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Safe Use, Storage and Disposal of Pesticides

Marie Steinwachs
Office of Waste Management

Pesticides are chemicals designed to kill or repel living things that are considered by humans to be pests. Pesticides include insecticides, herbicides, rodenticides, fungicides, wood preservatives, molluscicides and disinfectants.

Household pesticides usually contain a small amount of the chemicals designed to kill the pest, called active ingredients, and a number of inert ingredients that are added to enhance the effectiveness of the application or use.

All household pesticides have some degree of toxicity and the potential to harm human health and the environment.

Dangers of Pesticides

Health

Besides the undesirable pests for which they are intended, pesticides can harm other organisms including pets, livestock, wildlife and people.

Exposure to pesticides can occur through ingestion, inhalation or skin absorption. Physical responses to pesticide exposure depend on the pesticide, amount of exposure, the age and over-all physical condition of the victim.

Children are far more susceptible to harm from exposure to pesticides than adults. Because of their lower body weight, exposure in children may result in more toxins per pound. Children are also especially sensitive to the neurotoxins often found in pesticides, because children's immune systems, organs, brains and nervous systems are still developing.

Acute poisoning from pesticides is an immediate reaction that occurs soon after exposure. The symptoms may mimic other conditions, such as the flu, so it is important not to ignore them if a possibility of pesticide poisoning exists. Symptoms can include skin irritation, dizziness, headache, confusion, shortness of breath, respiratory irritation, nausea, cramping, coma and death.

Chronic poisoning can result from repeated exposure to a pesticide over a long period of time. Symptoms can be similar to acute poisoning, but because symptoms may not appear until long after exposure, it is more difficult to isolate the cause. Some pesticides have been linked to cancer, birth defects, genetic mutations and neurologic conditions.

Environment

The environmental dangers posed by a pesticide depend on the amount of time it takes the pesticide to break down, the substances it breaks down into, its ability to be stored in body tissues, its toxicity to different organisms and the amount of exposure. The impact of pesticides is present upon our entire planet. A thin residue of pesticides is found in living tissues, soil, air and water supplies around the world.

Pesticides can spread through the environment from use and disposal. Excessive amounts of pesticides applied to gardens and lawns can run off and contaminate streams, rivers and groundwater.

When thrown away with household trash or poured down drains, pesticides may be released into the air, soil, surface

water or groundwater.

Pesticides can also damage ecosystems by killing not only the target pest but also other organisms, including beneficial predators. Damage to an organism caused by pesticides may not be immediately apparent to us, but may result in the organism's inability to reproduce or to carry out other functions.

Banned and restricted pesticides

Certain pesticides have been found to cause long-term environmental damage or to linger in food and water supplies. Some of these extremely damaging pesticides have been banned and should not, under any circumstances, be used. Other pesticides have been restricted for use only by persons who have been specially trained in their use.

Banned and restricted pesticides have been eliminated from household products in recent years, but older household pesticides may have been reclassified since the time of purchase. The older the pesticide, the better the chance that it has become restricted or banned, or that it has chemically deteriorated. As a general rule, any pesticide over five years old should not be used until you contact a knowledgeable authority to determine if the pesticide can still be used according to the directions on the label. Contact your local MU Extension center or the Department of Agriculture for information on the current classification of older pesticides.

Table 1
Signal words are required on pesticide labels to warn consumers of the acute toxicity of pesticides from inhalation, ingestion and skin absorption

Category	Signal word required on label	Approximate amount that can be fatal (based on ingestion)
I Highly toxic	DANGER; POISON	A few drops to one teaspoon
II Moderately toxic	WARNING	One teaspoon to one ounce
III Slightly toxic	CAUTION	More than one ounce
IV Not toxic	CAUTION	

Pesticide regulations

Pesticides have been regulated by the Environmental Protection Agency since 1972. Since then, a pesticide can be marketed only if it has been registered by the EPA and contains certain information on the label. Pesticide labels are one of the best sources of information available to the consumer. For example, consumers can determine the toxicity of a pesticide by reading the signal word on the label (Table 1).

Other information required on pesticide product labels.

- **Brand name**
  This is the most identifiable name for the product used in ads by manufacturer.
- **Common name**
  Chemicals with complex scientific names are often given a common name that does not vary between companies.
- **Ingredients**
  Active ingredients are listed by name and percent of total weight. Inert ingredients are listed as percent of total weight. Certain highly toxic, inert ingredients must be presented by name as well.
- **Formulation**
  Identifies if the pesticide is in liquid, wettable powder, emulsifiable concentration, dust or other formulation. Different types of formulations require different methods of handling.
- **"Keep out of reach of children"**
  This statement must appear on the front label.
- **Net contents**

The quantity of product in the container is expressed on the label in ounces, liters, pounds or other units.

