

## Information on pesticides

One of the most difficult tasks for worker HS&E representatives is to find out about the pesticides harming their members at the workplace, and how to prevent and minimise risk to health and the environment.

The main sources of information available are the manufacturer's pesticide label, the manufacturer's product safety data sheet, employer workplace risk assessments, and scientific literature/databases.

### ACTIVITY Reading labels

#### AIMS

To help us to:

- interpret labels
- decide whether labels provide adequate information
- decide where to find further information

#### TASK

**Either:** Use a pesticides label that you brought from your workplace

**Or:** Following a complaint about a pesticide from your members, you have managed to find the label. The information provided on the label is as follows:

**Product name:** Ambush

**Hazard warning:** hazard by inhalation; avoid breathing in; keep container closed; use with adequate ventilation and PPE

**First Aid:** Ensure plenty of fresh air and call a doctor

**Further information:** contact your supplier for details of the manufacturer

In your small group, look at the information below and:

- identify what further information should be provided on the label
- list other sources of information that would help

Elect a spokesperson to report back

## What's in and on a container or packet?

Most formulated pesticide products are a cocktail of chemicals, many of which are toxic in their own right. The type of formulation can also be important in determining the toxicity of a product.

### Formulation

Most pesticides come as formulated products which are ready-to-use. The variety of formulations depends on factors such as the nature of the target species, the persistence desired, ease of application, and even lessening the toxicity of a product. Formulations include:

- dry dusts - granules dry baits - e.g. slug pellets, rodent killers
- wettable powders - diluted with water to use in a sprayer
- emulsions - liquids ready to be diluted
- emulsifiable concentrate (ec)

- suspension concentrate (sc)
- ultra low volume (ULV) - formulations for spraying in a concentrated form in small droplets using specialised equipment
- smokes - pesticides which are burnt in a confined space (slow release strips and papers - used in livestock houses, food stores and for fly control)
- aerosols

## **The make up of a formulated pesticide product**

### ***Active ingredient (ai)***

- Means the biologically active/toxic part of the pesticide product. It is the main and most important component of any product as it is this chemical which kills, or controls, the disease, insect or weed, the 'pest'. The product must contain a pesticide active ingredient(s)
- It is identified by a chemical name (which is not necessarily or usually the same as the name of the product)
- Identifying the chemical name(s) of the active ingredient(s) is **very important** as without this/these name(s) it can be difficult for the worker HS&E representative to find out further HS&E information on the pesticide

### ***Solvent***

- A chemical used to dissolve the ai(s) to make it up into liquids
- Can itself be toxic, with its own hazard classification, for example, toluene and xylene

### ***Surfactant***

- Short for surface active agent also called a wetter, spreader and sticker
- Reduces surface tension, increasing the emulsifying, spreading and wetting properties of liquid product formulations to enable the pesticide to stick to the pest or spread more evenly on plant leaves and surfaces

### ***Safener***

- A chemical which reduces the potential of a pesticide to damage a crop

### ***Adjuvant***

- A chemical added to a pesticide to increase its efficacy
- Only active in the presence of the pesticide ai, for example, piperonyl butoxide, which is added to synthetic pyrethroid insecticides to boost their activity

### ***Carrier***

- An inert solid used to dilute the pesticide ai to facilitate application

### ***Colouring & stenching agent***

- Give the formulated pesticide product an unpleasant smell and/or taste to reduce the risks of accident from swallowing the chemical
- Colouring agents are also used in seed dressings to distinguish between treated and untreated seed

- Granules are sometimes coloured to make them visible on the soil allowing application rates and correct spread to be checked

### **Active ingredient**

The active ingredient (ai) is the most important part of any product as it is this toxic chemical which kills/controls the target pest. All the other chemicals in the formulation are there to help it do this. It is **very important** to identify the active ingredient(s) in order to be able to track and find out about a pesticide.

The pesticide ai is known by a chemical name. It is important to learn to identify the chemical name (s) on the label. Do not confuse the chemical name with the product brand or trade name on the label. Brand/trade names can be hard to trace as there are hundreds of thousands of them. To complicate matters further, the companies often change product names to help sales.

Pesticide labels are not standardised so it takes some practice to be able to identify the chemical name of the ai, and to distinguish it from names of other chemicals in the formulation which may be given on the label.

The ai may also be identified by a chemical number as well as a chemical name. Identifying the chemical number makes it much easier to obtain further information on the ai including prevention and control measures. Different types of chemical number may be present on the label. Look out for the CAS number, UN registration number, EU number, or EPA number. If you are not sure which is which, note the different numbers on the label.

