Chapter 3
The Pesticide Label

This Chapter describes pesticide labeling, which includes the label itself plus all other information referenced on the label or received from the manufacturer when you buy the product. **By law, pesticide users are required to comply with all the instructions and use directions found on the pesticide labeling.** The pesticide product label is the main method of communication between a pesticide manufacturer and pesticide users. The labeling may include brochures, leaflets, and other information that accompanies the pesticide product. Pesticide labeling provides applicators with specific instructions on how to use products safely and correctly.

The labeling is the law, and pesticide applicators are provided with specific and detailed use information when purchasing the product.

Photo: National Pesticide Applicator Certification Core Manual, NASDARF
Section 1: The Importance of Pesticide Labeling

One of the more important tools to ensure the safe and effective use of pesticides is the product label. Pesticide manufacturers are required by law to put certain information on the label. Labels are legal documents providing directions on how to mix, apply, store, and dispose of pesticide products.

As part of the registration process, the U.S. Environmental Protection Agency (EPA) must approve all language that the manufacturer (registrant) proposes to include in the product labeling. The EPA reviews the labeling to make sure it contains all the information needed for safe and effective use of the pesticide product. Only after the EPA has reviewed the labeling and registered the product can a pesticide be sold for use in the United States. A pesticide must also be registered with the Minnesota Department of Agriculture (MDA) before it can be sold, distributed, or used in the state. This Section describes the reasons that pesticide labeling is so important to the applicator.

Learning Objectives:

1. Explain the difference between the pesticide label and pesticide labeling.
2. List two reasons why the EPA registration number is placed on a product label.
3. List at least three reasons why reading a pesticide label is important to the pesticide applicator.

Terms to Know:

- Label
- Labeling
- Special Local Need (SLN) registration
- Section 18 Exemption
### Example of a pesticide label.

**STATEMENT OF PRACTICAL TREATMENT**

Contact a doctor (physician, clinic, or hospital immediately) in case of suspected poisoning. Explaining that the victim has been exposed to galactothion and describe his/her condition. After first aid is given take victim to clinic or hospital. If breathing has stopped, start artificial respiration immediately and maintain until doctor sees victim.

If swallowed: If patient is conscious and alert, give 2 or 3 glasses of water or milk to drink, and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person. Get medical attention.

If on skin: Immediately flush the skin with plenty of water while removing contaminated clothing and shoes. See doctor immediately. Galactothion is an organophosphate pesticide that inhibits Cholinesterase.

If inhaled: Remove to fresh air. If not breathing give artificial respiration. Get medical attention.

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

**Note to Physician** Anidine—administer atropine di-sulfate in large doses. TWO to four mg. intravenously or intramuscularly as soon as cyanosis is overcome. Repeat at 5 to 10 minute intervals until signs of atropinization appear. 2-PAM chloride is also antidotal and maybe administered in conjunction with atropine. **DO NOT GIVE MORPHINE OR TRANQUILIZERS.** Galactothion is a strong cholinesterase inhibitor affecting the central and peripheral nervous system and producing cardiac and respiratory depression. At first sign of pulmonary edema, the patient should be given supplemental oxygen and treated symptomatically. Continued absorption of the poison may occur and fatigues and relaxes have been reported after initial improvement. VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS.

**PRECAUTIONARY STATEMENTS**

HAZARDS TO HUMANS (& DOMESTIC ANIMALS)

DANGER: Fatal if absorbed through skin, fatal if swallowed or inhaled. Do not breathe vapors or spray mist. Do not get on skin or clothing. Maybe irritating to eyes and may cause mild skin sensitization. Keep away from domestic animals. Discontinue use if allergic reaction occurs.

Signs and symptoms of overexposure

Salivation, muscle tremors, nausea, watery eyes, difficulty breathing, vomiting, pinpoint eye pupils, excessive sweating, diahrhea, abdominal cramps, weakness, headache.

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Some materials that are chemical resistant to this product are listed below. If you want more options, follow the instructions for category G on an EPA chemical resistance category selection chart.

Applicators and Other Handlers must wear:

- Coversalls over long-sleeve shirt and long pants
- Chemical-resistant gloves such as barrier laminate or vitron
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposures
- Chemical-resistant apron when cleaning equipment, mixing, or loading
- Respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approval number TC-14G)
- Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Concentrates do not use them. Follow manufacturer’s instructions for cleaning and maintenance PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**STORAGE AND DISPOSAL**

**PROHIBITIONS:** Do not contaminate water, food or feed by storage or disposal. Do not store under conditions which might adversely affect the container or its ability to function properly.

