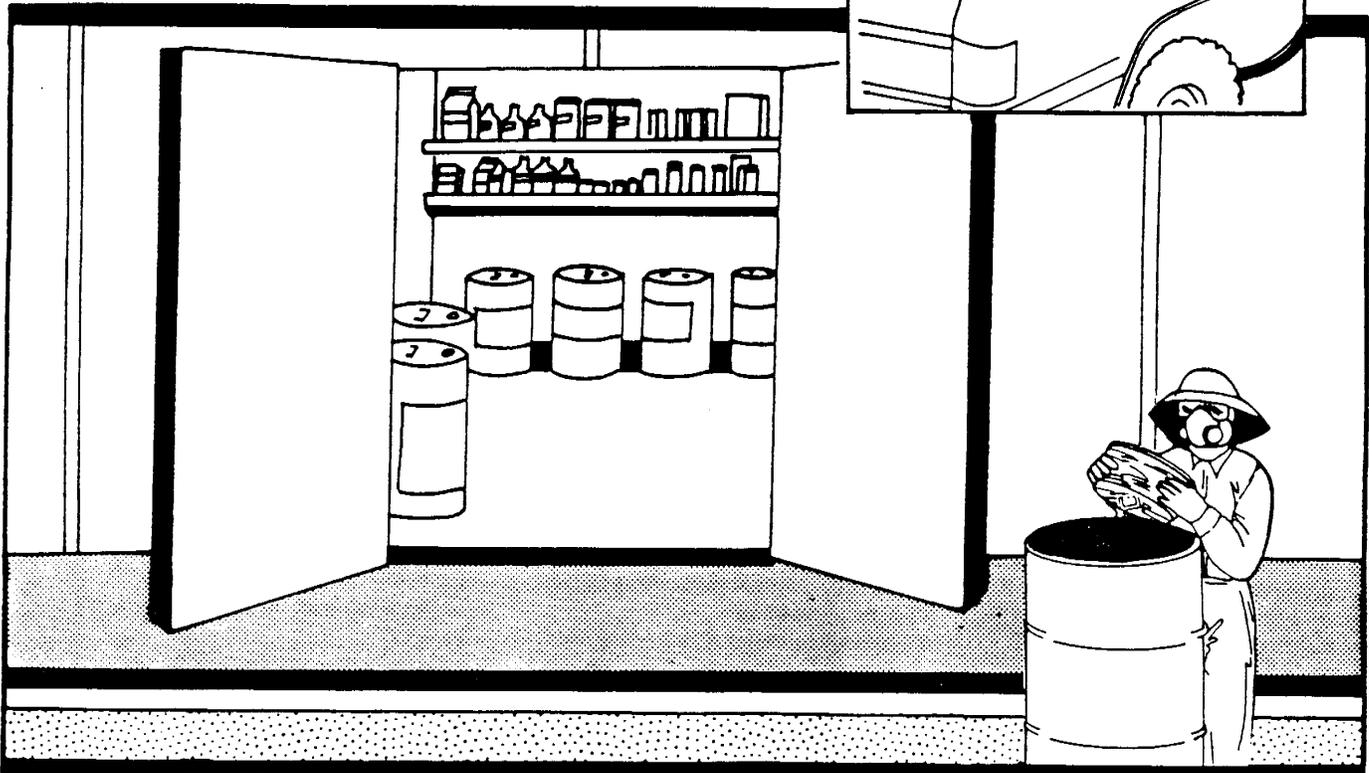
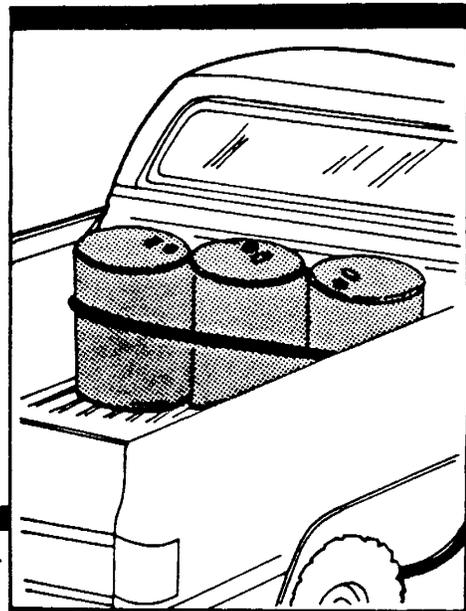
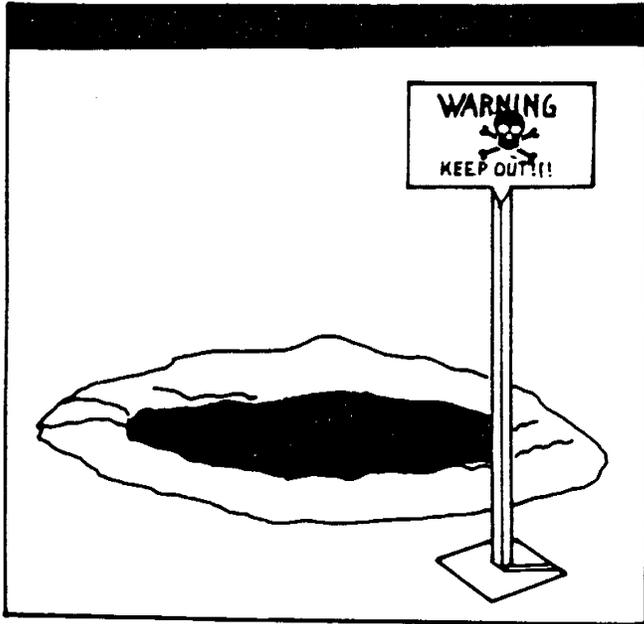
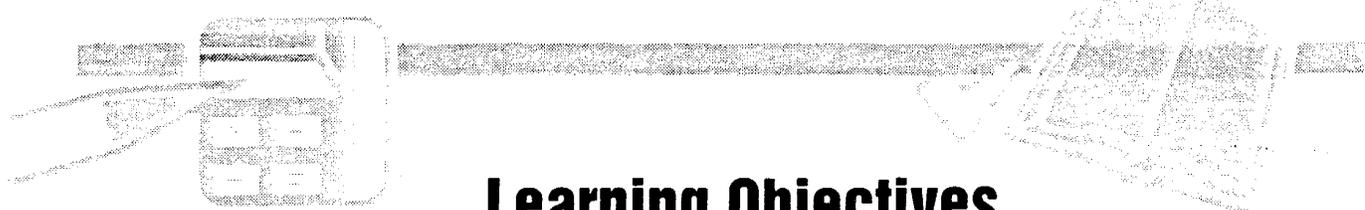


Transportation, Storage, Disposal, and Spill Cleanup





Learning Objectives

After you complete your study of this unit, you should be able to:

- List safety precautions for transporting pesticides in a vehicle.
- Describe how to protect pesticide containers during transport.
- Name actions needed to establish and maintain a safe storage site.
- Describe what to do when a pesticide container leaks.
- Explain what to do with excess pesticides that are still usable.
- List acceptable ways to dispose of pesticide wastes.
- List ways to avoid the need to dispose of pesticide containers.
- Explain the “three C’s” of spill management and steps to take in each.
- List sources of assistance for managing a spill.
- Explain when a spill kit should be on hand.

Terms To Know

Active ingredients— The chemicals in a pesticide product that control the target pest.

Chemical-resistant— Able to prevent movement of the pesticide through the material during the period of use.

Collection pad— A safety system designed to contain and recover spills, leaks, rinsates, and other pesticide-containing substances.

Decontaminate— Remove pesticide from surfaces or organisms that are exposed so no further harm or damage can occur.

Diluent— Anything used to dilute a pesticide.

Drift— Pesticide movement away from the release site in the air.

Exposure— Coming into contact with a pesticide; getting a pesticide on a surface or in or on an organism.

Eyewash dispenser— Commercially available system for flushing contaminants out of the eyes.

Fumigant— Pesticide that is a vapor or gas or that forms a vapor or gas when applied and whose pesticidal action occurs in the gaseous state.

Ground water— Water beneath the earth’s surface in soil or rock.

Labeling— The pesticide product label and other accompanying materials that contain directions that pesticide users are legally required to follow.

Nonporous surfaces— Surfaces that have no openings to allow liquid to be absorbed or pass through.

OSHA— Occupational Safety and Health Administration in the United States Department of Labor.

Personal protective equipment (PPE)— Devices and clothing worn to protect the human body from contact with pesticides or pesticide residues.

Pesticide handler— Person who directly works with pesticides, such as during mixing, loading, transporting, storing,

disposing, and applying, or working on pesticide equipment.

Petroleum-based— Made from petroleum products.

Runoff— The movement of pesticide away from the release site in water or another liquid flowing horizontally across the surface.

Sensitive— Particularly vulnerable to harm from pesticide exposure.

Solvent— A liquid, such as water, kerosene, xylene, or alcohol, that will dissolve a pesticide (or other substance) to form a solution.

Surface water— Water on top of the earth’s surface, such as in lakes, streams, rivers, irrigation ditches, or storm water drains.

Toxicity— Measure of a pesticide’s ability to cause acute, delayed or allergic effects.

Volatile— Evaporating rapidly; turning easily into a gas or vapor.

When you transport, store, or dispose of pesticides and their containers, you must take safety precautions. You can prevent many pesticide accidents, and reduce the severity of others, if you are prepared before you start these tasks. Before you begin any pesticide handling task, know what do to in case of spills and have the proper spill cleanup equipment on hand.

Transportation of Pesticides

You are responsible for the safe transport of pesticides in your possession. Carelessness in transporting pesticides can result in broken containers, spills, environmental contamination, and harm to yourself and others. Accidents can occur even when you are transporting materials a short distance. Do all you can to prevent a mishap, but be prepared in case of emergency. Before transporting pesticides, you should know what to do if a spill occurs. If any pesticide is spilled in or from the vehicle, take action right away to make sure the spill is cleaned up correctly.