#### *Example 1*

Pesticide active ingredient - carbosulfan (using the chemical name) CAS No - 55285-14-8 Brand/trade name - Marshall 10G Formulation - granular, ready to use Classification - insecticide
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#### *Example 2*

Pesticide active ingredient - glyphosate (using the chemical name) CAS No - 38641-94-0 Brand/trade name - Roundup Formulation - liquid Classification - herbicide
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### **What should be on a pesticide label?**

Label information is usually stuck directly on to the container but supplementary label information may also be attached in a sealed plastic envelope. It is the responsibility of the manufacturer, formulator, importer or exporter to label the pesticide product as required by national law. The label should be in the appropriate local language(s). The quality of information on chemical labels is highly variable particularly on prevention and control measures. Generally, the label includes the following categories of information:

- Product information: trade/brand name, manufacturer/suppliers names and addresses, and emergency phone numbers, type of formulation
- Hazardous ingredients – the active ingredient(s) plus other chemicals in the formulation, all identified by a chemical name(s)
- Toxicological properties: health and environmental effects, including hazard warning symbols
- User information
- Crop/pest information
- Precautions/preventative measures/operator protection
- First aid measures

In most countries, every pesticide packet or container must, by law, have a label containing some or all of the information set out below.

### **Checklist: information required on pesticide labels**

- ✓ Product information
  - Name and concentration of each active ingredient (using the chemical name(s))
  - Commercial name of the product - the brand, or trade name
  - Type of formulation
  - Name and address of the manufacturer or importer/wholesaler or other supplier of the substance
  - Emergency phone numbers
  - Hazardous ingredients
- ✓ Name and concentration of each active ingredient (using the chemical name(s))
- ✓ Name and concentration of other ingredients, such as solvents, which could be harmful or toxic
- ✓ Toxicological properties
  - risk/safety phrases - e.g. wash concentrate from skin and eyes immediately, or wear rubber gloves, hazardous to fish etc
  - hazard warning symbol(s) - more than one symbols may be on the label; not all pesticides carry a hazard warning symbol
  - information on health effects and/or environmental impacts
- ✓ User information including:
  - directions for use
  - dose rates and mixing instructions
  - application rates
  - approved tank mixes

- ✓ Precautions/preventive & control measures/operator protection, including:
  - technical/engineering controls
  - other safety information
  - medical advice/warnings
  - washing and disposal of containers
  - personal protective equipment
  - first aid information including where to obtain medical help
- ✓ environmental protection/crop/pest information, including:
  - range of crops on which it can be used, or types of livestock
  - pest range or spectrum controlled
  - tolerant or resistant species
  - warnings on possible crop damage
  - harvest intervals

### **Material Safety Data Sheets**

Labels only give you basic health and safety information, they are not standardised, and crucial HS&E information may be missing. More comprehensive information on a formulated pesticide product can be obtained from a (product) material safety data sheet (MSD) provided by the manufacturer directly, or through the local supplier or importer of the chemical.

A Material Safety Data Sheet (MSD) is a document that contains information on the potential health and environmental effects of exposure and how to work in the safest manner with the chemical product. The MSD contains much more information than the label and is prepared and provided by the pesticide manufacturer/supplier.

The main categories of information in an MSD include:

1. Product information: trade/brand name, manufacturer/suppliers names and addresses, and emergency phone numbers
2. Hazardous ingredients active ingredient(s) etc by chemical name(s)
3. Physical Data
4. Fire or Explosion Data
5. Reactivity Data: information on the chemical instability of the product and substances it may react with
6. Toxicological Properties: health and environmental effects
7. Preventative/Control Measures
8. First Aid Measures
9. Preparation Information: who is responsible for preparation and date of preparation of the MSDS

MSDS are *not* automatically supplied with the formulated product. You will have to ask for them, often through your employer, who in turn can obtain them - free of charge - from the manufacturer, importer or supplier of the product. It is important to ask your employer for copies of MSDS to establish the principle that you have the right to receive them. In some countries, the law guarantees the right of workers to have access to - sometimes to even directly receive from companies - manufacturers' MSDS.

Organisations like the World Health Organisation (WHO), for example, also produce 'pesticide safety data sheets', but it is important to distinguish them from manufacturers MSDS which provide information on specific, formulated products. WHO-type 'data sheets' can be very useful but usually give general information on active ingredients and *not* on specific products, and should really be considered under literature/database information.

