

Interpreting Pesticide Label Wording¹

Frederick M. Fishel²

Introduction

Pest problems occur in diverse settings from agricultural to commercial and residential. In Florida, pest control is a year-round consideration and many times a pesticide will be chosen as part of the management plan for the problem. If a pesticide will be part of the management plan, understanding the contents of the pesticide label is essential for the product's safe and effective use.

The pesticide label is a very expensive document. The information on the pesticide label represents the research, development and registration procedures that a pesticide must undergo before reaching the consumer at the market, frequently at a cost of millions of dollars to the manufacturer. The U.S. Environmental Protection Agency (EPA) requires a manufacturer to submit data from nearly 150 tests prior to that product's approval for use, including toxicity, environmental persistence and many other factors that may affect how the pesticide will be safely and effectively used. The pesticide use information obtained in this process is referred to as the label or labeling, two similar words but with different meanings.

The *label* is the information printed on or attached to the pesticide container; it has several interpretations. To the manufacturer, the label is the product's clearance to sell to applicators of pesticides. To governmental agencies, including the EPA, the label is a way to control the distribution, storage, sale, use and disposal of the product. To the buyer or user, the label should be considered as the main source of information on how to use the product correctly, legally and safely.

Labeling refers to all the information that you might receive from the company, their sales representatives or a local pesticide dealer about the product. This information may include brochures, flyers and other information accompanying the product.

Properly interpreting the pesticide label is crucial to selecting the most appropriate pesticide products for use and therefore receiving maximum benefit from their use. The length of a pesticide label varies widely, ranging from one to many pages of very fine print. While the label may seem overwhelming at first, it does not require a great amount of time to understand the information once the general format is

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2. Frederick M. Fishel, Associate Professor, Agronomy Department, and Director, Pesticide Information Office; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

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recognized. Label content for a single product changes frequently; applicators of pesticides should review labels of products they will be using on a regular basis.

You should read the pesticide label:

- Before purchasing the pesticide to ensure that it is the correct one for the job.
- Before mixing the pesticide to ensure the proper pesticide concentration.
- Before applying the pesticide to ensure proper use.
- Before storing of excess chemical or disposal of the empty container.

Information contained on most labels can be divided into four major categories: safety, environmental, product and use. This guide discusses the contents of these categories and provides interpretations.

Circled numbers in the sample label refer to numbered paragraphs that provide a description of the label interpretation in this publication.

Safety Information

1. Child hazard warning

The front panel of every pesticide label must bear the statement, "KEEP OUT OF REACH OF CHILDREN." Poisoning is a major cause of injuries to children. According to the American Association of Poison Control Centers, pesticide exposure incidents occur in greater frequency to children under the age of six years than to older children, teens and adults on an annual basis.

2. Signal word

A signal word (Table 1) is displayed in large letters on the front of the label to indicate approximately how acutely toxic the pesticide is to humans by ingestion. The signal word is based on the entire contents of the product, not the active ingredient alone, but takes into account the inert ingredients. The signal word does not indicate the risk of delayed or allergic effects. All highly toxic

pesticides that are very likely to cause acute illness through oral, dermal, or inhalation exposure have DANGER as their signal word and will carry the word POISON printed in red with the skull-and-crossbones symbol. Products that have the DANGER signal word due to skin and eye irritation potential will not carry the word POISON or the skull-and-crossbones symbol.

Table 1. Acute toxicity label signal words¹.

Signal word	Category	Oral lethal dose
DANGER, POISON (skull and crossbones)	I Highly toxic	A few drops to a teaspoonful
WARNING	II Moderately toxic	Over a teaspoonful to one ounce
CAUTION	III Slightly toxic	Over one ounce to one pint
CAUTION	IV Relatively non-toxic	Over one pint to one pound

¹ Based on a 150-pound person.

3. Statement of practical treatment

The labels for all highly toxic pesticides (signal word DANGER, Category I) must provide information to medical professional should an exposure occur. Examples of wording found in this section:

"If swallowed: Immediately induce vomiting by touching back of throat with finger. Drink 1 or 2 glasses of water and induce further vomiting. Call a physician or poison control center immediately."

"If in eyes: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention."

"If on skin, wash skin with soap and water. Get medical attention."

