MSU Extension Publication Archive

Archive copy of publication, do not use for current recommendations. Up-to-date information about many topics can be obtained from your local Extension office.

How to Read A Chemical Product Label
Michigan State University Extension Service
Alice E. Marczewski and Michael Kamrin, Center for Environmental Toxicology
Reprinted  February 1987
12 pages

The PDF file was provided courtesy of the Michigan State University Library

Scroll down to view the publication.
HOW TO READ A CHEMICAL PRODUCT LABEL

Alice E. Marczewski and Michael Kamrin
Center for Environmental Toxicology
Michigan State University

There is a wide variety of household products we use everyday for almost every imaginable purpose — from cleaning whitewall tires to killing pests on houseplants. All of these different products have one thing in common. They are made of chemicals. Either singly or in a mixture any chemical is potentially hazardous.

These hazardous products — cleaning agents, detergents, polishes, stripping compounds, pesticides and many others — are required by law to meet specific label requirements. These requirements provide you with the information you need to protect yourself, others, pets and the environment. For maximum protection, this label should be consulted before buying, using, storing or disposing of any hazardous products.

What Is A Hazardous Household Product?

A "hazardous substance" is defined in federal government regulations as one which may cause personal injury or illness during any customary or reasonable foreseeable handling or use.

Any household product containing a "hazardous substance" is what you should regard as a hazardous household product.

There are two categories of hazardous household products and two specific sets of federal regulations for their labels:

1. products containing pesticides which are toxic, regulated by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); and
2. products containing hazardous substances (other than pesticides), which can be toxic, corrosive, irritant, flammable or radioactive, regulated by the Federal Hazardous Substances Act (FHSA).

How Can I Tell If The Products I Buy or Use Are Hazardous?

READ THE LABEL!!!!

Everything that is on the label of a hazardous product is there for a reason.

Products containing "hazardous substances" are required by the federal laws mentioned above to bear a label of specific size and containing certain information depending on the toxicity of the product or hazard presented by the product.

The following two sets of guidelines will help you to understand product labels so that you can avoid any hazards associated with products in either of the two categories of hazardous household products.
Table 1. TOXICITY RATING SCALE FOR PESTICIDES

IF THE LABEL HAS THIS SIGNAL WORD .......................YOU KNOW THAT THIS IS HOW TOXIC THE PRODUCT IS.

<table>
<thead>
<tr>
<th>Category</th>
<th>Signal Word required on label</th>
<th>LD₅₀ rat-oral mg/kg</th>
<th>Approximate amount needed to kill an average person</th>
<th>Oral, inhalation or dermal toxicity</th>
<th>Skin and eye local effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>I highly toxic</td>
<td>DANGER-POISON</td>
<td>LESS than 50</td>
<td>a few drops to one teaspoon</td>
<td>Fatal (poisonous) if swallowed (inhaled or absorbed through skin). Do not breathe vapor (dust or spray mist). Do not get in eyes, on skin or on clothing. (Front panel statement of practical treatment required.)</td>
<td>Corrosive, causes eye and skin damage (or skin irritation.) Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful or fatal if swallowed. (Appropriate first aid statement required.)</td>
</tr>
<tr>
<td>II moderately toxic</td>
<td>WARNING</td>
<td>50-500</td>
<td>1 teaspoon to one ounce</td>
<td>May be fatal if swallowed (inhaled or absorbed through the skin). Do not breathe vapors (dust or spray mist). Do not get in eyes, on skin or on clothing. (Appropriate first aid statements required.)</td>
<td>Causes eye (and skin) irritation. Do not get in eyes, on skin or on clothing. Harmful if swallowed. (Appropriate first aid statement required.)</td>
</tr>
<tr>
<td>III slightly toxic</td>
<td>CAUTION</td>
<td>over 500</td>
<td>over one ounce</td>
<td>Harmful if swallowed (inhaled or absorbed through the skin.) Avoid breathing vapors (dust or spray mist. Avoid contact with skin (eyes or clothing). (Appropriate first aid statements required.)</td>
<td>Avoid contact with skin, eyes or clothing. In case of contact, immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.</td>
</tr>
<tr>
<td>IV not toxic</td>
<td>none required</td>
<td></td>
<td></td>
<td>No precautionary statement required.</td>
<td>No precautionary statement required.</td>
</tr>
</tbody>
</table>
HOW TO READ A PESTICIDE PRODUCT LABEL

The labeling of a pesticide product is much more complicated than most other chemical products. This is necessary because many pesticides are more toxic than other chemicals found around the home, so warnings, use specifications and directions must be much more complete and appropriately detailed.

The definition of a “pesticide” is a “product that will kill a living organism defined by man to be a pest.” Thus, insecticides, herbicides, rodenticides, fungicides, etc. are made to be toxic — they are designed to kill specific undesirable living things. Therefore, some may also be hazardous to people.

You can tell the toxicity of a pesticide product by looking at the signal word on the label. The other important things a pesticide label is required to tell you is proper use, storage, handling and disposal of the pesticide and its container. Following all label directions will prevent injury to desirable plants and animals, prevent occurrence of chemical residues and protect the environment.