Vehicle Safety

The safest way to transport pesticides is in the back of a truck. Flatbed trucks should have side and tail racks. Steel or plastic-lined beds are best, because they can be more easily cleaned if a spill occurs.

Never carry pesticides in the passenger section of your car, van, or truck. Hazardous vapors may be released and make the driver and other passengers ill. Pesticides may cause illness or injury if they spill on you or your passengers. It is nearly impossible to completely remove spills from the fabric of seats and floor mats. They can cause future contamination if they are not cleaned up correctly. If you must transport pesticides in the back of a station wagon, open the side windows and do not allow anyone to ride in the back.

Never allow children, other passengers, and pets to ride with pesticides.

Never transport pesticides with food, clothing, or other things meant to be eaten by or in contact with people or animals. The risk of contamination is too high. Even small amounts of pesticide could contaminate these highly sensitive items. A spill could cause major injury.

Never leave your vehicle unattended when transporting pesticides in an unlocked trunk compartment or open-bed truck. You are responsible and liable if curious children or careless adults are accidentally poisoned by the pesticides. Whenever possible, transport pesticides in a locked compartment.

Consider transporting highly volatile pesticides in separate trips from other chemicals. Spills, or even fumes from opened containers, can make the other chemicals worthless.

Transporting Pesticide Containers

Transport pesticides only in containers with intact, undamaged, and readable labels. Inspect containers before loading to be sure that all caps, plugs, and other openings are tightly closed and that there are no pesticides on the outside of the containers. Handle containers carefully to avoid rips or punctures.

Anchor all containers securely to keep them from rolling or sliding. Packing or shipping containers provide extra cushioning. Protect paper and cardboard containers from moisture, because they become soggy and split easily when wet.

Protect pesticides from extreme temperatures during transport. Extremely hot or cold temperatures can damage pesticide containers by causing them to melt or become brittle. Such temperatures also may reduce the usefulness of the pesticides.

Labeling Statements About Transportation

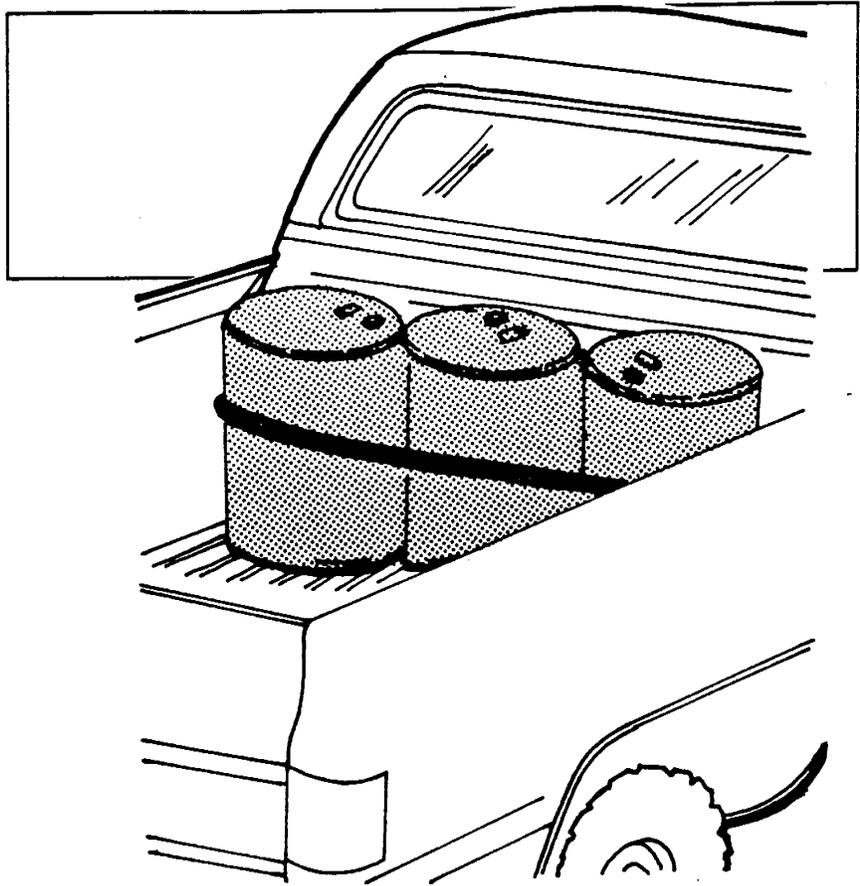
Typical pesticide labeling instructions about transportation include:

Do not ship with food, feeds, drugs, or clothing.

Do not transport damaged or leaking container.

In case of a transportation emergency involving a spill, fire, or exposure, call [telephone number] 24 hours a day.

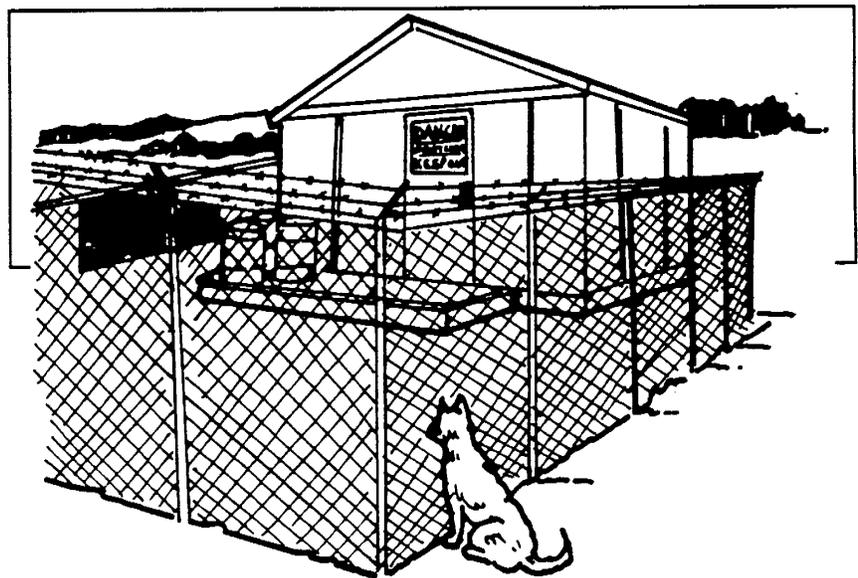
Do not transport in or on vehicles containing foodstuffs or feeds.

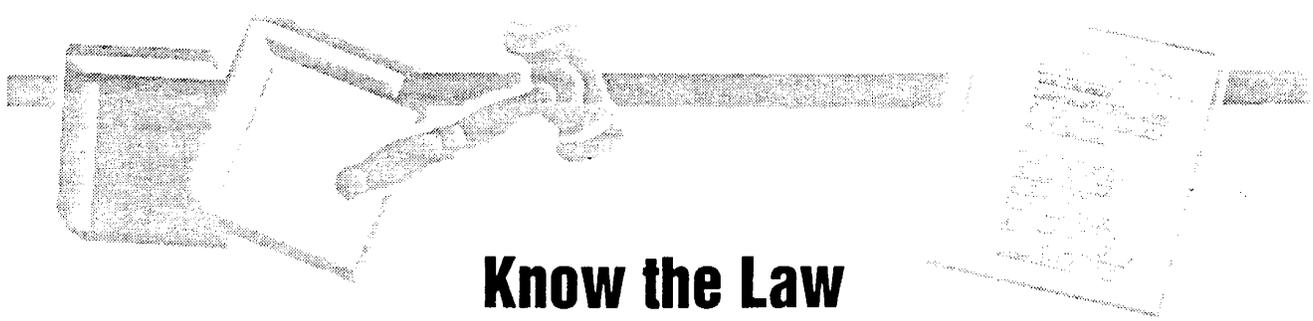


Pesticide Storage

Many pesticide handlers use existing buildings or areas within existing buildings for pesticide storage. However, if large

amounts of pesticides will be stored, it is best to build a special storage building just for pesticide needs.





Know the Law

Some pesticide applicators, applicator businesses, and dealers may be affected by Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III), administered by the Environmental Protection Agency. SARA Title III has many sections; three relate to the storage of pesticides:

Emergency planning and notification

Under certain conditions, the law requires you to notify State and local officials about the location and amount of hazardous chemicals at your site. EPA has assigned a Threshold Planning Quantity (TPQ) for a number of active ingredients (not total weight of formulated product). When the product in

storage is at or above the TPQ, you must notify the State Emergency Response Commission (SERC) in writing. Each facility must designate a coordinator to work with the Local Emergency Planning Committee (LEPC). The State will notify the LEPC that your operation is covered under SARA. This is a one-time notification.

Material Safety Data Sheet (MSDS) reporting

Employers are required to obtain and keep material safety data sheets. They must submit copies of each MSDS (or a listing of MSDS's that must be maintained) to their local fire department, the LEPC, and the SERC. There is one exclusion: if a chemical is used solely for household, consumer, or agricultural

purposes, notification is not required. However, under OSHA regulations, pesticide users (except homeowners) must have the MSDS for each pesticide they handle.

Annual inventory reporting

All regulated facilities must submit an annual chemical inventory to their local fire department, LEPC, and SERC. This inventory must include:

- all hazardous chemicals stored at the facility in quantities of 10,000 pounds or more, and
- all extremely hazardous chemicals stored in quantities of 500 pounds (or 55 gallons) or more, or in a quantity that exceeds the TPQ, whichever is less.

Agricultural producers are exempt from this section.