**STORAGE:** Do not store below temperature of 0°F.

**CONTAINER DISPOSAL:** Never reuse empty containers. Triple rinse (or equivalent). Then offer for triple rinse (or equivalent). Then offer for return or transfer to shippers for proper disposal. If inhaled: Remove to fresh air. If not breathing give artificial respiration. Get medical attention.

**RESTRICTED USE PESTICIDE**

Due to very high toxicity to humans and birds. For retail sale and to use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator’s certificate.

**ACTIVE INGREDIENT:**

| Galactothion (O,O-diethyl methyl phosphorothiate) | 20.9% |
| related isomers | 1.1% |
| **INERT INGREDIENTS:** | 78.00% |
| **Total** | 100.00% |

**Net Contents:** 5 Gallons

EPA Reg No. 12345-10

**VIP Chemical Company**

2527 VIP Drive

Biarspond, MI 22315

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS), for agricultural pesticides, the requirements may be reduced or modified as specified in the WPS.

**User Safety Recommendations**

Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product. Wash the outside of the gloves before removal.

**ENVIRONMENTAL HAZARDS**

This pesticide is highly toxic to aquatic invertebrates and wildlife. Birds in treated areas may be killed. Shrimp and other aquatic organisms may be killed at recommended application rates. Do not contaminate water by cleaning of equipment or disposal of wastes.

**PHYSICAL AND CHEMICAL HAZARDS**

Do not use or store near heat or open flame. Not for use or storage in or around the home.

**AGRICULTURAL USE REQUIREMENTS**

- **Agricultural Use Requirements**
  - This pesticide is highly toxic to aquatic invertebrates and wildlife. Birds in treated areas may be killed. Shrimp and other aquatic organisms may be killed at recommended application rates. Do not contaminate water by cleaning of equipment or disposal of wastes.

**DIRECTIONS FOR USE**

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply the product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**GENERAL DIRECTIONS**

Spray Preparation: To assure a uniform product, agitate or shake all containers of the product prior to use. Use 50 mesh screens or equivalent slotted strainers in spray system. To prepare for spraying, fill tank to the needed volume of water. Add the required amount of this insecticide and mix thoroughly by mechanical or hydraulic agitation. Finish filling tank with water to desired volume and thoroughly mix. Do not store spray to be used, VIP Pest-No must be fully dispersed in water first followed by addition of the intended tank-mix material. DO NOT USE MIXTURES THAT CURDLE, PRECIPITATE OR BECOME GREASY.

Note: Do not add VIP No Pest to water with pH values below 3.0 or above 8.5.

**DIRECTIONS FOR AERIAL OR GROUND SPRAY APPLICATION**

Application timing: Begin application when insect populations reach economic levels. Consult the Extension Service, professional consultants or other qualified authorities to determine appropriate threshold levels for treatment in your area.

Application instructions: Apply a minimum finished spray volume of 2 gallons per acre by air or 5 gallons per acre by ground unless otherwise directed under crop specific directions. For best results, it is important to obtain thorough and uniform spray coverage of the plant. Use lower dosage rates for heavy infestations, large larvae or dense foliage. The specific length of control depends on environmental factors, plant growth, dosage rates, and degree of insect infestation.

**Agricultural Use Requirements**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), notification-to-workers, and restricted entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 48 hours. The REI is 72 hours in outdoor areas where the average annual rainfall is less than 25 inches a year.

**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:**

- coversalls over long-sleeved shirt & long pants
- chemical-resistant footwear plus socks
- protective eyewear
- chemical-resistant headgear

Notify workers of the application by warning them orally and by posting warning signs at entrances to treated area.

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**ADAPTED FROM MSU PESTICIDE APPLICATOR CORE TRAINING MANUAL**
Basis of Pesticide Labeling

In this manual you will often be advised to “read the label” and “follow the directions on the label.” That’s because so much important information on how to use a pesticide is found on the label. This information is the result of years of research and testing for each pesticide that is put on the market. A manufacturer may make and screen thousands of compounds before finding one that can pass all the tests needed for a label to receive clearance from the EPA. These tests include the following:

- **Toxicological tests** to determine possible health hazards to humans and animals.
- **Metabolism studies** to see how long it takes a compound to break down into simple, less toxic materials.
- **Residue tests** to find out how much of the pesticide or its breakdown products remain on farm products, such as crops, meat, milk, and eggs.
- **Soil movement tests** to determine how long a pesticide stays in the soil, and how it moves in the soil and groundwater.
- **Wildlife tests** to determine the immediate and long-range effects on wildlife.
- **Performance tests** to prove that the pesticide controls the pest and improves the quality and quantity of the crop.

