

PROPERLY ASSESS RISK OF PESTICIDE

Fluid ounces of prevention can prevent a lot of cure

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People are often hesitant to use pesticides for their own safety and potential effects on children, pets, and environment. Others may use four or five different pesticides to get rid of a pest, with no apparent concern.

Both examples warrant a closer look at what pesticides are, how to assess their toxicity, and how they can be used safely.

What is a pesticide?

A pesticide is any material (natural, organic, or synthetic) used to control, prevent, kill, suppress, or repel pests. "Pesticide" is a broad term. Some of the most common pesticides used around homes or landscapes include herbicides to kill weeds, insecticides to kill insects, rodenticides to kill rodents and fungicides to control fungus.

Assessing Pesticide Toxicity

We must understand how toxicity is classified to understand pesticide toxicity. The Environmental Protection Agency tests all pesticides before approved for use and assigns them a toxicity level. This toxicity level is indicated by the signal word displayed prominently on the pesticide label. The signal words are, from least to most toxic: Caution, Warning, Danger, and Danger Poison. See Table 1 next page.

Toxicity level is determined by the chemical's LD_{50} , the "lethal dose" measured in milligrams of product per kilogram of body weight, required to kill 50 percent of a test population, usually mice or rats. The oral (ingestion) LD_{50} is the most common

number used in comparisons, although depending on the product, it may also have a dermal (skin contact) and an inhalation LD_{50} . See Table 2 to compare the oral LD_{50} values of some pesticides to those of common household chemicals. Note that many of the common chemicals we use on a daily basis are more toxic than some pesticides. Compare table salt and Roundup, for example, while other pesticides, such as paraquat, are more toxic. (Many of the most toxic pesticides of the past, such as Temick 10G [with a LD_{50} of 6.2 mg/kg], have been removed from the market.) The most important thing to remember about the LD_{50} is that the lower the number, the more toxic a chemical.

To understand what this means to you, take a look at the toxicity equation:

$$\text{Risk} = \text{Toxicity} \times \text{Exposure}$$

This means your risk when using a pesticide is a function of the pesticide's toxicity and the amount of your exposure. To reduce risk, use pesticides only when necessary; if needed, choose the least-toxic option and reduce your exposure by taking proper safety precautions. LD_{50} values will never be found on a product label, but they can be found in the pesticides corresponding Safety Data Sheet (SDS) – all pesticide labels and SDS's can be readily found by searching the internet.



USE IN YARDS AND GARDEN



To explain LD₅₀ and mg/kg – this is milligrams (mg) of toxicant per kilogram (kg) of body weight. One kilogram is equal to 2.2 pounds. A 200-pound human is equivalent in weight to 91 kilograms. For any of the products listed above, multiply its LD₅₀ value (let's use paraquat at 35 mg) by 91 to understand the amount (3,185 mg) that must be ingested for a 200-pound individual to have a 50-percent chance of surviving (lethal dose to kill 50 percent of the test population). For paraquat, 3,185 mg is equivalent, in weight, to approximately consuming 10 (300 mg) aspirin.



Reducing Your Exposure

A study by the Minnesota School of Public Health demonstrated the importance of following proper safety measures and how this can reduce risk. They looked at farm family exposure to pesticides and found those farmers who did not follow proper safety measures not only put themselves at risk, but also their children and spouse.

The steps that most reduced exposure included wearing proper personal protective equipment (PPE), not allowing children to handle pesticides or application equipment, using proper PPE when working on application equipment, removing contaminated clothing before entering the home, and washing contaminated clothing separately from other household clothing.

The same applies when using pesticides around the home or in the garden.

Table 1. Signal words and associated oral (ingestion) and dermal (skin contact) LD₅₀ values

Signal Word	Toxicity Category	LD ₅₀ mg/kg	
		Oral	Dermal
Danger or Danger Poison	High	0 – 50	0-200
Warning	Moderate	50 – 500	200-2000
Caution	Low	>500	>2000

Table 2. Toxicity of some pesticides compared to the toxicity of common household chemicals.

Example	Pesticide	Acute oral LD ₅₀ mg/kg for rats
Caffeine ^a		192
Nicotine ^b		50
Aspirin ^c		750
Table salt		3300
Malathion	Insecticide	1000
2, 4-D	Herbicide	699
Roundup	Herbicide	5400
paraquat	Herbicide	35 mg/kg for humans (not rats)

^a 192 mg/kg is approximately equal to ingesting a fatal dose of 100 cups of coffee

^b 50-60 mg/kg is approximately equal to ingesting a fatal dose of two cigarettes

^c 760 mg/kg is approximately equal to ingesting a fatal dose of 15 to 45 tablets



Read the label to understand how, where, and when to apply a pesticide. The label will list what PPE is required. At a minimum, you must wear a long-sleeved shirt, pants, shoes, socks, and chemical-resistant gloves. Do not apply pesticides in shorts and flip-flops. This includes those premixed pesticides with the attached sprayer. They are still pesticides. Rather, wear chemical resistant (water proof) boots that are dedicated for working outside. Remove your boots prior to entering your home and do not wear them into public spaces. All other types of shoes can absorb chemicals and should be considered contaminated if worn again.

Other practices to reduce exposure include:

- Avoid eating, chewing gum, drinking, and or smoking during an application.
- Control, contain, cleanup spills immediately. Don't just try to wash away the spill; follow label

directions and properly dispose of spilled chemical and contaminated material.

- Store all pesticides in a secure location out of reach of children, pets, and others who might not understand the pesticide label.
- Never transfer pesticides into a container that isn't the original, especially one used for food or drink. Deaths or serious injury occur when someone has unknowingly consumed a pesticide that has been transferred into a secondary container.
- Finally, dispose of pesticides and pesticide containers according to the label and local and state laws. Never pour them down the drain. Contact your local University of Wyoming Extension or Weed & Pest District office for information on proper disposal in your area. Keep the National Pesticide Information Center phone number

1-800-858-7378 (open 6:30 a.m. – 4:30 p.m. Pacific time) handy in case of an accident with a pesticide.

UW Extension has developed the program "Know your pesticides: Protect yourselves, your family, and the environment" to help provide additional resources to help consumers make informed decisions about their pesticide purchases and use.

As part of this effort, we will be training retail employees to better help consumers make informed purchase decisions. In-store displays will also be in place at these retail locations with videos and other resources to help inform consumers.

For more information, please visit <http://bit.ly/knowyourpesticide>.

When considering the use of pesticides, take the time to read the label and become familiar with the chemical. Practice proper safety procedures to not only protect yourself, but also your family and the environment.

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