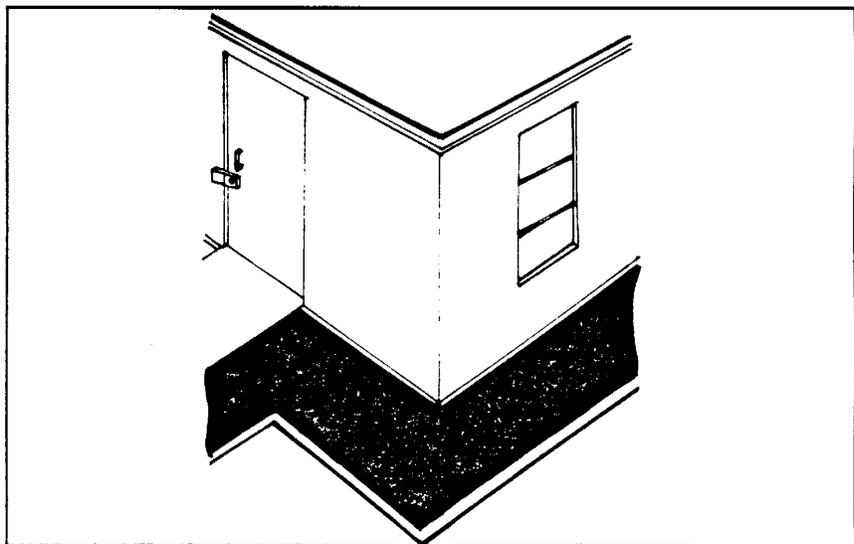
Establish a Storage Site

A correctly designed and maintained pesticide storage site is essential. A suitable storage site:

- protects people and animals from accidental exposure.
- protects the environment from accidental contamination.
- prevents damage to pesticides from temperature extremes and excess moisture.
- protects the pesticides from theft, vandalism, and unauthorized use, and
- reduces the likelihood of liability.

Secure the site

Keeping out unauthorized people is an important function of



the storage site. Whether the storage site is as small as a cabinet or closet or as large as an entire room or building, keep it securely

locked. Post signs on doors and windows to alert people that pesticides are stored there. Post "No smoking" warnings.

Prevent water damage

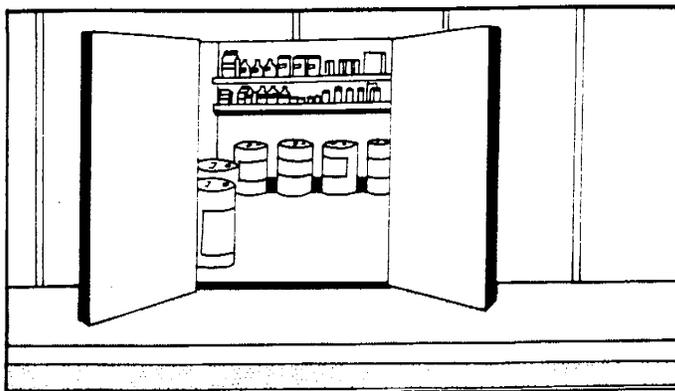
Choose a storage site where water damage is unlikely to occur. Water from burst pipes, spills, overflows, excess rain or irrigation, or flooding streams can damage pesticide containers and pesticides. Water or excess moisture can cause:

- metal containers to rust,
- paper and cardboard containers to split or crumble,
- pesticide labeling to peel, smear, run, or otherwise become unreadable,
- dry pesticides to clump, degrade, or dissolve,
- slow-release products to release their pesticide, and
- pesticides to move from the storage site into other areas.

If the storage site is not protected from the weather or if it tends to be damp, consider placing metal, cardboard, and paper containers in sturdy plastic bags or cans for protection. Large metal containers, which may rust when damp, often can be placed on pallets within the storage site.

Control the temperature

The storage site should be indoors, whenever possible. Choose a cool, well-ventilated room or building that is insulated or temperature-controlled to prevent freezing or overheating. The pesticide labeling may tell you at what temperatures the product should be stored. Freezing temperatures can cause glass, metal, and plastic containers to break. Excessive heat can cause plastic containers to melt, some glass containers to explode, and some pesticides to volatilize and drift away from the storage site. Temperature extremes can destroy the potency of some pesticides.



Provide adequate lighting

The storage site should be well lighted. Pesticide handlers using the facility must be able to see well enough to:

- read pesticide container labeling,
- notice whether containers are leaking, corroding, or otherwise disintegrating, and
- clean up spills or leaks completely.

Use nonporous materials

The floor of the storage site should be made of sealed cement, glazed ceramic tile, no-wax sheet flooring, or another easily cleaned material. Carpeting, wood, soil, and other absorbent floors are difficult or impossible to decontaminate in case of a leak or spill. For ease of cleanup, shelving and pallets should be made of nonabsorbent materials such as plastic or metal. If wood or fiberboard materials are used, they should be

coated or covered with plastic or polyurethane or epoxy paint.

Prevent runoff

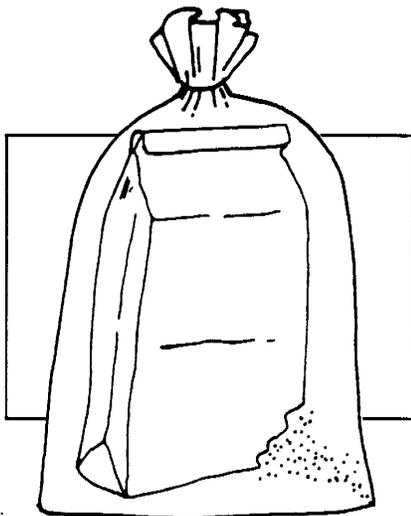
Inspect the storage site to determine the likely path of pesticides in case of spills, leaks, drainage of equipment wash water, and heavy pesticide runoff from firefighting or floods. Pesticide movement away from the storage site could contaminate sensitive areas, including surface water or ground water. If your storage site contains large amounts of pesticides, you may need to use a collection pad to contain pesticide runoff.

Provide clean water

Each storage site must have an immediate supply of clean water. Potable running water is ideal. If running water is not practical, use a carboy or other large, sealable container with clean water. Changing the water in a container at least once each week will ensure that it remains safe for use on skin and eyes. Keep an eye-wash dispenser immediately available for emergencies.

Maintain the Storage Site Prevent contamination

Store only pesticides, pesticide containers, pesticide equipment, and a spill cleanup kit at the storage site. Do not keep food, drinks, tobacco, feed, medical or



veterinary supplies or medication, seeds, clothing, or personal protective equipment (other than personal protective equipment necessary for emergency response) at the site. These could be contaminated by vapors, dusts, or spills and cause accidental exposure to people or animals.

Keep labels legible

Store pesticide containers with the label in plain sight. Costly errors can result if the wrong pesticide is chosen by mistake. Labels should always be legible. They may be damaged or destroyed by exposure to moisture, dripping pesticide, diluents, or dirt. You can use transparent tape or a coating of lacquer or polyurethane to protect the label. If the label is destroyed or damaged, request a replacement from the pesticide dealer or the pesticide formulator immediately.

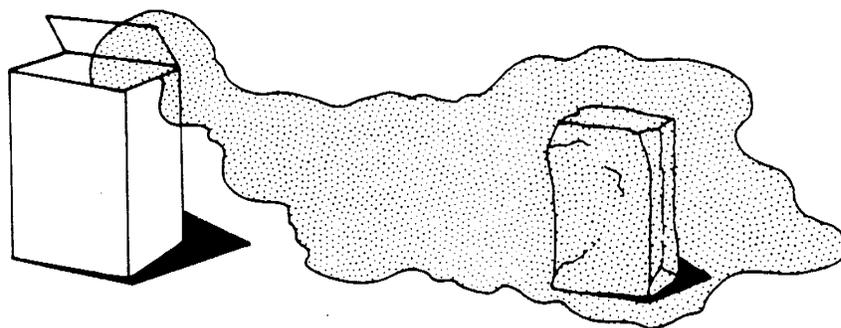
Keep containers closed

Keep pesticide containers securely closed whenever they are being stored. Tightly closed containers help protect against:

- a spill,
- cross-contamination with other stored products,
- evaporation of liquid pesticides or the solvent,
- clumping or caking of dry pesticides in humid conditions, and
- dust, dirt, and other contaminants getting into the pesticide, causing it to be unusable.

Use original containers

Store pesticides in their original containers. Never put pesticides in containers that might cause children and other people to mistake them for food or drink. You are legally responsible if someone or something is injured



by pesticides you have placed in unlabeled or unsuitable containers.

Watch for damage

Inspect containers regularly for tears, splits, breaks, leaks, rust, or corrosion. When a container is damaged, put on appropriate personal protective equipment and take immediate action. If the damaged container is an aerosol can or fumigant tank that contains pesticides under pressure, use special care to avoid accidentally releasing the pesticide into the air. When a container is damaged:

- Use the pesticide immediately at a site and rate allowed by the label, or
- Transfer the pesticide into another pesticide container that originally held the same pesticide and has the same label still intact, or
- Transfer the contents to a sturdy container that can be tightly closed. If possible, remove the label from the damaged container and use it on the new container. Otherwise, temporarily mark the new container with the name and EPA registration number of the pesticide, and get a copy of the label from the pesticide dealer or formulator (whose telephone number is usually on the label) as soon as possible, or
- Place the entire damaged container and its contents into a suitable larger container. Consider this option carefully, however. Many times the label on the leaking container becomes

illegible. The pesticide is useless and becomes a disposal problem unless you know the name and registration number and can get a copy of the label.

Store volatile products separately

Volatile pesticides, such as some types of 2,4-D, should be stored apart from other types of pesticides and other chemicals. A separate room is ideal. Vapors from opened containers of these pesticide can move into other nearby pesticides and chemicals and make them useless. The labeling of volatile herbicides usually will direct you to store them separately from seeds, fertilizers, and other types of pesticides.

