



PROTECTING YOURSELF, WORKERS AND FAMILY MEMBERS FROM POISONINGS

Pesticides are commonly used by farmers to control pests and increase crop yields. Over the years it was realized that pesticide use had environmental as well as health risks which have led to pesticide regulation. Still today, poisonings occur. According to the National Institute of Occupational Safety and Health over 10,000 people died from accidental poisoning. 25-35% are skin injuries that resulted in an average of 11 lost work days. Currently there are over 80,000 chemicals on the market. (1) It is critical that people who work with chemical hazards know their danger and take the necessary precautions to prevent poisoning.

Pesticide

- A. Often misunderstood to mean “only” insecticides (insect control)**
- B. Rodenticides (Ant and Roach Spray)**
- C. Fungicides (Controls molds)**
- D. Herbicide (Controls weeds on lawns)**

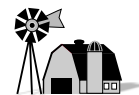
(Pesticides also include household toilet bowl cleaners and disinfectants)

Purchasing pesticides

- A. Read the entire label before you buy a product, before you open it, before mixing and prior to application! *(It's against the law to use pesticides differently than the label directs.)***
- B. Following directions exactly helps maximize benefits and minimize risk**
- C. Check to see that the pesticide has an Environmental Protection Agency (EPA) registration number**
- D. Obtain Material Safety Data Sheet**

Material Safety Data Sheets (MSDS)

- A. Sheets that can be obtained for any hazardous chemical *(Even grocery stores are obligated to have MSDS on hand for chemicals sold in the store.)***
- B. Contains important information regarding chemical**
 - Chemical identity
 - Hazardous ingredients
 - Physical and chemical characteristics
 - Fire, explosion reactivity data *(including physical hazards of chemical, its ability to burn and fire fighting recommendations)*



Health hazard information (*signs and symptoms of exposure*)
Precautions for safe handling and use
Spill control procedures
Control measures for use

C. MSDA Availability

Supplier
Manufacturer
Phone number listed on label
• On-line (*many free*)

Toxicity levels

- A. Measurement of the potential for a pesticide to cause harm
- B. Risk of using pesticides can be minor or lethal
- C. Chemicals pass more quickly through some areas of the skin than others
- D. Absorption rates compared to the forearm (1.0)

(2)

Body Part	Absorption Rate
Scalp	3.7
Forehead	4.2
Ear Canal	5.4
Abdomen	2.1
Forearm	1.0
Palm	1.3
Scrotal area	11.8
Ball of foot	1.6

E. Acute (short-term) Toxicity Classification determines the effects of exposure over a short period of time

Danger — Poison (in red): Toxicity Class I

- Highly toxic
- Can be lethal in very small doses if used incorrectly or inappropriately

Warning: Toxicity Class II

- Moderately toxic
- Can be lethal
- Follow directions carefully

Caution: Toxicity Class III and IV

- Slightly toxic or relatively nontoxic
- Follow safety precautions



F. Chronic (long-term) Toxicity

Danger of repeated exposure (*can result in*)

- Birth defects
- Nervous disorders
- Tumors (benign or malignant)

Cholinesterase inhibition

- Cholinesterase is an enzyme produced by the body that is needed for the central nervous system to function properly
- Absence of cholinesterase leads to confusion of the body's nervous system

Most common symptoms (*can occur within minutes to hours*)

- Headaches
- Dizziness
- Nausea
- Abdominal pain

Protective Equipment

A. Read label to determine appropriate equipment

B. Consider the nature of the work to be performed

C. Consider points of entry (*will help you determine protective wear*)

Skin (dermal)

Mouth (oral)

Eyes

- Gloves
- Splash-proof goggles or face shield

D. General protection

Long-sleeved shirt

Full-length pants

E. When working with moderate to severely toxic substances wear

Rubber gloves

Rubber boots

Chemical cartridge respirator

Mixing Pesticides

A. Follow directions carefully

Become familiar with types and formulations (*used on a regular basis*)

Use only recommended amount (*Don't assume more is better.*)

Use only on site listed on the label (*e.g. if it says for use on corn but says nothing about beans, it is illegal to use on beans.*)

