Information Sheet

10.3 Herbicide toxicity

In agriculture, herbicides are used for the control of undesired vegetation by causing plant death. Herbicides are not only toxic to desired plants, but could also be harmful to humans and animals, therefore herbicide toxicity is the ability of a herbicide to cause damage or illness at different dosage levels to non-target species. Toxicity of herbicide to humans and animals is determined by the LD50 (lethal dose). The LD50 is used to measure the acute toxicity of a chemical, which is the amount of chemical/substance required to kill 50% of the test population. LD50 is measured in mg of chemicals administered per kg of body weight. The lower the LD50 value, the less chemical required to cause toxicity. There are two types of herbicide toxicity - acute and chronic toxicity. Acute toxicity occurs from a single dose and chronic toxicity occurs after repeatedly being exposed to low levels of chemicals over an extended period.

To minimise the harmful toxic effect on non-targeted plants, humans and animals, all herbicides are marked with a mandatory product label. The herbicide label is considered a legal document and is, therefore, enforceable, it will be a violation to use an herbicide product in a manner inconsistent with its labelling. The herbicide label should be a clear and simple method to inform herbicide retailers and users about the type of herbicide and its mode of action group. The information provided on the label includes the product trade name, common names of active ingredients, the content of all active ingredients, application timing, dosage, storage, precautions, mixing instructions, name and address of licence holder/manufacturer, date of manufacture, the registration number and the word registered to indicate that the herbicide is registered.

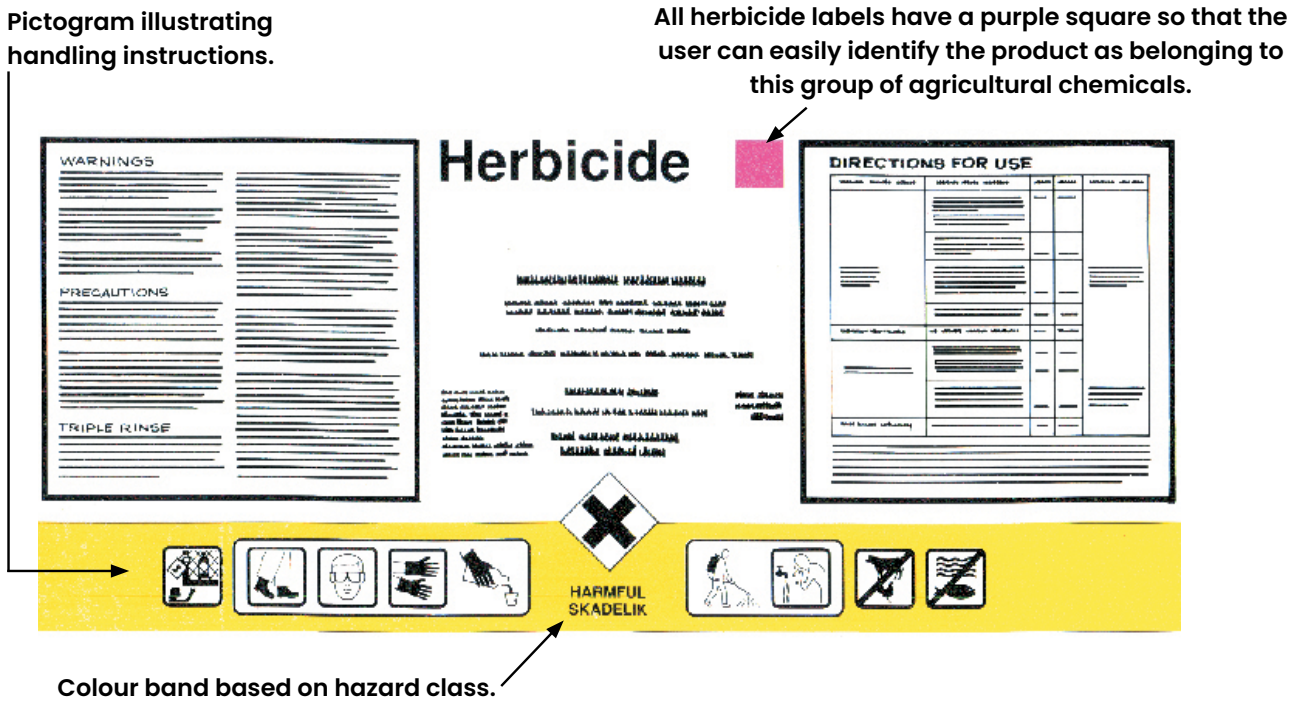

Figure 1: An example of an herbicide label.

In addition, the label informs the user about the hazards of the herbicide with product warnings and precautionary symbols, first aid information and safety pictograms. A full list of pictogram descriptions is given below. Additional safety information such as how to manage cases of overdosage, spills or skin contact, first aid measures and precautions will be detailed in the material safety data sheets (MSDS). It is important that the label and MSDS are read and understood before using the herbicide.