Isolate waste products

If you have pesticides and pesticide containers that are being held for disposal, store them in a special section of the storage site. Accidental use of pesticides meant for disposal can be a costly mistake. Clearly mark containers that have been triple rinsed or cleaned by an equivalent method, because they are more easily disposed of than unrinsed containers.

Know your inventory

Keep an up-to-date inventory of the pesticides you have in storage. Each time a pesticide is added to or removed from the storage site, update the inventory list. The list

will help you keep track of your stock and will be essential in a fire or flood emergency. The inventory list also will aid in insurance settlements and in estimating future pesticide needs.

Do not store unnecessarily large quantities of pesticides for long periods of time. Buy only as much as you will need for a year at most. Pests, pesticides, or pesticide registrations may change by the next year and make the pesticides useless. Some pesticides have a relatively short shelf life and cannot be carried over from year to year.

Consider shelf life

Mark each pesticide container with the date of purchase before it is stored. Use older materials first. If the product has a shelf life listed in the labeling, the purchase date will indicate whether it is still usable. Excessive clumping, poor suspension, layering, or abnormal coloration may be indications that the pesticide has broken down. However, sometimes pesticide deterioration from age or poor storage conditions becomes obvious only after application. Poor pest control or damage to the treated surface can occur. If you have doubts about the shelf life of a pesticide, call the dealer or manufacturer for advice.

Prevent Pesticide Fires

Some pesticides are highly flammable; others do not catch

fire easily. The labeling of pesticides that require extra precautions often will contain a warning statement in either the "Physical/Chemical Hazards" section or the "Storage and Disposal" section.

Pesticides that contain oils or petroleum-based solvents are the ones most likely to contain these warning statements. Some dry products also present fire and explosion hazards.

Store combustible pesticides away from open flames and other heat sources, such as steam lines, heating systems, kerosene heaters or other space heaters, gas-powered equipment, or incinerators. Do not store glass containers in sunlight where they can focus the heat rays and possibly explode or ignite. Install fire detection systems in large storage sites, and equip each storage site with a working fire extinguisher that is approved for all types of fires, including chemical fires.

If you store highly toxic pesticides or large amounts of any pesticides, inform your local fire department, hospital, public health officials, and police of the location of your pesticide storage building before a fire emergency occurs. Tell fire department officials what types of pesticides are regularly stored at the site, give them a floor plan, and work with them to develop an emergency response plan.

Labeling Statements About Storage

Typical pesticide labeling instructions about storage include:

Store at temperatures above 32 °F.

Do not contaminate feed, foodstuffs, or drinking water during storage.

Store in original container only.

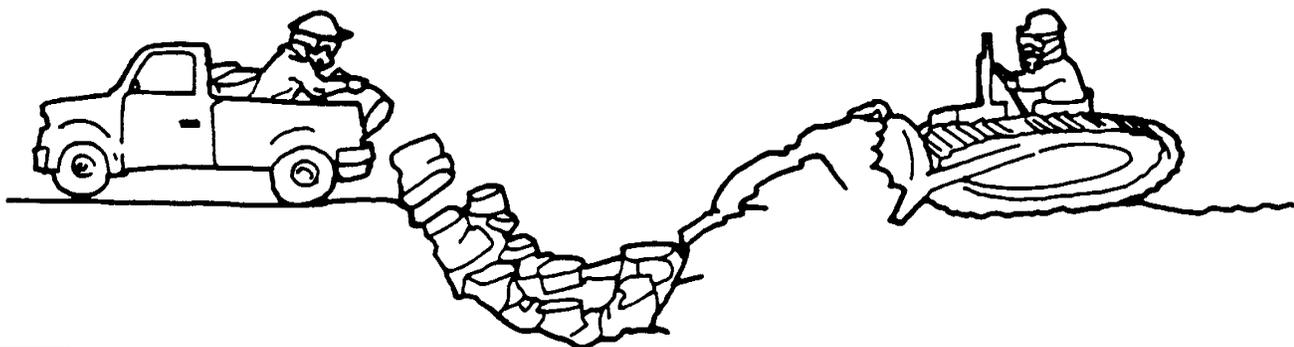
In outside storage areas, store drums on sides to avoid accumulation of rain water in top or bottom of recessed areas.

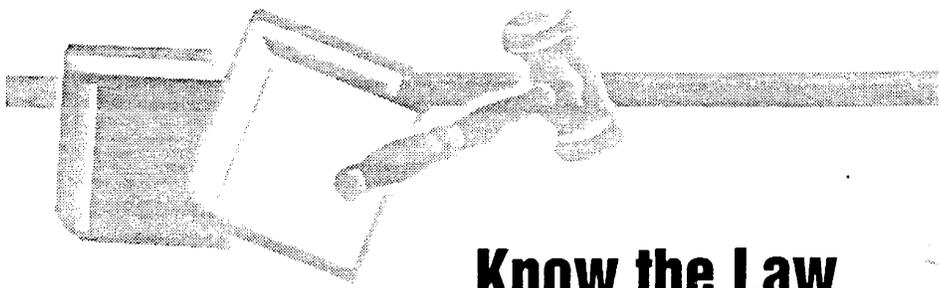
Do not store near ignition sources such as electrical sparks, flames, or heated surfaces.

Flammable. Do not use, pour, spill, or store near heat or open flame. Do not cut or weld container.

Disposal

Pesticide users are responsible for correctly dealing with empty pesticide containers, excess usable pesticides, and waste materials that contain pesticides or their residues. There is growing concern about the serious harm to humans and the environment that incorrect disposal of pesticide wastes can cause. For information on disposal options available in your local area, contact your State or tribal pesticide authority.





Know the Law

The U.S. Environmental Protection Agency (EPA) regulates wastes under the **Resource Conservation and Recovery Act (RCRA)**. EPA issues a list of materials that are considered hazardous. However, RCRA applies to certain flammable, corrosive, reactive, or toxic wastes, even if they are not on the list. Therefore, some other pesticides could be "regulated hazardous wastes" under RCRA. States and tribes often have their own hazardous waste laws, which may be more stringent than

RCRA. Contact your State or tribal authority for applicable requirements.

"Wastes" include unrinsed containers, excess pesticides and pesticide dilutions, and rinse and wash water that contain a listed chemical and cannot be used. Triple-rinsed pesticide containers are not considered hazardous waste under RCRA, however. They can be disposed of in sanitary landfills.

RCRA regulates pesticide users who accumulate wastes of acutely toxic pesticides totaling 2.2

pounds or more per month or wastes of any RCRA-regulated pesticides totaling 2,200 pounds per month. Such users must register as a generator of hazardous waste, obtain an ID number from EPA, State, or tribe and follow certain disposal requirements.

To find out if a pesticide is listed in RCRA, call:

EPA RCRA Hotline 1-800-424-9346

**8:30 a.m. - 7:30 p.m. EST,
Monday through Friday.**

Excess Pesticides

The best solution to the problem of what to do with excess pesticides is to take steps to avoid having them:

- Buy only the amount needed for a year or a season.
- Calculate carefully how much diluted pesticide is needed for a job and mix only that amount.
- Use all the mixed pesticide in accordance with labeling instructions.

If you have excess pesticides that are usable, first try to find a way to use them as directed on the label. The best option is to **apply the pesticide** on a site listed in the use directions on the pesticide labeling, under the following conditions:

- The total amount of pesticide active ingredient applied to the site, including all previous applications, must not exceed the rate and frequency allowed on the labeling.
- You must comply with other application instructions specified

on the labeling.

If you have pesticide products in their original containers that you cannot use, you may be able to find another pesticide handler who can. Or you may be able to return them to a dealer, formulator, or manufacturer.

Most container rinsates should not become excess pesticides, because they can be added into the tank during the mixing process. You also may be able to add some rinsates from equipment cleaning, spill cleanup, and other activities to a tank mixture that contains the same pesticide, as long as doing so will not violate labeling instructions. Some rinsates will contain dirt, cleaning agents, or other substances that will make them unusable, however.

Pesticide Wastes

Excess pesticides and rinsates that cannot be used must be disposed of as wastes. Other pesticide wastes include such things as contaminated spill

cleanup material and personal protective equipment items that cannot be cleaned and reused. Whenever possible, avoid creating pesticide wastes that require disposal.

Sometimes pesticide wastes can be disposed of in a landfill operating under EPA, State, tribal, or local permit for hazardous wastes. Most sanitary landfills are not suitable. Some regions have pesticide incinerators for disposing of pesticide wastes. Never burn, bury, or dump excess pesticides, and never dispose of them in a way that will contaminate public or private ground water or surface water or sewage treatment facilities.

Pesticide wastes that cannot be disposed of right away should be marked to indicate the contents and then stored safely and correctly until disposal is possible.

Labeling statements about waste disposal

Typical pesticide labeling instructions about disposal of pesticide wastes include:

Do not contaminate water by disposal of wastes.

Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Containers

Try to avoid the need to dispose of pesticide containers as wastes. For example, you may be able to:

- use containers that are designed to be refilled by the pesticide dealer or the chemical company,
- arrange to have the empty containers recycled or reconditioned, or
- use soluble packaging.

If you have containers that you must dispose of, be sure to rinse them, if possible. Rinsed containers are easier to dispose of than unrinsed containers.

Refillable containers

Some types of containers are designed to be refilled with pesticide repeatedly during their lifetime, which may be many years. They usually are not designed to be triple rinsed or pressure rinsed by the pesticide user. When necessary, they are cleaned by the pesticide dealer or chemical company before refilling. Common types of refillable containers include minibulks and small-volume returnables.

Recyclable and reconditionable containers

You may be able to take your rinsed metal or plastic containers to a facility that can recycle them. Some 55- and 30-gallon drums can be returned to the dealer, manufacturer, or formulator to be reconditioned and reused.