Do not pour from a container that is too heavy

Use appropriate measuring tools



- B. Keep hands away from face, head and neck while mixing**
- C. Liquids should be opened on a flat surface and below eye level**
- D. Open powders with scissors**
- E. Do not use your hands to mix pesticides or to reach for something that has fallen into a pesticide tank**
- F. Mix in a well ventilated area**
 - Check weather conditions
 - Close all containers when finished

Loading Pesticides

- A. Select appropriate equipment for the job**
- B. Stand with back toward the wind when opening so pesticides blow away from you**
- C. Install an anti-siphoning device to prevent contamination of the water supply**
- D. Fill the tank with water (*NEVER leave the water unattended to prevent overflow*)**
- E. When possible add pesticide away from the water source**
- F. When possible, load the pesticide when the sprayer is in the field**

Applying Pesticides

- A. Set equipment for the appropriate delivery rate**
- B. Use recommended speed**
 - Assures uniformity in coverage
 - Prevents damage of equipment
- C. Before use, check sprayer for**
 - Loose connections
 - Worn hoses
 - Clogged equipment
- D. Observe weather**
 - Spraying is prohibited on windy days! (*It's the law. Wind could push pesticides onto nearby fields or into highly sensitive areas.*)
 - Don't apply in heavy rain (*pesticides could wash into non-target areas*)
 - Spray downwind from any sensitive areas or sensitive crops (*lakes, streams, schools*)



E. Follow re-entry instructions (*Time elapsed since application has been applied and before entering a sprayed area.*)

Don't enter sprayed areas until safe

Post warnings around treated areas

Know pre-harvest interval (*Time between pesticide application and harvesting a crop for consumption.*)

F. Cleaning up (*Appropriate clean up reduces contamination to non-target areas.*)

Pressure or thoroughly rinse all containers including hoses

Thoroughly clean equipment

- Clean sprayer with 1/8 cup detergent per gallon of water
- Rinse tank, hose and nozzle with detergent solution
- Flush with clean water
- Store tank upside down to allow drainage
- Sanitize clothing worn during spraying
 - ✓ Wash gloves with detergent and water before removing them
 - ✓ Wash clothing separate from family laundry
 - ✓ If pesticide has been spilled on clothes, rinse with large amounts of water before taking them off
 - ✓ Take a shower and put on new clothes immediately after spraying
 - ✓ Throw away heavily contaminated clothing

Safely dispose of

- Pesticides
- Containers (*There are laws regarding the disposal of pesticide containers. They can be poisonous like insecticides or pesticides, highly flammable like paint or hair spray. Pressurized containers can be explosive if disposed of near furnace or heaters.*)
- Rinse water (*could pollute groundwater, wells or streams if disposed of in the wrong place*)
- Keep cleaning supplies (*broom, dustpan, sand etc*) in an easily accessible storage facility
- Wash hands immediately following clean-up

Storing pesticides

- Well ventilated, dry area
- Keep the storage area locked (*can be very dangerous to children and animals*)
- Post areas with appropriate signage (*danger, caution etc. to notify firefighters or others of potential hazards*)
- Keep pesticides in original containers with labels to avoid confusion about contents and DO NOT store in food containers
- Don't keep a lot on hand – purchase them as needed
- Never store pesticides with fertilizer or livestock feed
- Don't store personal protective equipment (*respirators, gloves, goggles*) near pesticides



Pesticide poisonings

- Know symptoms of poisoning from the products being used
- Post emergency phone numbers by the phone
 - ✓ Poison control
 - ✓ Physician
 - ✓ Hospital
- Always take labels or Material Safety Data Sheet (MSDS) with you (*if you are calling Poison Control Center or if you're going to the emergency room*).

Conclusion

While agricultural chemicals have helped provide high-quality food and increase food production they must be applied carefully. When using and applying pesticides it is important to follow labels and directions exactly to protect the people the people around them and the people applying them as well as the environment.

Selected Resources:

1. Boehne, Richard. Material Safety Data Sheets: Practical Use at Home. *FACTS AND RESOURCES: Educational Resources Division of the National Safety Council*. June, 1997.
2. Baker, David E. Homeowner Chemical Safety. *University Extension, University of Missouri-Columbia*, October, 1993.