The EPA reviews these test results and determines whether to approve the pesticide. Once it is approved, the pesticide is registered. Information on the label and labeling must not differ from the information given to the EPA when the product was registered.

The **label** is the information printed on or attached to the pesticide container or wrapper; **labeling** refers to the label plus all additional product information, such as brochures and flyers, provided by the manufacturer or dealer. Both the label and labeling are legally binding documents and must be followed. State labels—that is, special local needs and emergency exemption labels—should be in your hands at the time of application.

### Types of Pesticide Registration

You are responsible for applying only pesticides registered with both the EPA and the MDA. A **registered pesticide** is one that has been researched and approved by the EPA for uses that are specified on the label and labeling. Look for the EPA registration number that must appear on all pesticide labels that confirms EPA registration.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) allows for three variations from the standard pesticide registration process, each of which is named for the part FIFRA where they are described.
24(c) Special Local Need Registrations

Special Local Need (SLN) registrations, also called 24(c) registrations, allow states to apply to EPA to expand or limit labeled uses of already registered pesticides to accommodate area-specific conditions. In some cases, SLN registration may allow pesticide use on minor crops not specified on the label, and in other cases SLN registration will add more restrictive use limitations than those found on the label. You must have the SLN additional labeling in your possession to use the pesticide for any purpose not listed on the label. These registrations are legal only in the region, state, or local area specified in the SLN labeling.

Section 18 Emergency Exemptions

Emergency exemptions address pest problems for which no pesticides are registered. The EPA can issue an emergency exemption at the request of the state regulatory agency. Usually these needs are based on specific public health emergencies or other crises that require the use of an unregistered pesticide. There must be no feasible alternative to the exemption. Known as a Section 18 exemption, it allows the sale and use of a certain pesticide product for a specific non-registered purpose during a specified period of time. For example, in 2004 some products received Minnesota Section 18 Emergency Exemption for use on soybeans to combat soybean rust. Applicators must have a copy in their possession and follow the instructions in the Section 18 approval letter from EPA to the state to legally use the product.

Section 25(b) Minimum-risk Pesticides

EPA has reviewed and identified a number of substances that are generally considered minimum risk when used as a pesticide and are exempt from EPA pesticide registration under Section 25(b) of FIFRA. These products are not required to go through the formal EPA label review and registration approval process and have no EPA registration number. Minnesota, like a number of states, also does not require 25(b) products to be registered with the MDA. For more information on these products see Chapter 2, Pesticide Laws.

When to Read the Pesticide Label

It is important for applicators to read and understand the pesticide label. Important times to read the label include:

- **Before buying the pesticide.** Make sure the pesticide is registered for your intended use. Understand any site restrictions. Be certain its use is suitable for weather conditions at the time of application. Find out what personal protective equipment and special application equipment will be needed.

- **Before mixing and applying the pesticide.** Learn how to mix and apply the material safely. Find out what precautions to take to prevent exposure to people and non-target organisms. Learn what first aid and medical treatments are necessary should an accident occur.

- **When storing pesticides.** Find out how to store the pesticide properly. Understand the special precautions to prevent fire hazards or spills.
Section 2: Parts of the Label

It is the user’s responsibility to read and understand the label before buying, using, storing, or disposing of a pesticide. This Section will describe the various label components and what important information these label parts provide for pesticide applicators. Parts of the example label on page 64 will be used to illustrate label parts.

Learning Objectives:

1. Compare and contrast pesticide trade, common, and chemical names.
2. List and define pesticide label “signal words.”
3. Describe where you should look on a pesticide label to find out what to do if a pesticide gets on the skin, in the eyes, is swallowed, or inhaled.

Terms to Know:

- Common name
- Trade name
- Chemical name
- Inert ingredients
- “Agricultural Use Requirements” box

Trade, Brand, or Product Name

The brand or trade name shows up plainly on the front panel of the label and is the one used in advertisements and by company sales people. Manufacturers use different trade names, even though the products contain the same active ingredient. The brand name often indicates the type of formulation and the percentage of active ingredient present. For example, in the sample label on page 68, “VIP No Pest Gel” is a registered trade or brand name of the product. Gel in the brand name indicates the product’s formulation.
Ingredient Statement

Every pesticide label has an ingredient statement that provides the amount of active ingredients (those that the manufacturer claims have effects on the targeted pests) in the formulation, the official chemical name, and amount of other ingredients.