It is in this section that proper antidotes and treatment are recommended for medical personnel treating a victim. For this reason, the pesticide label should always be taken to the emergency medical facility when an exposure occurs. Products labeled DANGER also bear an 800 telephone number that

<p>7 RESTRICTED USE PESTICIDE (GROUND AND SURFACE WATER CONCERNS) For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.</p>	
<p>8 Super Fly Away Insecticide 14 3.5 EC</p>	<p>1 KEEP OUT OF REACH OF CHILDREN 2 CAUTION 4 Hazards to Humans and Domestic Animals Harmful if absorbed through the skin. Causes minor skin irritation.</p>
<p>9 Active Ingredient: Killzdamine: (2,4 butyl-p-toluidine).....24.5% Inert Ingredients.....75.5% 1 gal. contains 3.5 lb. killzdamine.</p> <p>10 NET CONTENTS: 2.5 GALS. (9.46 L) 11 EPA REG. #901-358 12 EPA Est. #901-FL-3</p> <p>3 Statement of Practical Treatment If swallowed, do not induce vomiting. Call a physician or Poison Control Center immediately. If in eyes, flush with plenty of water. If on skin, wash with plenty of soap and water. NOTE TO PHYSICIAN: vomiting should only be induced under professional supervision.</p>	<p>5 Personal Protective Equipment (PPE): Applicators and other handlers must wear: • Long-sleeved shirt and long pants • Chemical-resistant gloves • Shoes plus socks</p> <p>6 Environmental hazards This product is toxic to fish. Do not apply directly to water or to areas where surface water is present.</p> <p>15 Physical or Chemical Hazards Do not use or store near heat or open flame.</p> <p>18 Storage and Disposal Storage: do not contaminate water, food or feed by storage or disposal. Store at temperatures above 32 degrees F. Pesticide Disposal: wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Container Disposal: triple rinse (or equivalent). Then offer container for recycling or puncture and dispose in a sanitary landfill or by incineration.</p>
<p>17 Directions for Use It is a violation of federal law to use this product in a manner inconsistent with its labeling.</p> <p>AGRICULTURAL USE REQUIREMENTS Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Do not enter or allow worker entry into treated areas during the restricted entry interval of 4 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil or water is: • coveralls • waterproof gloves • shoes plus socks</p> <p>Warm-season turf: chinch bugs and mole crickets: apply 2 ounces product per 1,000 square feet and water in. Allow at least 10 days before making a second application.</p>	<p>16 Warranty Bugsby Inc. warrants that this insecticide conforms to the chemical description on its label. When used in accordance with label directions under normal conditions, this insecticide is reasonably fit for its intended purposes. The user assumes all risks of any such use, including the use of this product on turf species not recommended on this label.</p>
	<p>13 Bugsby, Inc. 2738 Washington Hwy. P.O. Box 4603 Pensacola, FL 64208-603</p>

Figure 1. Sample pesticide label.

physicians may call for further treatment advice at any time. Often labels for less toxic pesticides will also provide first-aid instructions.

4. Hazards to humans and domestic animals

This part of the label includes precautionary statements indicating specific hazards, routes of exposure and precautions to be taken to avoid human and animal injury. The label will contain statements that indicate which route of entry (mouth, skin, eyes, lungs) that must particularly be protected and what specific action is needed to take to avoid acute effects from exposure to the pesticide. Examples of such statements seen in this section include:

"Causes eye and skin irritation. Harmful if swallowed, inhaled or absorbed through skin."

"Do not get on skin or on clothing."

"Avoid breathing vapor or spray mist."

"Avoid contact with eyes."

"Prolonged or repeated skin contact may cause allergic reactions in some individuals."

"Wash thoroughly with soap and water after handling."

Pesticides that the EPA considers to have the potential to cause delayed effects must have label statements warning the user of that fact. These statements will indicate whether the product has been shown to cause problems such as tumors or reproductive problems in laboratory animals. Additional information in this section will alert users if the product has the potential to cause allergic effects, such as skin irritation or asthma. Sometimes the labeling refers to allergic effects as "sensitization."

5. Personal protective equipment

Most pesticide labels contain specific instructions concerning the type of clothing that must be worn during the handling and mixing processes. This information is usually found following the statements regarding acute, delayed and allergic effects. Some labels may list this information after the

signal word. Examples of some common statements from pesticide labels regarding personal protective equipment include:

"Chemical-resistant footwear plus socks;"

"long-sleeved shirt and long pants;"

"waterproof gloves;"

"protective eyewear" and many other similar statements.

The personal protective equipment listed is the minimum protection that should be worn while handling the pesticide. Sometimes the statements will require different personal protective equipment for different pesticide handling activities, usually with greater safety equipment emphasis on operations that involve handling concentrated products. In some cases, reduced personal protective equipment is allowed when you will be applying the pesticide in safer situations, such as enclosed cabs. Detailed explanations of interpreting personal protective equipment are provided in EDIS document PI-16, Interpreting PPE Statements on Pesticide Labels.

