



# Pesticide Risk Assessment: Understanding Signal Words on Pesticide Labels

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The U. S. Environmental Protection Agency (EPA) has oversight for registering pesticides. More than 1,000 active ingredients used in many thousands of pesticide formulations have been registered. The following information will help you understand and reduce risks when using pesticides.

### How Is Pesticide Risk Determined?

The EPA assesses risk by looking at the *toxicity* of the pesticide and the *likelihood that you will be exposed* to that pesticide. Simply put,

$$\text{RISK} = \text{TOXICITY} \times \text{EXPOSURE}$$

Toxicity is the degree or extent to which a substance is poisonous. If a substance is highly toxic but the likelihood of anyone coming into contact with it is low, then the risk is low. Similarly, if the substance has a very low toxicity and there is a very high likelihood of many people being exposed to it, the risk is still low.

Most pesticides have some level of toxicity. After all, these substances are designed to control pests, in many cases by killing them. There is also a certain risk of exposure to pesticides, since they are applied to our living environment. It is this combination of toxicity and exposure that creates risk from pesticide use.

### How Could I Be Exposed to Pesticides?

Exposure to pesticides can occur by several different methods. They are:

- Inhalation: breathing in pesticides.
- Dermal: absorbing pesticides through the skin.
- Oral: ingesting pesticides through the mouth.

Additional ways that pesticides enter the body include absorption through the eyes and through open wounds, such as cuts or scrapes.

### How Do Labels Help Me Assess Toxicity?

The U.S. Environmental Protection Agency has specific requirements for pesticide labels. One of the requirements is a prominently displayed signal word that indicates the relative level of acute toxicity (single dose exposure) for that particular formulation of pesticide. Signal words are not used to indicate chronic toxicity or long-term effects of multiple exposures. Signal words generally fall into four categories, from greatest to least toxic: DANGER - POISON, DANGER, WARNING and CAUTION (see table below).

DANGER – POISON are the signal words used for the most toxic compounds. DANGER-POISON indicates that the pesticide is highly toxic and can cause acute illness or death if exposure occurs

Signal Word	Toxicity
<b>DANGER – POISON</b>	Extremely toxic compounds when consumed, inhaled or absorbed through the skin or eyes, etc. (must have skull and crossbones symbol on label). Fatal at very low doses.
<b>DANGER</b>	Extremely toxic compounds that are corrosive and may cause irreversible skin and eye damage.
<b>WARNING</b>	Products with moderate toxicity. These products can cause moderate eye or skin irritation.
<b>CAUTION</b>	Slightly toxic; may cause slight eye or skin irritation.

orally (by mouth), dermally (through the skin), via inhalation (breathing) or through the eyes. Death may occur after oral ingestion of only a few drops to a teaspoon of the product.

**DANGER** (without the word **POISON**) indicates that a product is corrosive and very damaging to the skin and eyes.

**WARNING** is the signal word for moderately toxic products. About 1 teaspoon to 1 tablespoon of the product may result in death. Other effects include moderate illness or injury to eyes or skin.

**CAUTION** indicates the least-toxic products. The lethal dose of a product labeled “Caution” ranges from 1 ounce to 1 pint. Other effects include illness or injury to eyes or skin.

### **What Can I Do to Reduce My Risk of Exposure or Injury When Applying Pesticides?**

One of the best ways to reduce your risk and comply with the law is by reading and following all pesticide label directions. In addition to the signal word, all pesticides registered by the EPA contain precautionary statements that include route-of-entry statements. Since many pesticides are hazardous by more than one route of entry, reading the entire statement can help reduce your risk. For example, pesticides with a **WARNING** signal word might contain one or all of the following route-of-entry statements:

- Harmful or fatal if swallowed.
- Harmful or fatal if absorbed through the skin.
- Harmful or fatal if inhaled.
- Causes skin and eye irritation.

If a product has a “harmful or fatal if absorbed through the skin” statement, be sure to wear pesticide-resistant gloves and other protective clothing to minimize your risk of exposure when applying the pesticide.

On many pesticide labels, specific action statements follow the route-of-entry statements.

These might include such statements as:

- Avoid contact with skin or clothing.
- Avoid breathing dust or vapors.
- Do not get into eyes.

Following these action statements will also help minimize your risk of pesticide exposure.

Many pesticide labels also contain protective clothing and equipment statements. These statements advise you about what you must wear while mixing, loading and applying the product, as well as after applying the pesticide. For those products without protective clothing requirements, re-read the pesticide label, especially the signal word and the route-of-entry statements, and make an informed decision on the protective clothing to wear and the equipment to use.

Other precautionary statements help minimize the risks to animals and the environment. Examples of statements you might find on a pesticide label:

- Do not contaminate food or feed.
- Wash thoroughly after handling and before eating or smoking.
- Not for use or storage in or around a house.
- Do not allow children or domestic animals into the treated area.
- This product is highly toxic to bees.

Remember, it is your responsibility **BY LAW** to read, understand and follow pesticide label directions. Doing so will also minimize the risk of exposure to you and others during and after a pesticide application.

### **References**

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