Other ingredients (often called inert ingredients) are substances added to the active ingredients to formulate the final usable product, but have no effect on targeted pests. Unlike active ingredients, these other ingredients are considered proprietary information. Inert ingredients that are not considered hazardous and are less than 1 percent of the product may not require listing on the MSDS label (see Section 3 in this Chapter for more information about the MSDS). The other ingredients may have effects on humans or other animals, plants, or the environment. However, the EPA maintains a list of other ingredients that are not considered to pose excess hazards to non-target organisms, and manufacturers choose from this list when they formulate products.

The chemical name is the scientific name that identifies the chemical components and structure of the pesticide’s active ingredient. Because chemical names of active ingredients are usually complex, many are given a shorter common name. Only those common names officially accepted by the EPA may be used in the ingredient statement on the pesticide label. Labels are not required to include the common name in the ingredients statement. By referring to the common or chemical names, rather than the brand name alone, you are certain of getting the right product for your needs. In the sample label on page 69, “galactothion” is the common name and “0,0-diethyl methyl phosphorothionate” is the chemical name of the active ingredient.
Use Classification Statement

The EPA classifies some pesticide products as restricted use (RUP). Every product that is federally classified as a restricted-use pesticide must include the following statement at the top of the front panel of the pesticide label:

RESTRICTED USE PESTICIDE

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 certificate.

Unclassified or general-use pesticides can be purchased and used by the general public or by farmers without certification. Farmers and other producers of agricultural commodities must be certified as private applicators to apply RUPs in Minnesota. Remember if you hire a service to apply pesticides on your farm, the applicator must hold a commercial pesticide applicator license to apply any pesticide, RUPs and non-RUPs.

Type of Pesticide

The type of pesticide is usually listed on the front panel of the pesticide label. This short statement indicates in general terms where the product can be used. Examples of description of pesticide types include the following:

**Insecticide for control of certain insects on fruits, nuts, and ornamentals.**

**Insecticide for broad-spectrum control of crawling, flying, and wood-infesting insect pests on indoor and outdoor surfaces, as well as pests of trees, landscape ornamentals, and residential and commercial lawns.**

**Herbicide for the control of woody brush and weeds.**
Net Contents

The pesticide label must show how much product is in the container. This is expressed as pounds or ounces for dry formulations or as gallons, quarts, or pints for liquids. Liquid formulations may also list the pounds of active ingredient per gallon of product.

Name and Address of Manufacturer

The law requires that the manufacturer or formulator of a product put the name and address of the company on the label.

Emergency Telephone Number

Many pesticide manufacturers include emergency telephone numbers on their product labels to provide customers technical information on how to respond in the event of an emergency (poisoning, spill, fire) involving their products.

Registration Numbers

An EPA registration number must appear on all pesticide labels, except those designated by EPA as 25(b) minimum-risk pesticides. The EPA registration number indicates that the pesticide product has been registered and its label approved by the EPA. For special local needs registration, the EPA registration number will start with SLN.

Establishment Number

Don’t confuse the EPA establishment number with the EPA registration number. An EPA establishment number identifies the facility where the pesticide was produced. This is required on the product label in case a problem arises or the product is found to be adulterated in any way.

Signal Words and Symbols

Most pesticide labels must include a signal word. This important designation gives the user an indication of the relative acute human toxicity and help you choose the least toxic chemical that provides the
needed level of pest control (for more about signal words, their meaning and toxicity, see chart on page 234, Appendix A, Pesticide Toxicities and Chapter 6, Health and Safety). The signal word must appear in large letters on the front panel of the pesticide label along with the statement “Keep out of Reach of Children.” Very low toxicity pesticides (Toxicity Category IV) are no longer required to display a signal word, although many manufacturers still include a “CAUTION” signal word on the label of these products.

Precautionary Statements

Pesticide labels contain statements on how applicators can protect themselves, their employees, and other persons or animals. Sometimes these statements are listed under the heading “Hazards to Humans and Domestic Animals” or may be included in other sections of the label. Personal protective equipment (PPE) listed in precautionary statements included on the label must be worn during use of the pesticide.