Soluble containers

Soluble containers are designed to be placed, unopened, into the mixing tank. The container dissolves in the solvent (usually water) in the tank. Only the overpackaging remains, and it may be disposed of as nonhazardous waste in a sanitary landfill.

Triple-rinsed or pressure-rinsed containers

Containers that have been correctly triple rinsed or pressure rinsed usually may be disposed of

as regular trash in a sanitary landfill, unless prohibited by the pesticide labeling or by State, tribal, or local authorities. Mark the containers to show that they have been rinsed.

Unrinsed containers

To dispose of unrinsed containers, you may take them to an incinerator or landfill operating under EPA, State, or tribal permit for hazardous waste disposal. If this is not possible, check with your State, tribal, or local authorities to find out what to do. Otherwise, you may need to store the containers until you have a way to dispose of them.

Burnable containers

The labeling of some paper, cardboard, and plastic containers may list "burning, if allowed by State and local authorities" as a disposal option for pesticide containers. However, open burning of pesticide containers and waste pesticides is a questionable practice and may be in violation of Federal regulations that could take precedence over the instructions on the pesticide labeling. Because of possible air pollution hazard and the risks of liability, your best option is to use another disposal method for these containers.

Labeling statements about container disposal

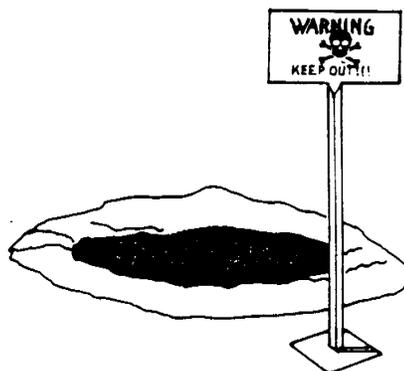
Typical pesticide labeling instructions about disposal of pesticide containers include:
Do not reuse empty containers.

Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incinerate.

Dispose of bag in a sanitary landfill or by incineration.

Spill Management

A spill is any accidental release of a pesticide. As careful as people try to be, pesticide spills can and do occur. The spill may be minor, involving only a dribble from a container, or it may be major, involving large amounts of



pesticide or pesticide-containing materials such as wash water, soil, and absorbents.

You must know how to respond correctly when a spill occurs. Stopping large leaks or spills is often not simple. If you cannot manage a spill by yourself, get help. Even a spill that appears to be minor can endanger you, other people, and the environment if not handled correctly. Never leave a spill unattended. When in doubt, get assistance.

You can get help from Chemtrec (Chemical Transportation Emergency Center) by calling 1-800-424-9300. This number is for emergencies only.

The faster you can contain, absorb, and dispose of a spill, the less chance there is that it will cause harm. Clean up most spills immediately. Even minor dribbles or spills should be cleaned up before the end of the work day to keep unprotected persons or animals from being exposed.

A good way to remember the steps for a spill emergency is the "three C's: Control, Contain, Clean up.

Control the Spill Situation

Protect yourself

Put on appropriate personal protective equipment before contacting the spill or breathing its fumes. If you do not know how toxic the pesticide is or what type of personal protective equipment to wear, don't take a chance! Wear foil-laminate apron, footwear, and gloves; eye protection; and a respirator.

Stop the source

If a small container is leaking, place it into a larger chemical-

resistant container, such as a plastic drum or bag. If a spray tank is overflowing, stop the inflow and try to cap off the tank. If a tank, hopper, or container has burst or has tipped over and is too heavy to be righted, you will not be able to stop the source.

Protect others

Isolate the spill site by keeping children, other unprotected people, and animals well back. Rope off the site if necessary. If you suspect the spill contains a highly volatile or explosive pesticide, you may need to keep people back even farther. Warn people to keep out of reach of any drift or fumes. Do not use road flares or allow anyone to smoke if you suspect the leaking material is flammable.

Stay at the site

Do not leave the spill site until another knowledgeable and correctly protected person arrives.

Someone should be at the spill site at all times until the spill is cleaned up.

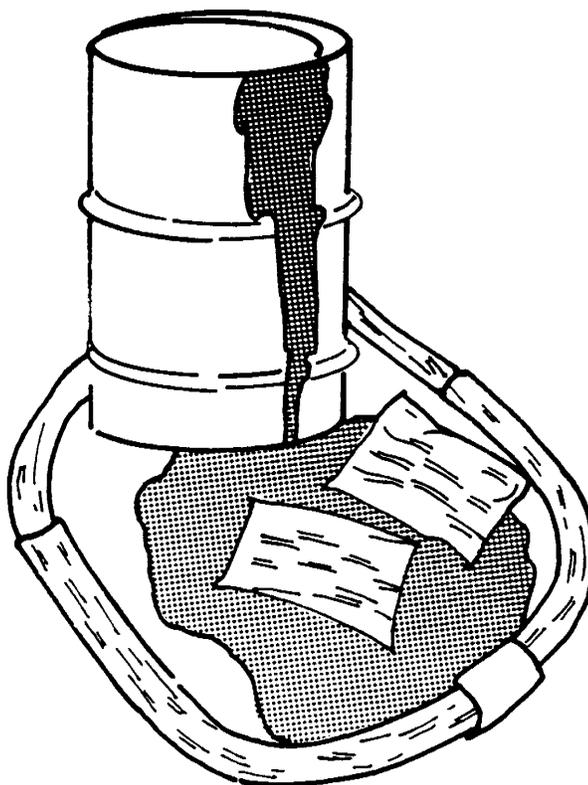
Contain the Spill

Confine the spill

As soon as the source of the leak is under control, move quickly to keep the spill in as small an area as possible. Do everything you can to keep it from spreading or getting worse. For small spills, use containment snakes to surround the spill and keep it confined. For larger spills, use a shovel, a rake, or other tool or equipment to make a dike of soil, sod, or absorbent material.

Protect water sources

Keep the spill out of any body of water or any pathway that will lead to water, such as a ditch, floor drain, well, or sinkhole. If the spilled pesticide is flowing towards such an area, block it or redirect it.



Absorb liquids

Liquid pesticide spills can be further contained by covering the entire spill site with absorbent materials, such as spill pillows, fine sand, vermiculite, sawdust, clay, kitty litter, shredded newspaper, or absorbent pads.



Cover dry materials

Prevent dry, dusty pesticide spills, such as dusts, powders, or granules, from becoming airborne by covering them with a sweeping compound or a plastic covering or by very lightly misting the material with water. Do not mist too much, because water may release the pesticidal action or may cause the pesticide to form clumps and be unusable.

Warning: Pesticides that are oxidizers, such as calcium hypochlorite (a common sanitizer) and some herbicides and desiccants that contain chlorites, should not be contained with sawdust, shredded paper, or sweeping compounds. These absorbent compounds combine with the oxidizer to create a fire hazard and could burst into flame.

Clean Up

After you have contained the spill, you must pick up the spilled material and decontaminate the

spill site and any contaminated items or equipment.

Clean up the spill

For spilled liquid pesticides, sweep up the absorbent material containing the pesticide and place it into a heavy-duty plastic drum or bag. Keep adding the absorbent material until the spilled liquid is soaked up and removed.

Spills of dry pesticides should be swept up for reuse if possible. Avoid contaminating the spilled materials with soil or other debris, so it can be used in the usual application equipment and will not clog the nozzles or hopper openings. However, if the dry spill has become wet or full of debris, it must be swept up and placed in a heavy-duty plastic drum or bag for disposal.

Decontaminate the spill site

Once you have collected as much of the spilled material as possible, decontaminate the spill site as well as you can. **Do not hose down the site with water**, unless the spill is on a containment tray or pad.

If the surface on which the pesticide has spilled is nonporous, such as sealed concrete, glazed ceramic tile, or no-wax sheet flooring, use water (or the chemical listed on the label to dilute the pesticide) and a strong detergent to remove the residues of the spill from the surface. Do not allow any of the wash solution to run off the site being cleaned. Place fresh absorbent material over the wash solution until it is all soaked up. Then sweep up the absorbent material and place it in a plastic drum or bag for disposal as an excess pesticide.

If the surface upon which the pesticide has spilled is porous, such as soil, unsealed wood, or

carpet, you may have to remove the contaminated surface and dispose of it as an excess pesticide. Depending on the size of the spill and the toxicity of the pesticide, however, sometimes the site can be successfully neutralized.

Neutralize the spill site

The labeling of a few pesticides will instruct you to neutralize a spill of that pesticide. Sometimes an authority, such as the pesticide manufacturer or Chemtrec, will also instruct you to neutralize the spill site. Follow the instructions carefully.

Neutralizing a spill often consists of mixing full-strength bleach with hydrated lime and working this mixture into the spill site with a coarse broom. Fresh absorbent material is then spread over the spill site to soak up the neutralizing liquid. This material is swept up and placed in a plastic drum or bag for disposal. You may be instructed to repeat the process several times to make sure that the site is thoroughly neutralized.

Soil is sometimes neutralized by removing and disposing of the top 2 to 3 inches and then neutralizing the remaining soil. You may be instructed to mix activated charcoal into the soil or to cover the spill site with 2 or more inches of lime and cover the lime with fresh topsoil.

Sometimes you may be instructed to cover minor spills with activated charcoal. The activated charcoal can adsorb or tie up enough pesticide to avoid adverse effects to plants and animals that contact the soil in the future. However, activated charcoal is not effective for large spills.

Decontaminate equipment

Clean any vehicles, equipment, and personal protective equipment that were contaminated by the spill or during the containment and cleanup process. Use a strong mixture of chlorine bleach, dishwasher detergent, and water to clean the vehicles and equipment. Wash personal protective equipment thoroughly, following manufacturers' instructions and the guidelines in the personal protective equipment unit of this manual. Remember particularly that porous materials, such as brooms, leather shoes, and clothing, cannot be cleaned effectively if they are thoroughly saturated with pesticide. They should be discarded.