Environmental Information

6. Environmental hazards

This section of the label explains the nature of potential hazards and the precautions needed to prevent injury or damage to non-target organisms or to the environment. Some general statements appear on practically every pesticide label; for example, most pesticide labels will warn the user not to contaminate water sources when applying the pesticide, cleaning application equipment or disposing of pesticide wastes. It is also in this section that information can be found if the product poses a threat to groundwater. Instructions will be provided to minimize such impacts. Some labels will mention endangered species concerns in this section. Warnings of potential toxicity to honeybees may also be stated in this section. Examples of environmental hazard statements include:

"This product is highly toxic to honeybees;"

“This product is extremely toxic to fish and aquatic invertebrates;” and

“Do not apply where runoff is likely to occur.”

Product Information

7. Use classification

EPA is required to classify pesticides for either general use or restricted use. In classifying a pesticide, EPA considers:

- The toxicity of the pesticide;
- The way in which the pesticide will be used;
- The effect of the pesticide on the environment.

When a pesticide is classified as restricted, the label will state "Restricted Use Pesticide" at the top of the front panel. Below this heading may be a reason for the restriction. Although there is a federal list of restricted active ingredients determined by EPA, some states have their own lists of restricted products. Florida follows the federal guidelines for determining if a product is restricted. A current listing of federally restricted pesticides may be found at <http://www.epa.gov/opprd001/rup/rupjun03.htm>, which is updated periodically. To purchase and apply restricted use pesticides, a person must be certified and licensed in the state of Florida.

A general use pesticide is defined as one that will not harm the applicator or the environment to an unreasonable degree when used according to label directions. General use pesticides are available to the general public for use according to label directions. Applicators in Florida who operate in areas regulated under the Bureau of Entomology and Pest Control Chapters 388 and 482, F.S. (mosquito and pest control operators) are required to be certified and licensed regardless of pesticide classification. In other cases, such as persons applying herbicides for aquatic plant management, they may be required by their employer to be certified and licensed to apply any pesticide.

8. Brand (trade) name

Each manufacturer has a brand name for each of its products. Different manufacturers may use different brand names for the same pesticide active ingredient. For example, Pendulum®, Pre-M® and Prowl® are trade names for the same herbicidal active ingredient, pendimethalin. It is not legal to use different brand-name pesticides interchangeably even if they contain the same active ingredient. Each product label will state specifically the sites to which it may be applied. The brand name shows plainly on the front panel of the label.

9. Ingredient statement

This statement, normally on the front panel of the label, identifies the name and percentage by weight of each active ingredient. Identified by chemical or common name, the active ingredients are the components of the product that affect the target pest. The chemical name is often complex. For example, the chemical name for atrazine is 2-chloro-4-ethylamino-6-isopropylamino-s-triazine. To aid communication, EPA-approved common names may be substituted for chemical names. In this example, atrazine may be substituted for the chemical name. Usually following the list of ingredients, the amount of active ingredient is expressed as percent by weight for both liquid and dry formations of pesticides. For liquid pesticides, the number of pounds per gallon of active ingredient will be given in this section as well. For example:

Active Ingredient:

*Glyphosate, N-(phosphonomethyl) glycine, in the form of its isopropylamine salt
 53.8%

Other Ingredients 46.2%

*Contains 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 4 pounds per U.S. gallon of the acid, glyphosate.

Inert ingredients allow active ingredients to be formulated into many different products. As part of the formulation, they determine a product's handling properties. Inert ingredients that are not considered to

be toxic need not be named, but the label must show what percent of the total contents they make up. These ingredients make the product safer, more effective and easier to handle.

10. Net contents

The front panel of the pesticide label states how much is in the container. This can be expressed as pounds or ounces for dry formulations and as gallons, quarts, pints or fluid ounces for liquids.

11. EPA registration number

This number identifies a specific product and signifies that the product has met federal registration requirements through all of the testing phases. This number must have a minimum of two sets of digits. The "901" indicates the manufacturer and the "58" is the specific number issued to identify the product by the EPA. Sometimes there will be a third set of numbers present. This set identifies the distributor. Some states will require that some registration numbers carry a set of letters in this code as well.

12. EPA establishment number

This number identifies the facility that formulated the product. In the event of questions or concerns regarding a product, the facility that made the pesticide can be determined. Although not common, quality control problems have been tracked to the facility that formulated the product when problems with a specific product were identified.