Hazard statements (hazards to humans and domestic animals, environmental hazards, and physical or chemical hazards) are not located in the same place on all pesticide labels. Some labels group them under the headings listed above. Other labels list them on the front panel beneath the signal word. Still other labels list the hazards in paragraph form somewhere else on the label under headings such as “Note” or “Important.” Before using a pesticide, read and understand the label to ensure that you handle the product properly and safely. The following types of precautionary statements found on the label give the pesticide applicator the best instructions on how to prevent problems.

Routes of Entry and Specific Action Statements

Routes of entry and specific action statements go hand-in-hand. Routes of entry indicate how the pesticide enters the human body (orally, inhaling, or absorbing through the skin and eyes). Specific action statements usually follow, either directing or recommending specific precautions. These statements are particularly important if the label does not list required personal protective equipment.

These statements are directly related to the pesticide’s acute toxicity and signal words. Many pesticide products are hazardous by more than one route of entry. Study these statements to understand how you may be exposed and what to do to prevent exposure. The table on page 73 shows examples of signal words and corresponding precautionary statements that you might see on a label.

Protective Clothing and Equipment Statements

Pesticide labels vary in the type of information they contain on protective clothing and equipment. Some pesticide labels fully describe appropriate protective clothing and equipment, while others carry no PPE information.
at all. Some labels list the kinds of respirators that must be worn when handling and applying the product; others require the use of a respirator, but do not specify a type or model.

More detailed information may be found on the pesticide’s Material Safety Data Sheets or MSDS (see Section 3 for more on MSDS). Follow all directives on protective clothing or equipment that appears on the label and in the MSDS. Labels list the minimum PPE required, but applicators can choose to use more. To determine the proper type of protective clothing and equipment, also consider the signal word, the route of entry statements, the specific action statements, and the MSDS.

Other Precautionary Statements
Labels often list other precautions that should always be followed when handling the product. These are self-explanatory and common sense statements. The absence of such statements from the label does not indicate that these precautions should be ignored.

- Do not contaminate food or feed.
- Remove and wash contaminated clothing before reuse.
- Wash thoroughly after handling and before eating or smoking.
- Do not allow children or domestic animals into the treated area.
<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Routes of Entry</th>
<th>Acute Exposure Statements</th>
<th>Action Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
<td>Oral</td>
<td>Fatal if swallowed.</td>
<td>Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>Poisonous if inhaled.</td>
<td>Do not breath (dust, vapor, or spray mist). Wear (specific respirator protection). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Skin</td>
<td>Ex. 1. Fatal if absorbed through skin. Ex. 2. Corrosive. Causes skin irritation.</td>
<td>Do not get on skin or clothing. Wear (specific PPE listed). Wash thoroughly with soap and water… (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Eye</td>
<td>Corrosive. Causes irreversible eye damage.</td>
<td>Do not get in eyes or on clothing. Wear (specific eye protection listed). Wash thoroughly with soap and water… (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td>Warning</td>
<td>Oral</td>
<td>May be fatal if swallowed.</td>
<td>Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>May be fatal if inhaled.</td>
<td>Do not breath (dust, vapor or spray mist). Wear (specific respirator protection). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Skin</td>
<td>Ex. 1. May be fatal if absorbed through skin. Ex. 2. Causes skin irritation.</td>
<td>Do not get on skin or clothing. Wear (specific PPE listed). Wash thoroughly with soap and water… (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Eye</td>
<td>Causes substantial but temporary eye irritation.</td>
<td>Do not get in eyes or on clothing. Wear (specific eye protection listed). Wash thoroughly with soap and water… (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td>Caution</td>
<td>Oral</td>
<td>Harmful if swallowed.</td>
<td>Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td>May be harmful if inhaled.</td>
<td>Avoid breathing (dust, vapors or spray mists). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Skin</td>
<td>Harmful if absorbed through skin.</td>
<td>Avoid contact with skin, eyes, or clothing. Wear (specific PPE listed, if appropriate). Wash thoroughly with soap and water … (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
<tr>
<td></td>
<td>Dermal Eye</td>
<td>Causes moderate eye irritation.</td>
<td>Avoid contact with eyes or clothing. Wear (specific eye protection, if appropriate). Wash thoroughly with soap and water… (see statement above). Remove and wash contaminated clothing before reuse.</td>
</tr>
</tbody>
</table>
First Aid

The first aid section on the label, sometimes called “Statement of Practical Treatment,” lists actions to be taken in case of poisoning or accidental exposure. All DANGER labels and some WARNING and CAUTION labels contain a note to physicians describing the appropriate medical procedures and antidotes for poisoning emergencies. The label should always be available in case of emergencies.

