (causing birth defects) on the basis of laboratory studies involving animals. However, there is little evidence that pesticides can affect human reproduction or the health of the unborn foetus at the levels of pesticide exposure which most of the population experiences through their food supply.

The Australian College of Occupational Medicine recommends that women who are pregnant or likely to become pregnant protect themselves against chemical exposures which may have adverse reproductive effects. Pregnant women should not be involved in spraying agricultural chemicals or working in recently sprayed crops. Advice on pregnancy and occupational exposure to pesticides can be sought from a medical practitioner accredited by WorkCover NSW in occupational health.

CANCER AND PESTICIDES

Despite widespread public suspicion of pesticides as cancer causing agents, evidence is lacking to implicate all but a few. As most cancers are caused by a multiplicity of factors, it is extremely difficult to determine whether or not a particular cancer was the result of pesticide exposure or other factors. Apart from the organochlorines and arsenic which are now banned, only chlorothalonil, dichlorvos and amitrole have been classified as possible (less weight of evidence than probable) carcinogens by the WHO (World Health Organisation).

ENDOCRINE DISRUPTION

The endocrine system is made up of many glands in the body and the hormones they secrete. These hormones guide the development, growth, reproduction and behaviour of all animals including humans. Some of the glands include female ovaries and males testes. Endocrine disruptors are chemicals that interfere with the normal functioning of the endocrine system. Large acute exposure to some chemicals such as the organochlorines has caused adverse effects to the endocrine systems of animals.

It is unclear whether long-term, low level exposure to endocrine disrupting chemicals will affect human reproduction. One reason why it is difficult to establish the specific effects caused by pesticides is that we are surrounded by naturally occurring sex hormones, particularly in plants. Our exposure to naturally occurring plant hormones is far greater than to synthetic ones such as pesticides - by a factor of 40 million. Nevertheless, the US Environment Protection Authority has undertaken to develop a set of tests which will help screen pesticides for their endocrine disrupting potential. These tests will also be adopted by other risk assessment agencies around the world, including Australia.

The best way to manage any long term risks of chronic pesticide effects is to reduce exposure by following all the directions on pesticide labels.

PESTICIDES AND THE ENVIRONMENT

Most insecticides are toxic to aquatic organisms, bees and birds. Fungicides and herbicides are relatively safe to bees in terms of their active ingredients, but their carriers and surfactants may be toxic. The risks that a particular product poses to the environment are reflected in statements on the label under headings like ‘Protecting wildlife, fish, crustacea and the environment’.

PROTECTING THE AQUATIC ENVIRONMENT

The risk to aquatic organisms can be managed by:

- ❖ preventing drift into surface waters during application;
- ❖ locating mixing/loading and decontaminating facilities away from surface waters and providing such facilities with bunding and sumps to prevent movement of either concentrate or rinsate into surface waters;
- ❖ installing valves which prevent back-flow when filling spray tanks from surface waters and in suction lines for chemigation systems which draw directly from surface waters;
- ❖ avoiding aerially applying spray onto fields under irrigation;
- ❖ building sufficient on-farm storage capacity (including provision for storm run-off) to contain pesticide contaminated tail water from irrigation;
- ❖ spraying in an upstream direction, when it is necessary to spray near surface waters, to reduce the maximum concentration at any one point in the watercourse;
- ❖ using only registered products to control aquatic weeds, eg Roundup Biactive rather than Roundup; and
- ❖ avoiding disposal of used containers in surface waters and on flood plains and river catchments.

PROTECTING BEES

Many pesticides are toxic to bees and can damage the productivity of hives if bees or the hives are contaminated. Some pesticides are particularly toxic to bees and are identified as such with the following special statement on the label.

Dangerous to bees.
DO NOT spray any plants in flower while bees are foraging.