13. Name and address of manufacturer

The law requires the maker or distributor of a product to put the company name and address on the label. This enables consumers to know who made or sold the product. In many cases, the manufacturer will also list a telephone number and/or web address where users of the product may seek technical advice.

14. Formulation

The front panel of some pesticide labels will describe the product formulation. The formulation name may be either spelled out or designated by an abbreviation, such as G for granular materials, WP for wettable powders, D for dusts or E or EC for

emulsifiable concentrate. There are other formulations, but these are some of the more common. This information is helpful for practical purposes because it provides insight about the type of application equipment that will be needed and the product's handling properties.

15. Physical or chemical hazards

This section will tell of special fire, explosion or chemical hazards the product may pose. For example, it will alert you if the product is so flammable that you need to be especially careful to keep it away from heat or open flame or if it is so corrosive that it must be stored in a corrosion-resistant container. This section is not always found in the same location within the labeling. Some labeling will identify physical and chemical hazards in a designated box while other labeling may list them on the front panel beneath the signal word. Others may list hazards under headings such as "Note" or "Important." Examples include wording such as:

“Do not use or store near heat or open flame.”

Some products will include statements concerning the diluted product such as:

“Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.”

Many other hazards may be found in this section.

16. Limited warranty and disclaimer

This statement conveys the manufacturer's assurance that the product conforms to the chemical description on the label and that it is fit for label purposes if used according to directions under normal conditions. The warranty does not extend to any use of the product contrary to label instructions, nor does it apply under abnormal conditions such as drought, tornadoes, hurricanes or excessive rainfall. Applicators who violate label instructions assume all liability associated with the product.

Use Information

17. Directions for use

This section usually makes up the bulk of a pesticide label and begins with the wording: "It is a violation of federal law to use this product in any manner inconsistent with its labeling." Products intended for use in agriculture will have an Agricultural Use Requirement box included in this section. It will contain the statement: "Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170." The purpose is to inform those handling the product that the Worker Protection Standard applies to the product. When the Worker Protection Standard applies, a statement regarding information on employee notification of restricted entry intervals and applications, proper training, decontamination, emergency assistance and personal protective equipment is stated here. Information on the Worker Protection Standard in Florida may be obtained at http://edis.ifas.ufl.edu/TOPIC_WPS.

The directions for use section will contain information such as:

- Sites, objects, animals, plants or areas where the product may be applied.
- The amount of product to use. This may be expressed as an amount per unit area, such as per acre or per 1,000 square feet. It may also be listed as an amount to mix per unit volume of water.
- A description of how the product should be applied and by which type of application equipment it is most effectively applied.
- The timing and frequency of application. For example, a label may state specifically time intervals between applications, such as "allow 10 or more days between applications."
- Limitations on reentry to treated areas will be given in specific terms. These reentry intervals may be very specific and given in terms of hours or days or they will simply state "do not enter or allow others to enter the treated area until sprays have dried."

- The pests that the product controls. The user assumes all risks for applying the product for control of a pest that is not listed on any given products label.
- Any number of various limitations associated with the product, including application intervals, crop rotation restrictions, animal restrictions and warnings about the use on certain sites.

18. Storage and disposal

Most, if not all, pesticide labels will contain a general statement in this section to the effect "do not contaminate water, food, or feed by storage, disposal, or cleaning of equipment" and "store in original containers only." Label information about storage generally includes temperature requirements. In many cases, minimum and maximum storage temperatures will be provided in specific terms. Some pesticides become ineffective if not stored under suitable temperatures; other pesticide labels may indicate that if freezing occurs and crystals form, then the product may be reused if it is warmed up. Moisture is a critical concern with dry pesticides, including granular materials and wettable powders, which have a strong affinity for water. When this is the case, the label may have the statement, "store in a dry place."

Labels include information on disposal of pesticide containers as well as excess quantities of diluted pesticide mixtures. The label will inform users that leftover mixtures that can't be applied to a labeled site may be disposed of in an approved waste disposal facility that is in accordance with appropriate federal, state and local procedures. With disposal of liquid pesticide containers, the triple-rinse procedure will be stated in this section of the label and options such as recycling or disposal of punctured containers in a sanitary landfill will be given. Manufacturers of returnable and refillable containers will remind the user to return the containers promptly and intact to the point of purchase. The label will state that bags containing dry pesticide products should be emptied thoroughly into the application equipment and incinerated or discarded into a sanitary landfill. Although burning of pesticide containers is legal in Florida, some counties have enacted ordinances which prohibit such activities. Applicators should

consult their local authorities to determine their county's status.