Decontaminate yourself

As soon as you are finished with the spill and equipment cleanup, wash yourself thoroughly with detergent and water. Wash any part of your skin that might have been exposed, and always wash your face, neck, hands, and forearms.

Spill Followup

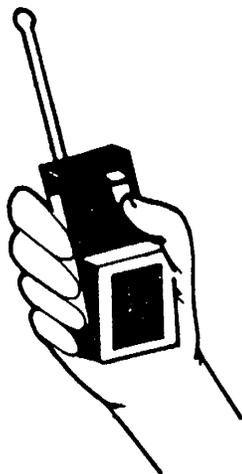
For all large spills, and any spills that take place off your property, consider keeping records of your containment and cleanup activities and your conversations with authorities and the public about the spill. Photographs help to document any damage as well as the cleanup process. Report the spill to the appropriate agency, when necessary.

Spill Assistance

Chemtrec, the Chemical Transportation Emergency Center, is a public service of the Chemical Manufacturing Association. Located in Washington, DC, Chemtrec is staffed 24 hours a day

by competent, trained personnel who are able to advise you how to manage chemical emergencies.

When you request help from Chemtrec or any other source, have the product label on hand.



Many pesticide labels list an emergency telephone number that gives you direct access to the manufacturer and people who know how to manage emergencies for that product.

If the spill occurs on a highway, call the highway patrol or highway department right away. If the spill occurs on a county road or city street, call the county sheriff, city police, or fire department. These authorities are trained for such emergencies and will be able to assist you in your cleanup. Many local and State authorities **require** that you notify them of a pesticide spill.

If you suspect that a large spill is flammable, call the fire department for assistance. However, do not let them hose down the spill unless an authority directs them to do so.

If the spill may expose the public to pesticides or pesticide residues, contact public health officials. If anyone is poisoned by contacting the spill or if you suspect that an exposure may lead to poisoning, call the hospital

emergency room and provide them with the brand name, active ingredients, and any other labeling information about human health hazards, signs and symptoms of poisoning, and antidotes.

Labeling Statements About Spill Management

Typical pesticide labeling instructions about spill procedures include:

If container is broken or contents have spilled, clean up immediately. Before cleaning up, put on full-length trousers, long-sleeved shirt, protective gloves, and goggles or face shield. Soak up spill with absorbent media such as sand, earth, or other suitable material and dispose of waste at an approved waste disposal facility.

If the container is leaking or material is spilled, carefully sweep material into a pile. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Keep unauthorized people away.

Contact the [chemical company] emergency response team for decontamination procedures or any other emergency assistance at [telephone number].

Spill Kit

Keep a spill cleanup kit immediately available whenever you handle pesticides or their containers. If a spill occurs, you will not have the time or the opportunity to find all of the items.

The kit should consist of:

- telephone numbers for emergency assistance,
- sturdy gloves, footwear, and apron that are chemical-resistant

to most pesticides, such as foil-laminate gear,

- protective eyewear,
- an appropriate respirator, if any of the pesticides require the use of one during handling activities or for spill cleanup,
- containment “snakes” to confine the leak or spill to a small area,
- absorbent materials, such as spill pillows, absorbent clay, sawdust, pet litter, activated

charcoal, vermiculite, or paper to soak up liquid spills,

- sweeping compound to keep dry spills from drifting or wafting during cleanup,
- a shovel, broom, and dustpan (foldable brooms and shovels are handy, because they can be carried easily),
- heavy-duty detergent,
- a fire extinguisher rated for all types of fires,

- any other spill cleanup items specified on the labeling of any products you use regularly, and
- a sturdy plastic container that will hold the quantity of pesticide from the largest pesticide container being handled and that can be tightly closed.

All of these items can be stored in the plastic container and kept clean and in working order until a spill occurs.



Q. What precautions should you take when you transport pesticides in a vehicle?

A.

1. Never carry pesticides in the passenger section.
2. Never allow children, other passengers, and pets to ride with pesticides.
3. Never transport pesticides with food, clothing, or other things meant to be eaten or in contact with people or animals.
4. Never leave your vehicle unattended when transporting pesticides in an unlocked trunk compartment or open-bed truck.
5. Consider transporting highly volatile pesticides in separate trips from other chemicals.

Q. What steps should you take to protect pesticide containers during transport?

A.

1. Transport containers with intact, undamaged, and readable labels.
2. Inspect containers to be sure that all openings are tightly closed

and that there are no pesticides on the outside of the containers.

3. Handle containers carefully.
4. Anchor all containers securely.
5. Protect paper and cardboard containers from moisture.
6. Protect pesticides from extreme temperatures.

Q. List four actions that you should take to establish a safe storage site.

A. Keep unauthorized people out; prevent water damage; control the temperature; provide adequate lighting; use nonporous materials; prevent runoff; provide clean water.

Q. List four actions that you should take to maintain a safe storage site.

A. Prevent contamination: keep labels legible; keep containers closed; use original containers; watch for damage; store volatile products separately; isolate waste products; know your inventory; consider shelf life.

Q. When a pesticide container is damaged, what actions can you take?

A.

1. Use the pesticide immediately at a site and rate allowed by the labeling.
2. Transfer the pesticide into another pesticide container that originally held the same pesticide and has the same label still intact.
3. Transfer the contents to a sturdy container that can be tightly closed and fasten the label to the outside of the new container.
4. Place the entire damaged container and its contents into a suitable larger container.

Q. If you have excess pesticide materials that are still usable, what can you do with them?

A. Apply them to a site listed on the labeling; find someone else who can legally use them; return them to the dealer, formulator, or manufacturer.

Q. If you have pesticide wastes (other than empty containers) what can you do with them?

A. Dispose in a hazardous waste landfill or pesticide incinerator, or store until disposal is possible.

Q. List three ways to avoid the need for disposing of empty pesticide containers as wastes.

A. Use refillable containers; recycle or recondition the containers; use soluble packaging.

Q. What do the three C's of spill management stand for?

A. Control, Contain, Clean up.

Q. What should you do to control a spill situation?

A. Protect yourself; stop the source of the spill; protect others; stay at the site.

Q. How should you contain a spill?

A. Confine the spill; protect water sources; absorb liquids; cover dry materials.

Q. What should cleanup include?

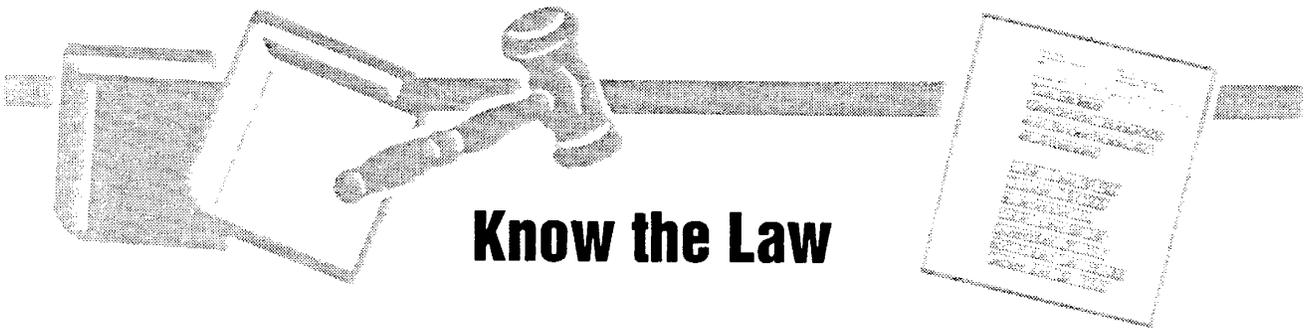
A. Clean up the spill; decontaminate the spill site; neutralize the spill site, if necessary; decontaminate equipment; decontaminate yourself.

Q. Who can you call when you need help to manage a spill?

A. Chemtrec; emergency numbers on pesticide labeling; police department or highway patrol; fire department; public health department.

Q. When should you have a spill kit on hand?

A. Every time a pesticide or pesticide container is handled.



Know the Law

If you are involved in a pesticide spill, you may need to comply with the provisions of two laws administered by the U.S. Environmental Protection Agency (EPA).

Title III of the Superfund Amendments and Reauthorization Act of 1986 (**SARA Title III**) requires you to report any accidental release (such as a spill) of any extremely hazardous substance. Reporting is required if all the following occur:

- The pesticide was spilled.
- The pesticide is covered under SARA Title III.
- The spill quantity was greater than the "reportable quantity" specified in the law.
- The spill created offsite exposure.