The pesticide risk to bees can be reduced by:

- ❖ applying pesticides toxic to bees early in the morning or in the evening when bees are not foraging;
- ❖ notifying the apiarist when beehives are in the vicinity of crops to be sprayed to allow removal of the hives before spraying;
- ❖ where possible, using EC and granular formulations in preference to wettable powders which are particularly hazardous to bees (Micro-encapsulated formulations such as that used for methyl parathion are particularly hazardous to bees because of their persistence in the environment and because bees transport the micro-capsules back to the hive along with the pollen.);
- ❖ using ground rigs in preference to aerial application to minimise drift, especially when crops and adjacent plants are flowering; and
- ❖ avoiding drift and contamination of surface waters where bees may drink (see advice on risk management for aquatic organisms).

PROTECTING BIRDS

The organophosphate and carbamate insecticides can be particularly toxic to birds, especially in granular formulations. Bird kills from diazinon, monocrotophos and carbofuran have been well documented in Australia and overseas. Insecticidal seed dressings can pose similar risks. Just a few seeds and granules can be lethal to birds. Spillage can be very hazardous to birds as they can easily ingest a toxic dose from a small area.

Risks to birds from granular products can be managed by:

- ❖ ensuring complete incorporation beneath the soil, particularly at row ends where spillage may occur; and
- ❖ immediate clean up of spillage, however small.

Bait materials for control of rodents or soil insect pests can also be hazardous to birds, either through direct consumption of the bait or from feeding on bait affected animals or pests. The risks to birds from baits can be managed by:

- ensuring even bait distribution, with no locally high concentrations;
- not baiting over bare ground or in more open situations, such as near crop perimeters, where birds may see the baits;
- not baiting near bird habitat such as remnant native vegetation;
- use of bait stations which prevent access by birds, particularly near bird habitat;
- only baiting where pest pressure is high;
- baiting late in the evening when birds have finished feeding;
- prompt collection and burial of rodent carcases where these occur in open situations; and
- immediate clean up of spillage, however small.

Insecticide sprays can also be hazardous to birds, either because of direct contact with the sprayed chemical, or by feeding on sprayed insect pests or crops. Even where birds are not killed, they may be sufficiently affected to make them more vulnerable to predation. Contaminated seed and insects collected from sprayed fields by parent birds can also be lethal to young chicks still in the nest. Risks to feeding and nesting birds can be managed by:

- minimising drift into remnant vegetation, wildlife corridors, nesting sites, or other bird habitats;
- actively discouraging birds from feeding in crops which are to be sprayed;
- spraying late in the day when birds have finished feeding; and
- using only low toxicity chemicals when large concentrations of birds are nesting nearby.

The best way to manage any long term adverse environmental risks is to follow the protection statements on labels, minimise spray drift, and to dispose of chemical containers and waste in accord with label directions and codes of practice.

DISPOSAL OF FARM CHEMICALS AND THEIR CONTAINERS

After chemicals have been applied according to label directions, empty chemical containers and any unused chemicals have to be disposed of in an environmentally responsible manner.

DRUMMUSTER

To solve the problem of what to do with used non-returnable chemical containers, Avcare, the NFF (National Farmers' Federation), the Veterinary Manufacturers and Distributors Association (VMDA) and local government Australia wide have developed drumMUSTER.

From February 1 1999 farmers have paid a 4¢ L/kg levy on non-returnable chemical containers greater than 1L/kg. This levy funds the national collection and recycling scheme, drumMUSTER. The levy funds local government to pay staff to inspect returned containers, for processing the returned containers, and for publicising local collection sites and times.

Local councils, either individually or in groups, enter into an agreement with drumMUSTER. Farmers are then able to deliver cleaned (ie triple or pressure rinsed) containers to designated collection points run by the participating councils. At these collection points, the delivered containers are inspected and either accepted or rejected.

In the first year of the scheme, ALL clean rigid metal and plastic containers will be accepted. Thereafter, only containers with the drumMUSTER sticker, for which the levy has been paid, will be accepted.