- **Directions for use**
  Labels contain detailed descriptions of how to use the product properly within its legal requirements for the best results.

The user is violating the law if a pesticide is used in any manner contrary to the label directions.

Directions describe

- The specific pests the product is registered to control;
- The specific crops, animals or other items the product can be used on;
- In what form to apply the product and how to apply;
- How much to use;
- Where and when it should be applied;
- How frequently it should be applied;
- How soon the crop may be used or eaten after the product is applied.
- **Warning or caution statements**
  The hazards posed by the pesticide and how to avoid these hazards are described on the label. First aid information and references to recommended safety equipment are often provided.
- **Misuse statement**
  This places the responsibility on the user to use a pesticide according to label directions. Any manner of pesticide use inconsistent with these directions is a violation of federal law.
- **Registration and establishment numbers**
  Every pesticide product label must contain these numbers. Registration numbers are written as "EPA Registration number XXXX." Establishment numbers are the code for the factory that made the product.
- **Name and address of manufacturer or distributor**
  This information is included on pesticide labels to allow consumers to contact the company for more information on the product.

Reduce pesticide use

The best way to reduce the dangers associated with pesticides is to reduce your use of pesticides. Make sure you really need a pesticide before purchasing one. The "pest" may not actually pose a threat or may even be beneficial. You may be able to control pests through biological treatments, including the use of predators and pathogens, or mechanical treatments, such as trapping and hand-picking. Contact your local MU Extension center for information about pests or pest control methods that do not involve pesticides.

Prevention measures will reduce your chances of pest infestation. Take steps to eliminate conditions that are favorable to pests:

- Seal cracks or openings where pests may enter your home.
- Remove pest's access to sources of food and water.
- Vacuum your home frequently.
- Keep pets bathed and healthy.
- Eliminate home clutter or garden wastes.

Safe use

- Read the entire label before purchasing or using a pesticide, even if you have used the pesticide before. Do not rely on your memory for the very specific safety and use information provided on labels.
- Identify the specific pest to determine the proper treatment.
- If you absolutely need to use a pesticide, buy the least toxic pesticide recommended for your specific pest. The signal word on pesticide labels indicates the level of toxicity.
- Purchase only the amount needed to control the specific pest at that time.

- Make sure the pesticide is designated for use on the specific pest you are trying to control.
- Follow label directions carefully for preparation and application of pesticides.
- When mixing or using pesticides, wear clothing that covers the skin, unlined heavy rubber gloves, rubber footwear, hat and chemical splash goggles. An air-purifying respirator may also be required if an inhalation hazard exists. Safety equipment should be cleaned and dried after each use and stored separately from pesticides.
- Mix only the amount of pesticides you need. Mix or dilute pesticides outdoors or in a well-ventilated area.
- Do not spray pesticides outdoors on a windy day. When spraying outdoors, close the windows to your home.
- Do not water pesticide-treated areas immediately after application unless directed to do so by label directions.
- Pregnant women should avoid exposure to pesticides.
- Do not use pesticides near children or pets.
- Do not let children or pets play on or near lawns or parks where pesticides have recently been applied.
- Avoid applying pesticides to blooming plants where pollinating insects are working, or to birds' nests.
- Do not drink alcohol within 24 hours of using pesticides. Alcohol can intensify the toxic effects of some pesticides.
- Remove food, dishes, pots and pans from any area that you are treating.
- After treating a room with pesticides, avoid entering the room for the period of time recommended on the product label. After this time period, open all windows to ventilate and clean all contaminated surfaces with hot water and detergent.
- Any clothing contaminated with pesticides should be washed separately from other laundry. First, rinse clothing outdoors with a hose or in a washing machine pre-soak. Use hot water (140 degrees Fahrenheit) to launder, a full water level setting, and the normal wash cycle. Contaminated clothing may need to be washed two or three times. Line-dry the clothing to avoid contaminating your dryer. Heavily contaminated clothing should be discarded. Disposable protective clothing is available through safety equipment suppliers.