Statement of Practical Treatment

- **If in eyes:** Flush with plenty of water. Get medical attention if irritation persists.
- **If on skin:** Wash with plenty of soap and water. Get medical attention if irritation persists.
- **If swallowed:** Do not induce vomiting. Promptly drink a large quantity of milk, egg whites, or gelatin solution. If these are not available, drink large quantities of water. Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.
- **If inhaled:** Move victim to fresh air.

Environmental Hazards

Some products are classified as restricted-use because of the environmental hazards they may pose. Watch for special warning statements on the label concerning hazards to the environment. Different types of environmental hazard statements may be included on the label.

General Environmental Statements

General environmental label statements are reminders to follow certain common-sense procedures to avoid contaminating the environment. The absence of any or all of these statements does not mean that you do not need to take adequate precaution. Examples of general environmental statements include:

- Do not apply when runoff is likely to occur.
- Do not apply when weather conditions favor drift from treated areas.
- Do not contaminate water by improperly disposing of rinse water and other pesticide wastes.
- Do not apply when bees are likely to be in the area.
- Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high-water mark.
- The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.
Hazards to Wildlife Statements

If a pesticide is especially hazardous to wildlife, the label will say that. The label statement helps applicators choose the safest product for a particular job and reminds them to take extra precautions. For example:

- This product is highly toxic to bees.
- This product is extremely toxic to fish and aquatic invertebrates.
- This product is toxic to birds and other wildlife.

Physical or Chemical Hazards

This section of the label describes any special fire, explosion, or chemical hazards the product may pose. For example:

- Flammable—do not use, pour, spill, or store near heat or open flame. Do not cut or weld container.
- Corrosive—store only in a corrosion-resistant tank.

Agricultural Use Requirements

An “Agricultural Use Requirement” box is found only on labels of products that are covered by the EPA Worker Protection Standard (WPS – see Chapter 2, Pesticide Laws for more information). The box contains information about

Chapter 3. The Pesticide Label
WPS and lists product-specific requirements for WPS-covered workers and handlers. These listed requirements include WPS restricted-entry intervals (REI) and PPE for WPS-covered handlers and early-entry workers. The WPS REI specifies how much time must pass between the application of a pesticide and the reentry of unprotected workers into a treated area.

If there are multiple REIs on a label, you can usually find the appropriate REI at the beginning of the use-direction section for each crop. If no REI statement or other entry restrictions appears on the label, then all persons should wait at least until sprays have dried or dusts have settled before reentering a treated area without label-required PPE. An example of an Agricultural Use Requirements is shown below.

Example of Agricultural Use Requirements
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR, part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours. Exception: if the product is applied by drenching, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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.

Non-agricultural Use Requirements
The requirements in this Section apply to pesticide uses that are not within the scope of the WPS, such as the application of pesticides to lawns, golf courses, ornamental plantings, structures (except greenhouses), aquatic areas, and rights-of-way. Specific reentry times are not generally listed for these uses, though the label often cautions people and pets not to enter treated areas until spray has dried or dust has settled.
Example of Non-agricultural Use Requirements

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR, part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses. **Do not allow others to enter treated areas until sprays have dried.**

Storage and Disposal

All pesticide labels contain general instructions for the appropriate storage and disposal of the pesticide and its container. One or more statements may appear in a special section of the label titled “Storage and Disposal” or under headings such as “Important,” “Note,” or “General Instructions.” These may include:

- Store herbicides away from fertilizers, insecticides, fungicides, and seeds.
- Store at temperatures above 32°F (0°C).
- Do not reuse container; render unusable.
- Do not contaminate water, food, or feed by storage or disposal.
- Triple-rinse, or equivalent, and dispose of in an approved landfill.

More information about storage and disposal of pesticides in Minnesota can be found in Chapter 7, Safe Handling.

Directions for Use

These instructions provide the directions on how to use the product. The use instructions will tell you:

- The crop, animal, or site the product is intended to protect.
- The pests that the manufacturer claims the product will control.
- How much to use (rate) and how often.
- Where and when the material should be applied.
- The proper mixing instructions.
- How to minimize drift.
- Phytotoxicity (damage to plants) and other possible injury.
- How close to harvest the product can be applied.
- Re-cropping, composting, grazing, and other restrictions.
Label Summary

Many terms are used on labels to describe when and how to use pesticides. Your understanding of these terms will help you obtain optimum results from pesticide applications. Refer to the Appendix B, Glossary in this manual to look up a term. If you do not understand the directions on a label, check with your pesticide dealer or salesperson, the University of Minnesota Extension, or the Minnesota Department of Agriculture.