CLEANING CONTAINERS FOR COLLECTION

When rinsing, the PPE (personal protective equipment) specified on the label for application and/or mixing and loading the pesticide should be worn. This is because the chemical remaining in a container is the concentrate, the most toxic form of the chemical, even though it is diluted during the rinsing process.

To triple rinse a container up to 20L to meet drumMUSTER standards:

- remove the cap, invert the container and allow it to drip drain into the mixing tank for 30 seconds,
- add rinse water - 20% (1L/5L) of container volume,
- replace cap and shake vigorously for 1 minute,
- remove cap, invert and drip drain into mixing tank for 30 seconds,
- repeat twice, and
- wash cap separately and replace on container.

Triple rinsing is only suitable for small containers up to 20L.

Rinsing is most effective while the containers are still moist inside. The longer residues have time to dry and cake on the inside of containers, the more difficult they are to remove. This is the reason for rinsing during mixing and loading. If rinsing is done during mixing and loading, the rinsate can be emptied into the spray or mixing tank of the application equipment, where it can be 'disposed of' on the crop. Using the rinsate in this away avoids the necessity for having to dispose of the container residues separately (see 'Disposal of rinsate or dilute chemical' below).

An alternative to manually triple rinsing small containers is a pressure rinsing nozzle. There are two main types. One type has a rotating spray head which can be used either to rinse an inverted container in the induction hopper or directly over the tank. The other type has a hardened, pointed shaft to pierce drums and the hollow shaft itself has four holes at 90^0 to spray the water around the container.

To pressure rinse a container up to 20L:

- remove the cap, invert the container and allow it to drip drain into the mixing tank for 30 seconds,
- ensure clean rinse water is between 35-60 psi,
- insert pressure rinsing probe either through container opening or through pierced base of the container (depending upon type of nozzle),
- invert container over mixing tank and rinse for 30 seconds or longer if the water coming from the container neck is not clear, moving the probe about to ensure all inner surfaces are rinsed,
- wash cap in clear rinse water from container,
- turn off water, remove probe and drip drain container into mixing tank for 30 seconds, and
- replace lid on container.

Large containers, eg 200L, are best rinsed with a chemical transfer probe which has a flushing cycle as well as the primary suction cycle. Such probes are standard on many boom sprays, and options on most others. The drums may have to be slightly inclined to ensure all rinsate is removed. Typical rinse time for a 200L drum would be 3-5 minutes.

Non-rigid containers, ie bags and cartons, have to be buried (see 'Disposal of rinsate' for conditions). Plastic bags should be rinsed first, and paper bags punctured or shredded. Cartons are also required to be punctured or shredded before burial. Burning is specifically prohibited.

DISPOSAL OF RINSATE OR DILUTE CHEMICAL

Labels contain a prohibition on disposing of concentrate on-site or on-farm, as does state environmental legislation. Unused chemical has first to be diluted and, if not applied in terms of the label use pattern, has to be disposed of in an environmentally

responsible manner, such as an evaporation pit.

The pit should be a metre deep, lined with plastic sheeting over which has been spread hydrated lime, and any wastes covered with at least half a metre of soil. Disposal pits are only suited to small volumes and for diluted chemicals. In the case of a concentrate spill, the chemical would have to be diluted to at least standard label rates before transfer to the disposal pit.

DISPOSAL OF UNWANTED CHEMICALS

In addition to unwanted chemical containers, many farms also have unwanted chemicals. To dispose of unwanted farm chemicals, the Commonwealth Government has allocated funding, matched on a dollar for dollar basis by the states, for a one-off national collection - National Collection Storage and Destruction Scheme. The collection is timetabled for 2000-02, starting late in 2000, with most activity in 2001, concluding in 2002. Collection sites will be designated in farming areas, to which unwanted farm chemicals can be brought.