Safe storage

- To reduce storage problems, buy only enough pesticide for one season's use.
- Keep pesticides in their original containers with the labels intact.
- Store in a separate, locked cabinet or other secure structure, away from children and pets.
- Do not store pesticides in cabinets near food, medical supplies or cleaning products.
- Do not store pesticides near water supplies.
- Flammable pesticides should be stored away from sources of heat, flame, or spark.
- Store pesticides in a dry area to prevent the deterioration of containers.
- Inspect pesticide containers frequently for damage.
- Before storing a pesticide outside or in an unheated space, check with your local MU Extension center, the manufacturer, or distributor to make sure the pesticide will not be destroyed by freezing.

Disposal

- Unless the pesticide is banned or restricted, it should be completely used up according to label directions.
- Empty containers should be pressure rinsed if this option is available in your community, or triple rinsed. To triple rinse, fill the container 1/4 full with water, close it tightly, and shake. Rinse water should be applied to an area you are treating. Follow the same precautions used when applying the pesticide. Repeat this procedure two more times. Then discard the container with your solid waste. Do not triple rinse pesticide containers in a household sink.
- Never pour leftover pesticides down the drain. Pesticides can interfere with the operation of the wastewater treatment plant or septic system. Never pour pesticides into storm drains. These often lead directly to area streams and rivers.
- Give a leftover pesticide to someone who can use it up if the product is in its original container and the directions are legible. Do not exchange a banned pesticide or give a restricted pesticide to a person who is not licensed in its use.
- If a pesticide is banned, restricted, chemically deteriorated, or if you cannot use it, then it must be secured and held for a household hazardous waste collection. Contact local waste officials, Department of Natural Resources, or the Household Hazardous Waste Project to find out about collection programs in your area.

Procedure for securing and holding pesticides

- Protect the label. Store substances in their original containers. If an item is not in its original container, clearly label the current container with the product's name and date. Place the word DANGER on the container.
- If the product is in a rusting metal or a breakable container, this container should be placed within a larger, plastic container. The plastic container should be overpacked with a non-flammable absorbent, such as clay-based kitty litter, to help contain any possible leaks. **Warning: Using flammable materials such as non-clay kitty litter or newspapers for overpacking may lead to spontaneous combustion (fire)**
  Clearly label the outside container with the contents and date. Place the word DANGER on the outside container.
- If the pesticide is flammable, store it away from all sources of heat, spark and flame. Light switches, electrical appliances, garage door openers and other switches can all be sources of sparks.
- Store containers out of the reach of children and pets in a separate locked cabinet or other secure structure.

Other sources of information

- The National Pesticide Information Center provides information on toxicity, environmental and human health effects and proper use of pesticides.
  800-858-7378.
- The Bio-Integral Resource Center provides publications on least-toxic recommendations for solving pest problems. For a publications catalog, send $1 to Bio-Integral Resource Center, P.O. Box 7414, Berkeley, Calif. 94707
  510-524-2567.

The *Guide to Hazardous Products Around the Home* is a personal action manual for protecting your health and the environment. This comprehensive, 178-page handbook explains product ingredients, safety issues, disposal, recycling outlets, safer product alternatives, and more! Promoted by Greenpeace, the United Nations Environmental Programme, *50 Simple Things You can do to Save the Earth* and *The Green Consumer.* The *Guide* was written by the Household Hazardous Waste Project, winner of the 1991 President's Environment and Conservation Challenge Award.

The Household Hazardous Waste Project assumes no responsibility for any injury or damage resulting from the use or effect of any product or information specified in this publication.

Related MU Extension publications

- WM6001, Safe Use, Storage and Disposal of Paint
  http://extension.missouri.edu/p/WM6001
- WM6002, Selecting Household Safety Equipment
  http://extension.missouri.edu/p/WM6002
- WM6003, Household Hazardous Products
  http://extension.missouri.edu/p/WM6003
- WM6004, Managing Household Hazardous Waste
  http://extension.missouri.edu/p/WM6004
- WM6005, Store Hazardous Products Safely
  http://extension.missouri.edu/p/WM6005
- WM6006, Identifying Product Hazards: Material Safety Data Sheets
  http://extension.missouri.edu/p/WM6006
- WM6007, Setting Up a Used Antifreeze Collection Site
  http://extension.missouri.edu/p/WM6007
- WM6009, Setting Up a Used Latex Paint Collection Site
  http://extension.missouri.edu/p/WM6009

- WM6010, Setting Up a Used Oil Collection Site
  http://extension.missouri.edu/p/WM6010
- WM6011, Storm Drains and Water Quality
  http://extension.missouri.edu/p/WM6011

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