Manufacturers' safety data sheets and product labels are now often available on web sites and can be accessed by anyone with a computer with internet access. Two key webpage addresses are:

- Crop Data Management Systems : Ag Product Label and Material Safety Data Sheets Service <http://www.cdms.net/manuf/manuf.asp>
- The MSDS-SEARCH National Repository [www.msdssearch.com/](http://www.msdssearch.com/) provides free access to over 1 million Material Safety Data Sheets and over 1600 links to manufacturers

## **ACTIVITY: Finding out about pesticides**

**AIMS:** To help us to:

- use sources of information on pesticides
- find out more about pesticides

### **TASK**

The following are Brand/Trade Names of commercially available, ready formulated pesticide products:

- **Furadan** (see carbamates under health effects below)
- **Dursban** (see organophosphorous (ops) under health effects below)
- **Ambush** (see synthetic pyrethroid insecticides under health effects below)
- **Gramoxone** (see paraquat under health effects below)
- **Roundup** (see glyphosate under health effects below)

One brand/trade named pesticide product will be assigned to a small group

In your small group, use the sources of information below to find out the answers to the questions listed. Indicate the source(s) of the information for each item. Gaps in information, or information which is not easily understandable, should also be highlighted.

1. Pesticide classification - herbicide, fungicide, insecticide, other - and type of formulation?
2. Country of origin & name & address of manufacturer?
3. Active ingredient(s) - by chemical name(s), in the formulated product?
4. Any other chemical ingredient(s) in the formulated product?
5. Chemical registration number(s)?
6. Hazard warning signs?
7. Approved crops on which the pesticide can be used?
8. Types of "pests" controlled - weeds, diseases, insects etc?
9. Prevention/control & safety measures, operator protection information etc?
10. Environmental protection information?

Each group should elect a spokesperson to report back what they have found,

### **Sources of information**

1. Manufacturers product label
2. Manufacturers material safety data sheet
3. International Labour Organisation (ILO): international chemical safety cards on pesticides
4. World Health Organisation recommended classification of pesticides by hazard 2000-2002

## **Manufacturers Product/Material Safety Data Sheets**

### **Section I: Identification of product and manufacturer**

The name of the product is listed here by chemical name or by trade name. The name listed should be the same as the name that appears on the label. Hazard data sheets must also list synonyms for the product or substance. Synonyms are other names by which the substance is known.

**Manufacturer identification:** Includes manufacturer's (or supplier's) name, address, telephone number, the date the HDS was prepared and an emergency telephone number to call after business hours.

### **Section II: Hazardous ingredients**

For products which are mixtures, only those ingredients that appear on specified lists of hazardous chemicals and which make up one per cent (1%) or more of the product need to be listed. Cancer causing substances are an exception and must be listed if they make up one-tenth of one per cent (0.1%) of the mixture. The hazardous ingredients must be listed by their chemical names. For each listed ingredient, the concentration limit to which you may be exposed must be indicated.

### **Section III: Physical data**

This section lists boiling point, vapour pressure, vapour density, melting point, appearance, odour, etc. The information in Section III helps you to understand how a chemical behaves and the kind of hazard it presents.

### **Section IV: Fire and explosion data**

Section IV lists the flashpoint and flammable or explosive limits, and tells you how to extinguish a fire. The information in this section is needed to prevent, plan for and respond to chemical fires and explosions.

### **Section V: Reactivity data**

Section V tells you whether or not the substance is stable and, if it is not, what hazards the instability presents. Section V lists incompatibles (substances which must not be placed or used together). This information is important for proper storage and handling of the product.

### **Section VI: Health hazard data**

Routes of entry (inhalation, skin absorption or ingestion), acute and chronic health effects, signs and symptoms of exposure, whether the product causes cancer, medical problems made worse by exposure, and recommended first-aid/emergency procedures are all supposed to be listed under Section VI.

### **Section VII: Precautions for handling**

Information needed to devise emergency response plans, clean-up procedures, safe disposal methods and necessary storage and handling precautions must be detailed in Section VII. Frequently, however, manufacturers sum up this information with simple (and inadequate) statement such as "Avoid breathing vapour" or "Avoid skin contact".

### **Section VIII: Control measures**

Recommended methods of hazard control including ventilation, work practices and personal protective equipment (PPE) are detailed in Section VIII.

The type of respirator and the most resistant protective clothing and glove material for the product should be named. However, this information is often incomplete.

Rather than recommend the most resistant protective material, the HDS may simply state that "impermeable" gloves and clothing should be used.

## **Risk Assessments**

In many countries a new source of information available to workers exposed to pesticides is the workplace risk assessment. The employer has to carry out a risk assessment before workers use or are exposed to pesticides, and which sets down the risk prevention and/or control measures the employer should put in place to protect workers and the environment (See the sub section 'Improving pesticide health and safety below).