As a follow-up to the one-off national collection, there will be an on-going collection scheme, Chemclear. This is an agreement between Avcare, VMDA and the NFF. Farmers will have to pay for the service, which is likely to be a contract with a waste disposer to collect unwanted farm chemicals on a routine basis.

Occasionally, manufacturers run their own return/recall schemes. These will not be covered by Chemclear as the costs will be borne by the manufacturers of the chemicals involved.

MANAGING RESIDUES RESULTING FROM PESTICIDE APPLICATION

WITHHOLDING PERIODS (WHPS)

The withholding period (WHP) is the minimum time which must elapse between the last application of a pesticide and harvest. The purpose of the WHP is to avoid residues of agricultural chemicals and their metabolites which exceed maximum residue limits (MRLs) in raw agricultural commodities and in foods for consumption by humans and animals.
Pesticides used on crops may have WHPs for both harvest and grazing.

WHPs are specific to use patterns, ie to chemical, crop and pest. WHPs are also product specific.

Harvest WHPs may vary with formulation (eg ULV or EC), rate (which may vary with the pest controlled), and whether or not the crop can be harvested green or dry.

Grazing WHPs may vary depending upon whether or not the crop is grazed/cut for stock food pre-/post-harvest.

Not all labels pick up all registered use patterns. Consequently, not all labels contain the same information on WHPs. Different labels may have different WHPs for the same use pattern.

On some labels the WHP is contained within the tables giving Directions for Use; on other labels the WHP appears separately below the Directions for Use.

Where no WHP is given on the label, do not assume that the WHP is zero. If there is no WHP, the label will contain a statement to the effect that no WHP is necessary if label directions are followed.

Where a product has no grazing WHP, crops treated with the product should not be grazed prior to harvest. In these circumstances, it is uncertain whether stock that graze the stubble or are fed by-products of the treated crop will develop detectable residues of the chemical. Where appropriate, growers are advised to contact the chemical manufacturer for advice on managing chemical residues in the crop or in stock.

EXPORT REQUIREMENTS

Some export markets either have a lower MRL than the Australian or no MRL. Exporters need to identify these requirements by checking directly with the export market. Longer withholding periods may be required for some markets, to allow the residue to decay to the required level. Export specific withholding periods for livestock are known as export slaughter intervals or ESIs. Some are shown on labels, but many are not. It is up to the individual producer to be aware of export chemical residue requirements and to amend chemical management practices accordingly.

MANAGING SPRAY DRIFT

Spray drift is the airborne movement of agricultural chemicals onto a non-target area with the potential for risk of injury or damage to humans, plants, animals, the environment or property.

For information on managing chemical application to avoid and minimise spray drift, farmers and applicators should read label directions carefully, obtain a copy of the Department's publication *Principles of Spray Drift Management* and consult with their district agronomist or horticulturist.

The successful management of spray drift will require the adoption of a range of complementary strategies including:

- the identification of sensitive areas,
- the establishment of appropriate buffer zones,
- property planning, and
- the development of effective communication between growers, spray contractors and neighbours.

SENSITIVE AREAS

Sensitive areas are those where spray drift is likely to have the greatest adverse impact, such as:

- lakes, ponds and waterways,
- wildlife habitats and wetlands,
- neighbouring houses,
- public roads (particularly those used by school buses),
- schools and other public amenities,
- travelling stock routes and reserves, and
- organic and alternative farming systems.

The potential adverse impact will be dependent upon the exact nature of the sensitive area in relation to the toxicity and formulation of the chemical.

BUFFER ZONES

Buffer zones assist in minimising drift into sensitive areas. A buffer zone may consist of fallow, pasture, a non-sprayed strip of the crop or purpose planted vegetation. Vegetative buffer zones should be sufficiently open to allow the spray to penetrate and of sufficient depth to trap the bulk of any drift.