If such an accident occurs, you must:

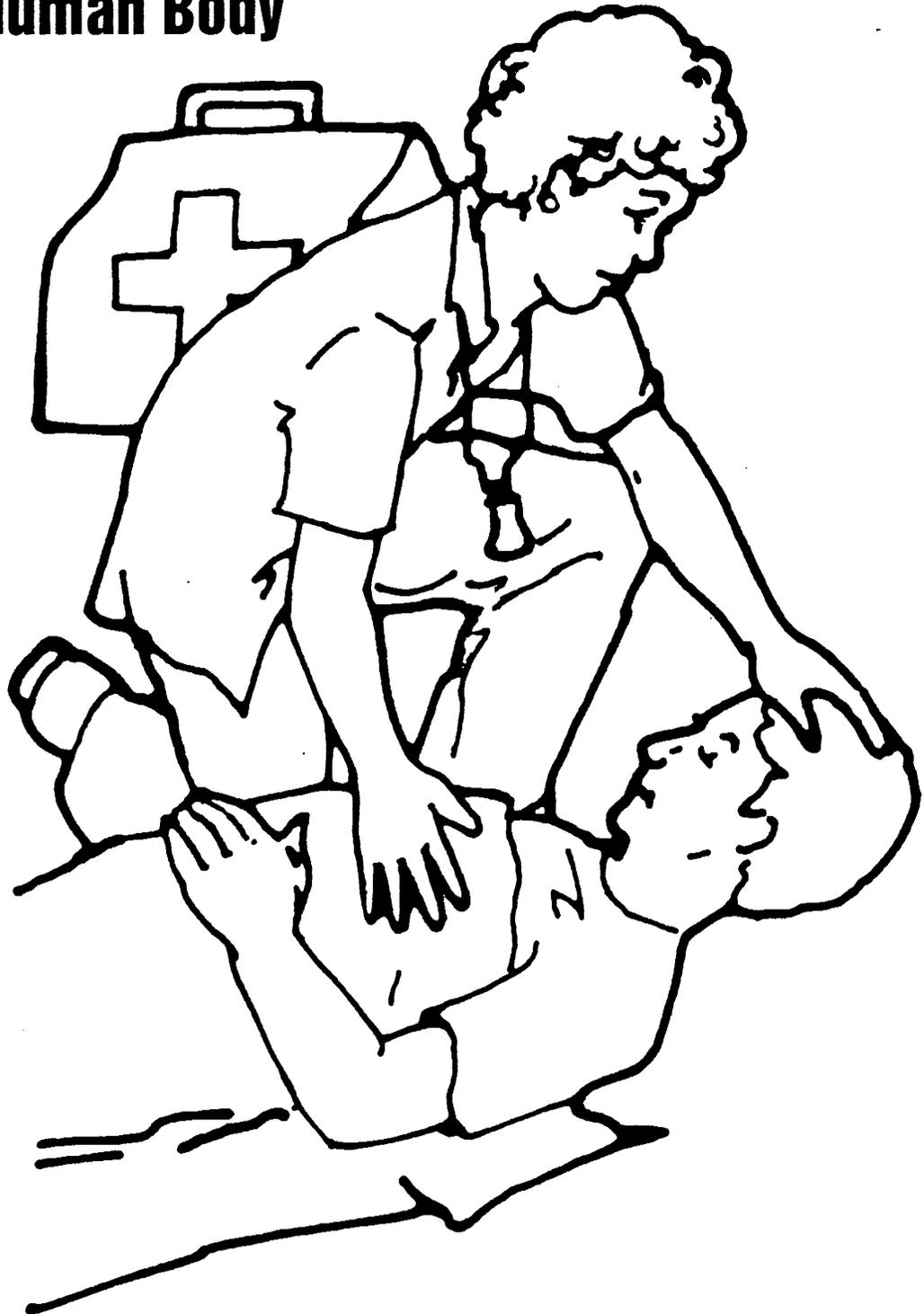
- Notify the State Emergency Response Commission (SERC).
- Notify the Local Emergency Planning Committee (LEPC).
- Report the release to the National Response Center (1-800-424-8802).

In addition, any spill that has the potential to get into ground water or surface water must be reported to EPA under the authority of the **Clean Water Act**.

If you do not know whether the spill is large enough to be a "reportable quantity" under SARA Title III or whether the spill might get into ground water or surface water, call your local or State, or tribal pesticide agency or the EPA regional office for help.

Appendix

Effects of Pesticides on the Human Body



Appendix

Effects of Pesticides on the Human Body

Chemical Family	Action on Human System	Acute Systemic Effects
1. Organophosphates	Inhibits acetylcholinesterase enzyme in tissues.	Headache, dizziness, weakness, shaking, nausea, stomach cramps, diarrhea, sweating.
2. N-Methyl Carbamates	Reversible changes in acetylcholinesterase enzyme in tissues.	Headache, dizziness, weakness, shaking, nausea, stomach cramps, diarrhea, sweating.
3. Organochlorines (Chlorinated Hydrocarbons)	Disrupt function of nervous system, mainly the brain.	Headache, dizziness, weakness, shaking, nausea, excitability, disorientation.
4. Pyrethrum and Pyrethrins	Allergen	Slight toxic reaction.
5. Nicotine	Harms nervous system.	Nausea, headache, diarrhea, dizziness, shaking, abdominal pain, lack of coordination, sweating, salivation.
6. Rotenone	Irritant	Minimal
7. <i>Bacillus thuringiensis</i>	None known	—
8. Gibberellic Acid	None known	—
9. Pyrethroids	Irritant	Minimal
10. Fluorides	Harms brain and stomach.	Thirst, abdominal pain, vomiting, diarrhea, headache, weakness, salivation, dilated pupils, lethargy.
11. Boric Acid	Irritants: Harms stomach, intestines, blood system, and brain.	Nausea, vomiting, abdominal pain, diarrhea, blood in vomit and feces, headache, weakness, tremors, restlessness.
12. Chlordimeform	Harms bladder; Sometimes harms skin.	Blood in urine, frequent and painful urination, abdominal and back pain, hot sensation, sleepiness.

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Minimal rashes, but readily absorbed through the skin.	Loss of appetite, weakness, weight loss, and general feeling of sickness, Occasionally permanent harm to brain and nerve system.	Insecticides, Acaricides
Minimal rashes, but readily absorbed through the skin.	Loss of appetite, weakness, weight loss, and general feeling of sickness.	Insecticides, Acaricides
Minimal rashes, but readily absorbed through the skin.	Some buildup in the fat tissues. May cause nervousness, weakness, and shaking. Some buildup in glands and damage cells and hormone production.	Insecticides, Acaricides
Minimal	Skin and respiratory tract allergic effects.	Insecticides, acaricides
Minimal, but readily absorbed through the skin.	—	Insecticides
Irritates skin, eyes, and respiratory tract.	—	Insecticides, acaricides
—	—	Insecticide
—	—	Growth regulator
Stinging, burning, itching, tingling, numbness of skin.	—	Insecticides
—	—	Insecticides
Irritates and burns skin and respiratory tract.	—	Insecticide
Skin rash, sweet taste.	—	Insecticide, miticides

Chemical Family	Action on Human System	Acute Systemic Effects
13. Propargite	Irritants: Low systemic toxicity.	Minimal
14. Diflubenzuron, Teflubenzuron	Low systemic toxicity.	Minimal
15. Chlorobenzilate	Irritants: Low systemic toxicity.	Minimal
16. Cyhexatin	Irritants; Probable harm to nervous system.	Probable headache, nausea, vomiting, dizziness, avoidance of light.
17. Methoprene	Very low systemic toxicity.	Minimal
18. Sulfur	Irritant: Low systemic toxicity.	Minimal
19. Diethyltoluamide	Irritants: Low systemic toxicity, except to children.	Headache, restlessness, crying spells, stupor, tremors.
20. Alkyl Phthalates	Irritants: Low systemic toxicity.	Stomach- and intestine-lining irritation.
21. Benzyl Benzoate	Irritants: Low systemic toxicity.	Minimal
22. Arsenicals	Irritants: Harms liver, kidney, brain, bone marrow, and nervous system.	Headache, burning stomach pain, vomiting, diarrhea, dizziness; garlic odor on breath and feces.
23. Chlorophenoxy Compounds	Irritants: Harms liver, kidney, and nervous system; May cause skin to discolor.	Do not remain in body; passed out within hours or days.
24. Nitrophenolic and Nitrocresolic Pesticides	Harms liver, kidneys, and nervous system.	Headache, weakness, thirst, excessive sweating, feeling of overall illness; Yellow stain on skin, hair, and urine is characteristic.
25. Pentachlorophenol	Irritants: Harms liver, kidneys, and nervous system.	Headache, weakness, nausea, excessive sweating, dizziness, fever, rapid breathing, intense thirst, vomiting, restlessness.

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Severe skin and eye irritant.	Probable skin sensitizer.	Acaricide
—	—	Insecticide
Skin and eye irritant.	Tumors observed in laboratory animals.	Acaricide
Mild skin irritant.	—	Acaricide
—	—	Insecticide
Irritates eyes, skin, and respiratory tract.	—	Acaricide; Fungicide
Very irritating to eyes, mild skin irritation and peeling, except severe skin irritation in tropical conditions.	—	Insect repellent
Severely irritating to eyes and mucous membranes, not irritating to skin.	—	Insect repellent
Occasionally irritating to skin.	—	Acaricide
Swelling of mouth and throat, irritating to eyes, nose, and throat.	Accumulates in body; Chronic headaches, dizziness, stomach aches, salivation, low fever, garlic breath; Skin, liver, kidney, and blood system disorders; Possible skin and lung cancer.	Rodenticides, Insecticides, Acaricides, Marine antifouling compounds, Desiccants, Herbicides, Fungicides
Irritating to eyes, skin, lungs, mucous membranes.	Severe disfiguring skin condition (chloracne) in manufacturing workers.	Fungicides
Moderately irritating sensations to skin, eyes, nose, and throat.	Weight loss, cataracts, glaucoma.	Herbicides
Highly irritating to skin, eyes, nose, and throat.	Weight loss, weakness, anemia. Severe disfiguring skin disorder in manufacturing workers.	Herbicides, Defoliants, Molluscicides, Germicides, Fungicides, and Wood preservatives.