The label provides a wealth of information for pesticide applicators. Remember, the label is a legal document. It is illegal and considered a misuse to use any registered pesticide in a manner inconsistent with its labeling. Following label directions maximizes effective control of pests and minimizes hazards to people and the environment.

Section 3: Material Safety Data Sheets (MSDS)

Material Safety Data Sheets (MSDS) are very useful documents for learning about specific chemical and physical properties of pesticides or other potentially hazardous substances. Manufacturers of these substances are required to develop and to provide upon request an MSDS for each product. The information in the MSDS complements the pesticide label. This Section describes the information a pesticide applicator can obtain from the MSDS and where to find them.

Learning Objectives:
1. List three uses of MSDS.

Term to Know:
- MSDS (Material Safety Data Sheets)
- Soil KOC
While the pesticide label focuses on how to use the product safely, the MSDS provides technical information about the product’s hazards to workers and end users. The MSDS provides detailed information about the product’s composition, physical and chemical properties and hazards, toxicological and ecological information, and first aid procedures.

Emergency responders often require the product MSDS before responding to incidents involving pesticides and other chemicals. Businesses using pesticides and other products are required to keep appropriate MSDS and make them available to workers or others who may come into contact with the substance, its diluted end product, or its residues. Private applicators should obtain MSDS for the pesticides they use. MSDS are available from manufacturers and distributors of pesticides.

Pesticide applicators should review the toxicological, first aid, and PPE sections of the MSDS before handling a pesticide concentrate. Because MSDS are technical documents, parts of them can be difficult to understand. Ideally, the MSDS is used in combination with the pesticide label, but it should never be used in place of the actual product label.

Components of the MSDS
The information contained in the MSDS may appear under various headings and does not have to follow the same order, but the elements of all MSDS are the same.

Chemical Product Identification
As with the pesticide label, the MSDS identifies the ingredients in the product by common (generic) name, percentage of the active ingredient(s), and percentage of inert or other ingredients. This section of the MSDS may also provide information about the class of chemical, such as “organophosphate insecticide” or “chlorophenoxy herbicide.” Because chemicals in a particular class share certain characteristics, this information may be helpful, particularly to the health-care professional. This section also may provide brand names of other products with the same composition.

Example of Product and Company Identification
Product Name: VIP No Pest Gel
Product Code: 2777A1CC
Active Ingredient: Galactothion
Chemical Family: Chloronicotinyl
Molecular Formula: C12H20ClI2O3 (galactothion)
Chemical Name: VIP 11815; 0,0-diethyl methyl phosphorothiate
Manufacturer: VIP Chemical Co.
Emergency Telephone Number: (800) 111-2323
Physical and Chemical Properties

This Section describes the product’s physical appearance and provides information about how the product behaves under certain physical and chemical conditions. Particularly relevant are the measures for water solubility, vapor pressure, soil KOC, stability, and freezing/boiling point. These physical and chemical properties can impact mixing and storage, drift, leaching, and runoff. More information about water solubility and vapor pressure can be found in Chapter 5, Protecting the Environment.

The Soil Organic Carbon-Water Partitioning Coefficient (or soil KOC) is the ratio of the mass of a chemical that is adsorbed by soil per unit mass of organic carbon in the soil per the equilibrium chemical concentration in solution. Soil KOC values are useful in predicting the mobility of pesticides; higher KOC values correlate to less mobility, while lower KOC values correlate to more mobility. This parameter is used to calculate a soil concentration that protects groundwater.

From a human exposure standpoint, products with high water solubility are not stored in body fat but excreted in urine. Products with relatively high volatility are more likely to be detected through smell than products with low volatility. Some MSDS provide direct information about the odor of a product. Products may range from practically odorless to very strong in odor.

Stability and the freezing and boiling points of a substance determine whether a product can be stored over the summer or winter. Freezing and excessive heating may degrade the product, resulting in a loss of efficacy against the pest.

