

## Pesticide Labeling: Ingredient Statements<sup>1</sup>

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*This guide explains how pesticide ingredient statements are presented on the pesticide label for products' active and inert ingredients. Examples of various types of pesticides are provided.*

### Introduction

Through backyard neighborly conversation on a warm, spring Saturday morning, one home lawn and garden enthusiast learned that he was missing out on a cost savings by applying his current pesticide product. The enthusiasts neighbor was using a less expensive (by unit amount) product that contained the exact same active ingredient. The only difference, besides the price, was that it was a different brand and sold by a different manufacturer. Learning how to understand ingredient statements on pesticide labels can not only save money, but can also prevent costly mistakes from occurring.

### What is included in an ingredients statement

The statement will be clear and prominent, containing the name and percentage of each active ingredient, and the total percentage of all “inert” or

“other” ingredients (Figure 1). If arsenic is contained in the product, a statement of the percentages of total and water-soluble arsenic calculated as elemental arsenic must be shown. Total percentage of the entire contents must sum to 100.

<b>ACTIVE INGREDIENT:</b>	
Isopropylamine salt of Imazapyr(2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)*	28.7%
<b>INERT INGREDIENTS</b>	71.3%
<b>TOTAL</b>	100.0%
*Equivalent to 22.6% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon.	

**Figure 1.** The product's percentage of ingredients is clearly stated on the label.

*Inert ingredient.* Inert ingredients are any substances other than the active ingredient that are intentionally included in a pesticide product. Some examples of ingredients that may be inert ingredients include: solvents, stabilizers, spreaders, stickers, surfactants, and defoamers. “Inert” and “other” are often used interchangeably in the ingredients statement. More information on inert ingredients may be referred to in UF/IFAS EDIS Document PI-44, *What are Inert Ingredients?* <http://edis.ifas.ufl.edu/PI081>.

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**Contents.** The name and nominal concentration expressed as a percentage by weight of each pure active ingredient will be placed under the ACTIVE INGREDIENT(S) heading. Liquid pesticides will also have a statement below the percentage amounts that lists the total pounds of active ingredient contained per gallon of formulation. The total percentage by weight of all inert ingredients are placed under the heading, INERT or OTHER INGREDIENT(S).

#### *Expanded inert ingredient statements.*

Occasionally, some manufacturers will disclose on the label the inert/other ingredients in their pesticide product either by chemical name or functional category with a brief explanatory definition. For example, "Purified water, glycerin (to help keep from freezing), or surfactant (to keep the active ingredient dispersed in water).

### Where the ingredients statement is found

In most cases, the statement is found on or near the front panel of the label. Some pesticide packages are so small or irregular in shape that placing the statement on the front panel is not practical. If on the front panel, it is usually just below the product's trade name. Manufacturers who have products with outside containers or wrappers through which the ingredients can't be identified will also place the ingredients statement on the outside container or wrapper.

### Active ingredient chemical and common names

With the majority of products, if there is an EPA-accepted common name of the active ingredient, then it will be listed followed by the chemical name (Figure 1). In some instances, chemical names of active ingredients may not be listed if the active ingredients common names are approved by the American National Standards Institute (ANSI, <http://www.ansi.org>). On products that display only common names, EPA recommends the inclusion of Chemical Abstracts Service (CAS, <http://www.cas.org>) numbers to identify ingredients

definitively. If the active ingredient is a microbial agent, it will be identified by genus and species (if appropriate, also by subspecies and/or isolate number--see Figure 2. For products that don't have accepted common or chemical names, descriptive names may appear, such as "tobacco dust," "egg solids," or "dried blood."

Active Ingredient:	
<i>Bacillus thuringiensis</i> subspecies <i>kurstaki</i> strain EG7841 solids, spores and Lepidopteran active toxins.....	40.00%
<b>Inert Ingredients:</b> .....	60.00%
<b>Total</b> .....	100.00%
The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.	

**Figure 2.** Ingredients statement for a product containing a microbial agent.

### Substatements (footnotes)

***Petroleum distillates.*** Products containing petroleum distillates, xylene or xylene range aromatic solvents of at least 10% will be shown immediately below the ingredient statement as a footnote (Figure 3).

#### *Other ingredients listed in substatements.*

Ingredients of toxicological concern and products containing more than 0.1% sodium nitrite will be indicated in a footnote. EPA considers the following inert ingredients as a toxicological concern: formaldehyde, isophorone, rhodamine B, phenol, diocetyl phthalate, 1,4-benzendiol, and nonylphenol. Although inert ingredients that are not of toxicological concern don't have to be listed, a manufacturer that chooses to list such an inert ingredient in the ingredient statement must list *all* inert ingredients.

ACTIVE INGREDIENTS:	
<b>Imazethapyr:</b> (+)-2-[4,5-dihydro-4-methyl-4-(1-methyl-ethyl)-5-oxo-1 H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid.....	2.24%
<b>Pendimethalin:</b> (N-1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine.....	30.24%
<b>INERT INGREDIENTS**:</b> .....	67.52%
<b>TOTAL</b> .....	100.00%
Pursuit® Plus EC herbicide contains 2.9 pounds of active ingredients per gallon (2.7 pounds of pendimethalin and 0.2 pounds acid equivalent of imazethapyr).	
**Contains petroleum distillates	

**Figure 3.** Ingredients statement of a product containing petroleum distillates.

### Active ingredients that degrade

In some cases, active ingredients degrade over time and render the product less effective or completely ineffective. An example is the many currently available products used for sanitizing that

contain sodium hypochlorite. Products containing 5.25 – 12.5% sodium hypochlorite as the active ingredient will have the following statements listed: “Degrades with age and exposure to sunlight and heat. Use a test kit and increase dosage as necessary to obtain the required level of available chlorine.”