WHAT THE SIGNAL WORD TELLS YOU

In order to establish how dangerous a pesticide is and predict its toxicity to man, it is tested on experimental animals such as mice, rats, guinea pigs and dogs. One of the more commonly used measures of toxicity is the LD50. The LD50 is the lethal dose for 50% of the animals tested (or the amount of chemical that kills 50% of the animals to which it was given.)

Based on the LD50 and other tests, the product is classified into Toxicity Categories. The Toxicity Category I, II, III or IV indicates how hazardous the chemical or product is. (Category I is the most toxic, IV the least toxic.)

The precautionary statements required on the label, as well as the signal word required on the label are different for each of these four categories. The TOXICITY RATING SCALE shown in Table 1 indicates the requirements for pesticide labels.

Figure 1 shows a fictitious pesticide product label and indicates all of the legal label requirements. Notice that it falls into Toxicity Category III according to the Toxicity Rating Scale on page 2 and has the appropriate signal word — “CAUTION”, and the appropriate precautionary statements on the label.
The instructions on the label must tell you how to avoid the hazards the product poses. Within the precautionary statement or elsewhere on the label, emergency first aid measures must be stated. The label must also state what types of exposure require medical attention.

**PRECAUTIONARY STATEMENTS**

**Hazards to humans (and domestic animals):** This section will tell you in what ways the product may be poisonous. It will also tell you how to avoid poisoning, such as protective clothing or ventilation requirements. If the pesticide is highly toxic, this section must inform physicians of the proper treatment for poisoning.

**Physical and chemical hazards:** This section will say how to apply the product properly, in what form the product should be applied, how much to use, where it should be applied, when it should be applied, how frequently it should be applied, how soon the crop may be used or eaten after the product is applied.

**Environmental hazards:** If used improperly, pesticides or pesticide residues may contaminate water supplies, accumulate to dangerous levels in the environment or may harm birds, fish or wildlife. To avoid these problems the label may contain environmental precautions applying to air, water, soil or wildlife.

**DIRECTIONS FOR USE**

The instructions on the label must tell you how to use the product properly within its legal requirements to get the best results. The directions will tell you:

- The pests the product is registered to control.
- The crops, animals or other items the product can be used on.
- In what form the product should be applied.
- How to apply the product.
- How much to use.
- Where it should be applied.
- When it should be applied.
- How frequently it should be applied.
- How soon the crop may be used or eaten after the product is applied.

**NAME AND ADDRESS OF MANUFACTURER**

The name and address of the company that made or distributed the product must be on the label. This way the purchaser of the product knows who made or sold the product and can contact them, if necessary.

**REGISTRATION AND ESTABLISHMENT NUMBERS**

Every pesticide on the market must be registered with the federal government with the Environmental Protection Agency. The registration number must be on the front panel of the label and is written as “EPA Registration No. XXXX.” The establishment number, which is a code for what factory made the chemical, must also be on every pesticide container. It usually appears under the registration number.
FORMULATION
may be available in more than one type of formulation.
Wettable powders, emulsifiable concentrates, dusts and
powders require different methods of application.
The label will say what type of formulation the package
and how to use it properly.

NAME OF THE PRODUCT
Brand Name
The name, brand or trademark is plainly
on the front panel of the product label. The brand name
is the name used in ads by the company that makes the product
and is the most identifiable name for the product.

Common Name
All chemicals have a scientific name. Many times chemicals with a complex
scientific name are also given a simpler common name. Both the scientific and
common name do not vary between companies. The brand name will be
different depending on which company made the chemical.

INGREDIENT STATEMENT
Every pesticide label must list what is in the product. It must show the percent
that is the active ingredient and the percent that is inert ingredient. The name of
the active ingredient must also be listed and can be shown either by chemical
name or common and chemical name. The inert ingredients do not need to be
named.

CHILD HAZARD WARNING
Every pesticide container must bear the
statement “KEEP OUT OF REACH OF
CHILDREN” on the front label.

NET CONTENTS
The label must show how much product
is in the container. This can be expressed in ounces, liters, pounds or
other units.

MISUSE STATEMENT
Chemical companies are required by law to do
extensive testing on a product before it may be placed
on the market. They must meet all labeling require-
ments and prove that labeling information is correct. To use a pesticide product in any manner inconsistent with its labeling is a violation of federal law. You are reminded of this in the misuse statement.

Figure 1. REPRESENTATIVE PESTICIDE PRODUCT LABEL
HOW TO READ A HOUSEHOLD CHEMICAL PRODUCT LABEL

The hazards posed by household chemical products other than pesticides include hazards other than toxicity alone. The Federal Hazardous Substances Act establishes that a hazardous substance is one which is toxic, corrosive, irritant, flammable or radioactive. All of these properties of the household chemical product determine how the product is labeled.

The labels of household products containing hazardous substances must bear at least the following information:

**Signal Word**
The signal word "DANGER" on substances which are extremely flammable, corrosive or highly toxic.

On those substances which are highly toxic, the additional word "POISON" must be included.

The signal word "WARNING" or "CAUTION" on all other hazardous substances.

