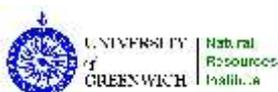




Hazard Profiles of Registered Pesticides in Ghana



This information note aims to provide guidance to Agricultural Extension Agents and farmers on principal criteria used by International Conventions to regulate pesticide use and creation. The note will assist them in making informed and appropriate decisions regarding which pesticides should or should not be available for purchase, distribution and use within their mandate areas.

Globally Harmonized Systems (GHS)

The Globally Harmonized System (GHS) of classification and labelling of chemicals defines and classifies hazards associated with chemical products, communicating health and safety information via labels and safety data sheets.

Multiple hazard classifications exist. The GHS was therefore created by the United Nations as an international system to unify classification and labelling of chemicals. To date, some countries have adopted the GHS on compulsory or voluntary basis while others are preparing legislature to adopt it.

According to the GHS, pesticide labels should carry the following hazard and safety information:

Hazard symbols	Hazard colour band
Signal words	Tactile warnings in braille
Hazard statement(s)	First aid and medical advice
Precautionary statements or warnings	Product or user category
Precautionary pictograms	Accidental spills advice

Hazard Symbols

The GHS hazard symbols (See Plate 1) are classified into 3 descriptive groups:

- Physical Hazard (17 classes) includes explosives, flammables, oxidizing agents, compressed gas and corrosives (to metals).
- Health Hazard (10 classes) includes toxic, corrosives (to skin), irritants (to skin, eye or respiratory tract), cancer causing, and gene mutants.
- Environmental Hazard (2 classes) includes chemicals that exhibit aquatic toxicity and those that are hazardous to the ozone layer.

These symbols appear on the outer labels of chemical containers to warn users of the possible hazards they can cause to humans, other unintended organisms and the environment in general. Understanding these symbols will go a long way to ensure informed decisions in the procurement and use of the chemicals.

<p>Health Hazard</p>  <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	<p>Flame</p>  <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 	<p>Exclamation Mark</p>  <ul style="list-style-type: none"> • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
<p>Gas Cylinder</p>  <ul style="list-style-type: none"> • Gases Under Pressure 	<p>Corrosion</p>  <ul style="list-style-type: none"> • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals 	<p>Exploding Bomb</p>  <ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides
<p>Flame Over Circle</p>  <ul style="list-style-type: none"> • Oxidizers 	<p>Environment (Non-Mandatory)</p>  <ul style="list-style-type: none"> • Aquatic Toxicity 	<p>Skull and Crossbones</p>  <ul style="list-style-type: none"> • Acute Toxicity (fatal or toxic)

Plate 1: Hazard symbols under the Globally Harmonized System

Precautionary Pictograms

Pictograms are embedded in the hazard colour band on chemical labels to act as a warning prompt and guidance to users (See Plate 2). Unlike in Plate 1, messages explaining each pictogram are not included on the label, so thorough knowledge and understanding of precautionary pictograms by all users is vital. An example of where pictograms have been misinterpreted is where farmers, instead of being prompted to wear appropriate Personal Protective Equipment (PPE) have instead interpreted the pictogram as suggesting that only men should be the applicants of the chemical.

Type	Pictogram and message		
Storage pictograms	 Keep locked away and out of reach of children		
Activity pictograms	 When handling liquid concentrate...	 When handling dry concentrate...	 When applying pesticide...
Advice pictograms	 Wear gloves	 Wear eye protection	 Wear rubber boots
	 Wear protection over nose and mouth	 Wear respirator	
	 Wear overalls	 Wear apron	 Wash after use
Warning pictograms	 Dangerous/harmful to animals	 Dangerous/harmful to fish- do not contaminate lakes, rivers, ponds or streams	

Plate 2: Precautionary pictograms with messages that appear on labels

Hazard Colour Bands

Four colour bands are used to describe the toxicity level associated with a chemical. These, along with their category are described in Table 1.

Toxicity level is described as the amount of chemical which can be swallowed or exposed to the skin (both human and other) before serious damage is caused. Table 1 therefore indicates that all pesticides are dangerous, including those with a green colour band. Pesticides must therefore be handled with extreme care.

Table 1. Hazard colour band, toxicity level and associated remarks

Colour band				
Toxicity level	Extremely toxic	Highly toxic	Moderately toxic	Slightly toxic
Hazard category	Highly hazardous	Danger	Warning	Low hazard
Remarks	A very small amount, usually up to 50 mg/kg of one's body weight when swallowed or up to 200 mg/kg that touches the skin can cause fatalities.	Amounts usually up to 300 mg/kg of body weight when swallowed or up to 1000 mg/kg that touches the skin may cause fatalities.	Amounts usually up to 2000 mg/kg of body weight when swallowed or touches the skin may be harmful.	Amounts usually up to 5000 mg/kg of body weight when swallowed or touches the skin may be harmful.

There are 159 active ingredients (AIs) on Ghana's February 2017 registered pesticide list. Thirty of them fall under the highly hazardous pesticide category; 44 are classified as dangerous; 68 carry a warning; and 9 are classified as posing a low hazard.

Highly Hazardous Pesticide (HHP)

Highly hazardous pesticides (HHPs) are those known to present particularly high levels of acute or chronic (long lasting) hazards to health or the environment according to internationally accepted classification systems. Most agricultural fumigants fall in this category. They are Ozone Depleting Substances (ODS). An example is Methyl bromide that is widely used to control soil and storage pests and also in fumigating vehicles/vessels at entry points for quarantine purposes. Other AIs in HHPs that are not necessarily fumigants but used in agriculture are abamectin, aluminium phosphide, beta-cyfluthrin, carbofuran, chlorfenvinphos, mancozeb, Benlate (benomyl).

There are 7 Criteria used to assess AIs in HHPs.

- HHP 1: Acute toxicity (Very poisonous)
- HHP 2: Carcinogenicity (Cancer causing)
- HHP 3: Mutagenicity (Causing mutation of genes)
- HHP 4: Reproductive toxin (Damages sperms, eggs and foetuses)
- HHP 5: Persistent Organic Pollutants – POPs (Stockholm Convention, May 2004)
- HHP 6: Requires Prior Informed Consent on export/import – PIC (Rotterdam Convention, Feb 2004)
- HHP 7: Ozone Depleting Substance – ODS (Montreal Protocol of 1987)

An assessment of the registered pesticides in Ghana as of February 2017 using this criteria revealed that, of the 30 AIs classified as HHPs, 9 are either extremely or acutely toxic; 14 are cancer causing agents; 1 can cause gene mutation; 8 are reproductive toxins and 1 (Carbofuran) requires prior informed consent (PIC) on export or import according to the Rotterdam Convention that came into force from May 2004. There are no persistent organic pollutants (POPs) or ozone depleting substances (ODS) on Ghana's registered pesticide list of February 2017.

Take Home Messages

- Pesticides are poisonous and must be handled with extreme care.
- The hazards posed by chemicals are indicated on the labels in words and symbols. One has to be conversant with these symbols to be aware of the precautions given by the manufacturers.
- Before taking a decision on the type of chemical to purchase, stock or use, get an assessment of the hazard profile of its constituent active ingredients.
- Agri-input dealers should be enlightened and persuaded to trade more in less hazardous pesticides and bio-control products.
- Farmers must be informed and encouraged to reduce dependence on chemical pest control products and adopt more biological, cultural and other environmentally-friendly options in crop production.

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