Physical and Chemical Properties

- **Boiling Point:** 212°F  
- **Melting Point:** NI  
- **Evaporation Rate (Butyl Acetone = 1):** NI  
- **Vapor Pressure (mm Hg):** <17 @ 78°F  
- **Vapor Density (Air = 1):** >1  
- **Specific Gravity (H2O = 1):** 1.14600  
- **Solubility in Water:** Infinite  
- **Appearance and Odor:** Brown liquid; amine odor.  
- **Other Information:**  
  - pH = 7.5–8.0  
  - Density = 9.63 pounds/gallon  
  - Freezing point <35°F  
  - Percent volatile by volume 46%

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Fire and Explosion Hazards

Some substances can spontaneously catch on fire at a certain temperature. In such cases, the MSDS identifies the temperature, called the flash point, at which the substance catches fire. The MSDS may list conditions to avoid, such as materials that are incompatible with the product. For instance, some substances can react with galvanized containers to form hydrogen gas, a highly combustible material.

Toxicological Information/Human Health Data

The MSDS identifies by what route(s) of exposure the product may be harmful (for example, ingestion, through the mouth; dermal, through the skin or eyes; and inhalation, by breathing in the product’s vapors). The MSDS also summarizes results of toxicological tests performed on laboratory animals and discusses the potential for effects on humans. Here is a list of toxicological and health data commonly found on MSDS:

- Acute toxicity,
- Chronic toxicity,
- Delayed toxicity,
- Oncogenicity (ability to cause tumors),
- Carcinogenicity (ability to cause malignant tumors, or cancer),
- Teratogenicity (ability to cause birth defects), and
- Fetotoxicity (other adverse effects on the fetus, such as low birth weight or spontaneous abortion).

The MSDS also lists symptoms of acute overexposure and usually lists medical conditions that may be aggravated by exposure to the product. It is important to remember that a substance’s level of acute toxicity is not related to its ability to cause chronic or delayed effects. The MSDS usually provides specific information about the product’s ability to cause eye and skin irritation or allergic responses.

Allergic responses are also not related to the chemical’s level of acute toxicity. Thus, it is possible for a slightly toxic pesticide (Category III) to be associated with adverse long-term effects or allergic reactions and, conversely, for a highly toxic pesticide (Category I) to have no known long-term or allergic effects. (See Chapter 6, Health and Safety, for a discussion of toxicity categories.)

Cholinesterase Inhibitors

If the pesticide can inhibit cholinesterase, an enzyme that regulates nerve impulses, the MSDS may identify the pesticide as a cholinesterase inhibitor. Cholinesterase inhibitors are a class of compound that includes chemical warfare nerve agents and certain insecticides. Cholinesterase inhibitors can have serious health effects, such as depression of respiratory drive, paralysis of muscles of respiration, and airway constriction.
Regulatory Exposure Limits
Some compounds have regulatory limits on the concentration and the amount of time a worker can be exposed to them. These limits are based on the concentrated product, rather than the diluted or mixed form, and are listed in the MSDS.

Personal Protection Recommendations
Many products do not require special protective equipment. Others require chemical-proof gloves, goggles, respirators, or other gear. Remember that the equipment listed on the MSDS pertains to the product as formulated. Refer to the pesticide label to check whether protective gear listed on the MSDS is required to be worn while handling the diluted product.

Additional Information
The MSDS must also provide:

- **Emergency and first aid procedures**—specific information about first aid and emergency treatment for persons exposed to the product. The MSDS provides treatment information for emergency responders and physicians.
- **Ecological or environmental hazards**—information on acute and chronic effects on wildlife in similar terms as the statements pertaining to humans.
- **Spills, fires, and accident procedures**—directions for cleaning up spills and leaks, as well as special information for firefighters.
- **Storage and disposal**—directions on how to store and properly dispose of the pesticide. This information may range from very specific to quite general.

Have an MSDS available for every pesticide product that you are using. Read both the pesticide label and the MSDS for a more complete picture of the potential hazards associated with the pesticide. Both the label and the MSDS provide valuable information in case of a pesticide emergency.

Summary
The language on pesticide labels is strictly regulated by the EPA, in coordination with pesticide manufacturers, to provide precise information on how to use pesticides correctly and safely. It is the applicator’s responsibility to read, understand, and follow the label directions to ensure that pesticides are applied according to regulations. The label directions are written to instruct the applicator how to use the pesticide for effective control of the target pest while minimizing harmful effects to other organisms and the environment. Make sure the pesticide has both federal and state registration for its intended use.
Pesticide labels in combination with MSDS provide a wealth of information on the hazards associated with each pesticide. Carefully review these documents before applying any pesticide. Applicators are better prepared to avoid any harmful effects if they understand the properties of the pesticide thoroughly. Remember, it is the applicator’s responsibility to ensure that pesticides are applied effectively and as safely as possible.