**Common and/or Chemical Name**
A list of the common names of the hazardous ingredients; if a hazardous substance has no common name, the chemical name will be listed. Both names may appear on the label, as in this case.

"Sodium Hypochlorite" is the chemical name.

"Bleach" is the common name.

**Name and Address of Manufacturer, Distributor, Packer or Seller**

**Description of Hazard**
A description of the principal hazards involved in using the product must be included on the label. In this case, the product is an IRRITANT to the skin, eyes and to the gastrointestinal system, if swallowed. Other words that may be used to describe the principal hazard in using other products may include "Vapor Harmful", "Flammable", "Corrosive", "Absorbed Through the Skin" and such.

**Precautions**
The label must have a statement of what to do to avoid the hazard.

**Instructions for Safe Handling and Storage**

**First Aid Instructions, when Necessary or Appropriate**

The Statement, "KEEP OUT OF REACH OF CHILDREN"
CAUTION: KEEP OUT OF REACH OF CHILDREN (See Back Panel for Other Cautions)

Signal Word

The statement “KEEP OUT OF REACH OF CHILDREN”

Precautions

CAUTION BRITE may be harmful if swallowed or may cause severe eye irritation if splashed in eyes. If swallowed, feed milk. If splashed in eyes, flood with water. Call Physician. Skin irritant; if contact with skin, wash off with water.

DO NOT USE BRITE with AMMONIA or products containing ACIDS such as TOILET BOWL CLEANERS, RUST REMOVERS, or VINEGAR. To do so will release HAZARDOUS GASES. Prolonged contact with metal may cause pitting or discoloration. DO NOT USE THIS BOTTLE FOR STORAGE OF ANY OTHER LIQUID BUT BRITE.

First Aid Instructions

Instructions for Safe Handling and Storage

Name and Address of Manufacturer

THE BRITE COMPANY, BARGESTON, WISCONSIN, 53145 MADE IN USA EPA REG. NO. 0353675

Description of Hazard

DO NOT USE THE BRITÉ "Guide to Cleaner Laundry" booklet or other information on laundry and house cleaning to the BRITE Company P.O. Box 12345 Braselin, Wisconsin, 53145

FOR USE ON THE FOLLOWING FABRICS: Cotton, linen, synthetics, permanent press and all color-fast fabrics. Do not use if garment label says "Do Not Bleach." Do not use BRITE on silk, wool, rayon, leather, spandex, or non-color-fast fabrics.

First Aid Instructions

Instructions for Safe Handling and Storage
The label is your guide for safe use, storage, handling and disposal of a product. However, you may have questions that are not adequately answered on the label. For more complete information about disposal of hazardous wastes, see Center for Environmental Toxicology publication, "Household Hazardous Wastes."

For your own safety and for the protection of others and of the environment, do not hesitate to seek explanations to questions you may have about any chemical product you buy. The following sources may be able to help you:

For Information About a Specific product:
Contact the Company that makes the product. They are in business to serve you. The company's phone number is frequently on the product label.

For General Information and Referrals:
Your County Cooperative Extension Service Office
(listed under your county in the phone book)
or
Center for Environmental Toxicology
Michigan State University
East Lansing, MI 48824
(517) 353-6469

For Questions About How to Dispose of Hazardous Wastes:
Michigan Department of Natural Resources
Office of Hazardous Waste Management
(517) 373-2730

For Questions Relating to Health Problems Related to Environmental Toxicants:
Michigan Department of Public Health
Center for Environmental Health Sciences
(517) 373-8050

For Questions About Pesticides and Other Agricultural Chemicals:
Michigan Department of Agriculture
Office of Toxic Substances and Emergency Services
(517) 335-8350

In Case of Human Poisoning, Call Your Local Poison Control Center, Your Physician, or:
1-800-632-2727 (State Poison Control Center in the Lower Peninsula)
1-800-562-9781 (State Poison Control Center in the Upper Peninsula)
494-5711 (Metro Detroit) Regional Poison Control Center, Detroit
1-800-462-6642 (from area code 313) Regional Poison Control Center, Detroit
1-800-572-1655 (from all other areas in Michigan) Regional Poison Control Center, Detroit
<table>
<thead>
<tr>
<th>Name of Product</th>
<th>Date Purchased</th>
<th>Storage Location</th>
<th>Important Precautions</th>
</tr>
</thead>
</table>

HAZARDOUS PRODUCT INVENTORY

MSU is an Affirmative Action/Equal Opportunity Institution. Cooperative Extension Service programs are open to all without regard to race, color, national origin, sex, or handicap.

Issued in furtherance of Cooperative Extension work in agriculture and home economics, acts of May 8, and June 30, 1914, in cooperation with the U.S. Department of Agriculture. W.J. Moline, Director, Cooperative Extension Service, Michigan State University, E. Lansing, MI 48824.

This information is for educational purposes only. Reference to commercial products or trade names does not imply endorsement by the Cooperative Extension Service or bias against those not mentioned. This bulletin becomes public property upon publication and may be reprinted verbatim as a separate or within another publication with credit to MSU. Reprinting cannot be used to endorse or advertise a commercial product or company.

5M(Reprint)2:87, TCM-SP, Price 40 cents.