PROPERTY PLANNING

Property plans are a tool for communicating to others, such as spray contractors and neighbours, all the factors which need to be considered when applying chemicals on the property. A property plan would include:

- houses and farm buildings,
- neighbouring properties,
- sensitive areas,
- roads and access points,
- public roads and public places,
- watercourses and storage,
- cropping and grazing paddocks, and
- powerlines and other hazards to aircraft, such as transmitter towers.

COMMUNICATION

Communicating with adjoining land users is critical to avoiding the conflict that can ensue from drift incidents. Communication can embrace:

- pre-season discussions with neighbours to identify type and location of crops to be grown, chemicals to be used and potential adverse effects on the activities of neighbours,
- notification of neighbours prior to chemical application,
- an agreement on the conditions in which chemical application will not proceed or be discontinued,

- a clearly defined process and timetable for resolving conflict which arise during the spraying season, and
- an agreed process for recourse to regulatory action, if required.

RECORD KEEPING

In addition to the requirements of the Hazardous Substances Regulation, many farmers now keep detailed spray diaries to meet the quality assurance requirements of those who buy their produce. These diaries may also assist a grower in defending himself against allegations of causing spray drift and are a valuable management tool in their own right.

The Hazardous Substances Regulation requires users of farm chemical to keep records of:

- all farm chemicals in the workplace - the minimum requirement is a list or **register**, an accompanying **MSDS** for each chemical used and a risk assessment of the on-farm chemical storage;
- all pesticide usage (see example);
- the risk assessment for each chemical used (which can be no more than an annotation on the MSDS);
- training given to employees who use or who are exposed to farm chemicals; and
- health surveillance (if warranted by the risk assessment in respect of organophosphates).

Full details of these requirement and examples of suitable record forms are given in the *Code of practice for the safe use and storage of chemicals (including pesticides and herbicides) in agriculture* published by the NSW WorkCover Authority.

The record keeping regulation being prepared for the Pesticides Act 1999 will require details to be kept on:

- product name,
- rate and quantity of product used,
- how it was applied,
- equipment used,
- description of the area treated,
- target pest,
- applicator contact details
- owner contact details,
- date/time, and
- weather before and during the application.

An example of a suitable format for recording farm chemical application is provided in appendix 1.

Appendix 1

FARM CHEMICAL APPLICATION RECORD

Applicator:…….. Date:……..

Address:……..

Owner (if not applicator):……..

Address:……..

Phone:…….. Mobile/fax:……

Paddock no:…… Paddock area:……

Time started:…… Time finished:……..

CROP ……

Variety:…….. Growth stage:……..

Growing conditions: Very Good ☐ Good ☐ Poor ☐ Very Poor ☐

Are plants stressed? Yes☐ No☐

Plant conditions: Leaves Wet ☐ Leaves damp ☐ Leaves dry ☐

Soil moisture: Wet ☐ Moist ☐ Dry surface ☐ Dry ☐

PEST SPRAYED

Weed ☐ Insect ☐ Disease ☐

Target (s) and growth stages……..

Pest density Heavy ☐ Medium☐ Light ☐

WEATHER CONDITIONS

Sky Showers☐ Overcast ☐ Light cloud ☐ Clear sky☐

Wind (before) Time:……..Direction:……Speed:…….. Gustiness:……...

Wind (change) Time:……Direction:……..Speed:……..Gustiness:……

Relative humidity: Time:……..Wet bulb:……..Dry bulb:……..RH%:……..

Temperature Daily maximum:……Daily minimum:……..

Frost ☐ Time lifted:…….. Fog☐ Time lifted:…….. Inversion ☐

Rain Before:…… After:……

Weather change during application:……..

SPRAY DATA

Product used:……

Rate/Ha:…… Additives/wetter:……..

Total litres of spray used in paddock:…… Litres of spray per Ha:……

Type of spray equipment:……

Sprayer pressure Tractor speed:……

Nozzles used:…….. Type/quality water used:……

Comments:……

……