### Specifically designated active ingredients

Some pesticide products, other than microbial agents, contain active ingredients that are specifically designated in their statements for proper clarification and identification. Some examples:

*Biochemical pesticides.* These include products that contain naturally-occurring plant regulators, such as cytokinins, auxins, or gibberellins. Their content would be stated in a recognized bioassay unit, such as “Cytokinin (equivalent to 200 ppm kinetin activity).”

*Pheromone products.* Pheromones are shown in mg per dispenser as a footnote.

*Insect virus-based insecticides.* Pesticide products containing an insect virus as the active ingredient indicate the number of activity units. This is given in terms of polyhedral inclusion bodies for nuclear polyhedrosis viruses or capsules for granulosis viruses per gram ( $10^6$  PIBS/gm) or percentages (%).

*Salts, amine, or ester of acids.* If the active ingredient is a salt, amine, or ester of an acid, the label will provide a substatement under the ingredient statement the percentage of the acid. This is common with herbicide products containing 2,4-D or paraquat/diquat (Figure 4).

<b>ACTIVE INGREDIENT</b>	
2,4-Dichlorophenoxyacetic acid.....	66.0%
2-Ethylhexyl ester*	
<b>INERT INGREDIENTS</b> .....	<b>34.0%</b>
	100.0%
This product contains 2,4-Dichlorophenoxyacetic Acid Equivalent* 43.9% - 3.8 lb./gal. *Isomer Specific by AOAC Method No. 978.05 (15th Ed.)	

Figure 4. Statement of the acid content.

*Copper and zinc salts or complexes.* Pesticide products for which the active ingredients are copper salts or complexes must declare the chemical name of the copper complex as active

ingredient and equivalent metallic copper declared in a substatement (Figure 5).

<b>ACTIVE INGREDIENTS:</b>	
COPPER AS ELEMENTAL.....	9.0%
<b>INERT INGREDIENTS:</b> .....	<b>91.0%</b>
<b>TOTAL</b> .....	<b>100.0%</b>
CUTRINE-PLUS contains 0.909 lbs. of elemental copper per gallon. *From mixed Copper-Ethanolamine complexes	

Figure 5. Statement of copper content.

*Brominated and/or chlorinated compounds.* Certain brominated or chlorinated compounds may require a reference in the ingredients statement to the available chlorine or bromine. This amount will be listed as “x% Available Bromine or x% Available Chlorine.”

*Metal ion exchange resins.* Any metal, such as silver or copper, used as a pesticide, when bound to an ion exchange resin, must be declared on the label as the percent metallic equivalent with a footnote specifying the identity and amount of the ion exchange resin which was used.

*Sodium chlorate products.* Because sodium chlorate is extremely flammable, all pesticide products containing sodium chlorate must contain a fire retardant in the formulation. Some manufacturers will state this in the vicinity of their trade names; others will state the presence of a fire retardant in the area of the ingredients statement (Figure 6).

<b>ACTIVE INGREDIENT:</b>	
Sodium Chlorate .....	20.00%
<b>INERT INGREDIENTS</b> .....	<b>80.00%</b>
<b>TOTAL</b> .....	<b>100.00%</b>
1 Gallon of Helena 2 lb. Sodium Chlorate Defoliant-Desiccant contains 2 pounds of Sodium Chlorate with a fire retardant.	

Figure 6. Statement of fire retardant.

*Arsenic containing products.* Pesticide products which contain arsenic in any form must include substatement of the percentages of total arsenic and water-soluble arsenic calculated as elemental arsenic (Figure 7).

*Fertilizer-pesticide combinations.* Pesticides that are formulated in combination with fertilizers must bear an ingredient statement the same as any other pesticides. The fertilizer composition is separate from the pesticide ingredient statement.

<b>ACTIVE INGREDIENT:</b>	
Monosodium Acid Methanearsonate	47.8%
<b>INERT INGREDIENTS:</b> 52.2%	
<b>TOTAL:</b> 100.0%	
Total arsenic, all in water soluble form, expressed as elemental 22.1%. This product contains 6 lbs. MSMA per gallon.	

**Figure 7.** Statement of arsenic content.

*Complexing agents.* In products containing an active ingredient bound with other agents as a complex, the active ingredient must be listed as a footnote with the complex formed (Figure 8).

Active Ingredients (by weight):	
Copper as elemental*	3.7%
Inert Ingredients (by weight):	96.3%
*Equivalent to 2.2 lbs. of elemental copper per 60 lbs.	
CUTRINE® PLUS GRANULAR from Mixed Copper Ethanolamine complexes.	

**Figure 8.** Statement of complexing agent.

### Additional information

Fishel, F.M. 2006. Defoliant and desiccants. UF/IFAS EDIS Extension Document PI-101. <http://edis.ifas.ufl.edu/PI138>

Fishel, F.M. 2005. Interpreting pesticide label wording. UF/IFAS EDIS Extension Document PI-34. <http://edis.ifas.ufl.edu/PI071>

Fishel, F.M. 2006. Plant growth regulators. UF/IFAS EDIS Extension Document PI-102. <http://edis.ifas.ufl.edu/PI139>

Fishel, F.M. 2005. What are inert ingredients? UF/IFAS EDIS Extension Document PI-44. <http://edis.ifas.ufl.edu/PI081>