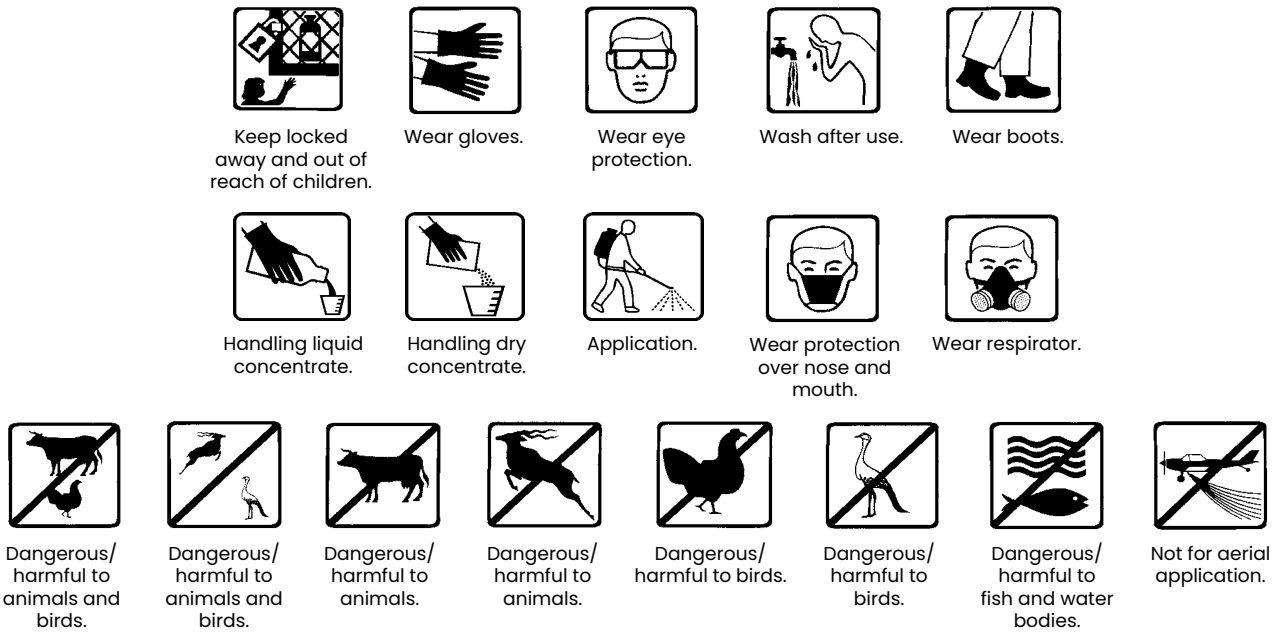

Figure 2: Pictograms and descriptions.

(Information for this article has been supplied by AVCASA)

On the bottom of the herbicide label, the hazard colour coding is used to group herbicides according to the toxicity hazard class to which they belong, and each has a different colour code. Red, yellow, blue and green bands on labels represent varying degrees of danger, with red being the most hazardous and green the least (Table 1).

Table 1: Hazard colour coding herbicide classification

Hazard colour coding herbicide's classification				
Class	**Description**	**Colour band**	**Symbol**	**Category**
Ia & Ib	Extremely hazardous	Red		Danger
II	Highly hazardous	Red		Danger
III	Moderately hazardous	Yellow	n/a	Harmful
IV	Unlikely to pose acute hazards	Green	n/a	Caution

The pictograms in the colour bands cover the basic do's and don'ts of handling, mixing, application and storage of chemicals. The pictograms within a box to the left of centre (see A) advise on the handling of the concentrated product. The pictograms in a box to the immediate right of centre (see B) advise on the application of the diluted spray mixture. Further pictograms for storage advice (C), and other specific warnings (D) are located to the extreme left and right in the colour band respectively.

Figure 3: Herbicide colour band and pictograms denoting the handling, mixing, application and storage of chemicals.

To practice safe herbicide use and reduce toxicity of the herbicide to humans, animals and non-target plants, the follow steps can be followed:

- Read and understand the label and MSDS.
- Wear correct PPE when handling and working with the herbicide, as stated on the herbicide label.
- Avoiding spray drift onto other crops, rivers, dams, or areas not under treatment.
- Clean spray and mixing equipment before and after usage.
- Disposing of used chemical containers by rinsing the container three times and puncturing the container followed by safe disposal.
- Washing face and hands thoroughly with water and soap after usage.
- Cleaning of PPE.
- Storing chemicals safely in a well-ventilated locked area.
- Not eating, drinking or smoking when handling or working with herbicides.
- Educating yourself and your team before handling, applying, and storing herbicides.

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