Chemical Family	Action on Human System	Acute Systemic Effects
26. Paraquat and Diquat	Irritants: Harms skin, nails, cornea, liver, kidney, linings of stomach and intestine, and heart. Severe delayed harm to lungs.	Burning pain in mouth, throat, stomach, and intestine, nausea, vomiting, diarrhea, giddiness, fever.
27. Acetamides	Irritants	Minimal
28. Anilides	Irritants	Minimal
29. Aliphatic Acids	Irritants	Minimal
30. Benzamide	Irritants; Low systemic toxicity.	Minimal
31. Benzoic Acid and Anisic Acid Derivatives	Irritants	Minimal
32. Benzonitriles	Irritants	Minimal
33. Benzothiadiazinone Dioxide	Irritants	Minimal
34. Dithio and Thio Carbamates	Irritants; Very weak or no inhibition of cholinesterase enzyme in tissues.	Nausea, vomiting, diarrhea, weakness.
35. Carbanilate	Irritants; Very weak or no inhibition of cholinesterase enzyme in tissues.	Minimal
36. Chloropyridinyl	Irritants	Minimal
37. Cyclohexenone Derivative	Irritants	Minimal
38. Dinitronaminobenzene Derivatives	Irritants	Minimal
39. Fluorodinitrotoluidine Compounds	Irritants	Minimal
40. Isoxazolidinone	Irritants	Minimal
41. Nicotinic Acid Isopropylamine Derivative	Irritants	Minimal
42. Oxadiazolinone	Low systemic toxicity.	—
43. Phosphonates	Irritants	Minimal
44. Phthalates (except endothall)	Irritants	Minimal

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Irritates and harms skin, nails, nose, and eyes.	—	Herbicides
Moderately irritating to skin and eyes.	—	Herbicides
Irritates skin, eyes, and respiratory tract.	Skin sensitizers.	Herbicides
Irritates skin, eyes, and respiratory tract.	—	Herbicides
Occasionally irritating to skin.	—	Herbicide
Irritating to skin and respiratory tract.	—	Herbicides
Moderately irritating to skin and respiratory tract.	Skin sensitizers.	Herbicides, Fungicides
Irritates eyes and respiratory tract.	—	Herbicide
Irritates skin, eyes, mucous membranes, and respiratory tract.	Skin sensitizers.	Herbicides, Fungicides
Irritates skin, eyes, mucous membranes, and respiratory tract.	Skin sensitizers.	Herbicides
Irritates skin and eyes.	—	Herbicides
Irritant	—	Herbicides
Moderately irritating.	—	Herbicides
Mildly irritating.	—	Herbicides
Moderately irritating.	—	Herbicides
Irritating to eyes and skin.	—	Herbicides
—	—	Herbicides
Irritating to eyes, skin, and respiratory tract.	—	Herbicides
Moderately irritating to eyes	—	Herbicides

Chemical Family	Action on Human System	Acute Systemic Effects
45. Endothall	Harms heart, blood vessels, nervous system, and stomach and intestinal lining.	Convulsions, shock, lack of coordination, severe burning of stomach and intestine.
46. Picolinic Acid Compounds	Irritants	Minimal
47. Triazines	Irritants; Low systemic toxicity.	Minimal
48. Triazole	Minimal	Minimal
49. Uracils	Irritants	Minimal
50. Urea derivatives	Irritants	Minimal
51. Thiophthalimides	Irritants; Low systemic toxicity	Minimal
52. Copper	Irritants; Harms stomach and intestinal lining, brain, liver, kidneys, and blood system.	Prompt vomiting, burning pain in chest, diarrhea, headache, sweating.
53. Organomercuric Compounds	Harms nervous system and kidneys.	Delirium, muscle weakness, lack of coordination, numbness in fingers and face, slurred speech, hearing loss.
54. Organotin	Irritants; Harms brain, stomach, and intestines.	Headache, vomiting, dizziness, convulsions, stomach pain.
55. Cadmium	Irritants; Harms lungs, kidney, blood system, liver, stomach and intestinal lining.	Headache, cough, labored breathing, chest pain, nausea, vomiting, diarrhea, abdominal pain.
56. Anilazine	Irritants; Low systemic toxicity.	Minimal
57. Cycloheximide	Low systemic toxicity.	—
58. Dodine	Irritants; Low systemic toxicity.	Nausea, vomiting, diarrhea, harm to stomach and intestinal lining.
59. Iprodione, Metalaxyl, Terrazole, Thiabendazole, Triadimefon, Triforine	Slight Irritants; Low systemic toxicity.	Minimal
60. Coumarins, Indandiones, and Other Anticoagulants	Prevents blood from clotting.	Minimal, blood in urine.

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Irritating to eyes, skin, and mucous membranes.	—	Herbicides, Algicides
Irritating to skin, eyes, and respiratory tract.	—	Herbicides
Moderately irritating to skin, eyes, and respiratory tract.	—	Herbicides
Slight irritant effect.	—	Herbicide
Irritate skin, eyes, and respiratory tract.	—	Herbicides
Irritate eyes, skin, and mucous membranes.	—	Herbicides
Irritates skin, eyes, and respiratory tract.	Skin sensitizers.	Fungicides
Irritates skin, respiratory tract, and particularly the eyes. Corrosive to eyes.	—	Fungicides
Minimal	Weakness and lack of coordination in arms and legs; difficulty talking and swallowing; permanent nerve and brain damage.	Fungicides
Irritates eyes, skin, and respiratory tract.	—	Fungicides, Antifouling paints
Very irritating to respiratory tract.	Harm to kidneys, liver, blood system, bone structure.	Fungicides
Irritates skin.	—	Fungicides
—	—	Fungicides
Irritates skin and eyes.	—	Fungicides
Slightly irritating to eyes and skin.	—	Fungicides
Bleeding gums and nose.	—	Rodenticides

Chemical Family	Action on Human System	Acute Systemic Effects
61. Yellow Phosphorous	Corrosive; Highly toxic; Harms heart, blood system, liver, brain, and kidneys.	Breath has garlic odor; Feces may glow and smoke; Vomiting, diarrhea, lethargy, restlessness, irritability, burning pain in throat, stomach, and intestines.
62. Zinc Phosphide	Highly toxic; Harms liver, kidneys, nervous system, heart; Severe respiratory and intestinal irritation.	Intense nausea, stomach pain, excitement, chills, cough.
63. Thallium sulfate	Harms nervous system, lungs, heart, blood vessels, kidney, liver, and lining of stomach and intestines.	Stomach pain, nausea, diarrhea, salivation, headache, lethargy, tremors, muscle weakness.
64. Sodium Fluoroacetate	Extremely toxic. Harms heart and brain.	Stomach pain, vomiting, hallucination, nervousness.
65. Strychnine and Crimidine	Acts directly on cells in the brain and spinal cord.	Blue skin color, violent convulsions.
66. ANTU and Norbormide	Low systemic toxicity, except in huge doses.	—
67. Red Squill	Low systemic toxicity.	Prompt vomiting and nausea.
68. Pyriminil	Very toxic; Harms nervous system, brain, and area around the heart.	Nausea, vomiting, diarrhea, stomach cramps, chills, confusion, weakness, chest pains.
69. Cholecalciferol	Harms liver, kidney, and heart tissue.	Weakness, headache, nausea, excess thirst and urine.
70. Napthalene	Irritants; Harms kidneys and blood system.	Headache, dizziness, nausea, vomiting.
71. Methylene Chloride	Harms stomach, intestines, liver, and kidney.	Fatigue, weakness.
72. Methyl Bromide	Irritants; Serious harm to lungs; Harms nervous system.	Coughing of frothy fluid; Severe shortness of breath, drowsiness, shaking, weakness.
73. Chloroform, Carbon Tetrachloride, Ethylene Dichloride	Irritants; Harms liver and kidneys.	Dizziness, loss of sensation and motor power, unconsciousness.
74. Ethylene dibromide	Severe irritants; Harms lungs, liver, kidney, and lining of stomach and intestine.	Dizziness, headache, fatigue, cough, abdominal pain.
75. Dibromochloropropane	Severe irritant; Harms liver and kidney.	Headache, nausea, vomiting, slurred speech, confusion.

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Corrosive to skin, eyes, and mucous membranes.	—	Rodenticides
Irritates skin and mucous membranes; very irritating to respiratory tract.	—	Rodenticides
Minimal	Confusion, damage to nervous system, partial paralysis, damage to sight.	Rodenticides
Minimal	—	Rodenticides
Minimal	—	Rodenticides
—	—	Rodenticides
—	—	Rodenticides
Minimal	—	Rodenticides
—	—	Rodenticides
Irritates eyes and respiratory tract.	Skin sensitizer	Rodenticides
—	—	Fumigants
Severe burns, itching and blisters on skin.	Lack of coordination, muscle weakness, confusion.	Fumigants
Irritates respiratory tract.	—	Fumigants
Severely irritates respiratory tract. Corrosive to eyes and skin.	Damage to male reproductive organs.	Fumigants
Irritating to skin, eyes, and respiratory tract.	Sterility, eye damage.	Fumigants

Chemical Family	Action on Human System	Acute Systemic Effects
76. Dichloropropene, Dichloropropane	Strong irritants; Harms liver, kidney and heart tissue.	Breathing spasms.
77. Paradichlorobenzene	Irritants; Low systemic toxicity.	Minimal
78. Ethylene Oxide, Propylene Oxide	Irritants; Harms lungs and heart.	Headache, nausea, vomiting, weakness, cough of frothy, bloody fluid.
79. Formaldehyde, Paraformaldehyde	Irritants; Harms kidney, blood systems and lining of stomach and intestine.	Asthma, abdominal pain.
80. Acrolein	Irritants; Harms lungs, kidneys, blood system and lining of stomach and intestine.	Asthma, abdominal pain.
81. Sulfur Dioxide	Strong irritant to lungs and throat.	Respiratory distress.
82. Chloropicrin	Irritants	Vomiting, abdominal pain.
83. Sulfuryl Fluoride	Harms lungs and kidneys.	Weakness, nausea, vomiting, cough, muscle twitching, convulsions.
84. Carbon Disulfide	Irritants; Harms nervous system; Delayed harm to kidney and liver.	Dizziness, headache, nausea, and disorientation.
85. Phosphine	Irritants; Harms lungs, liver, kidneys, heart, and nervous system.	Nausea, vomiting, dizziness, weakness, shaking, cough, difficulty in breathing, intense thirst.
86. Hydrogen Cyanide, Acrylonitrile	Irritants; Harms brain and heart tissues.	Headache, nausea, constriction of throat, dizziness, nervousness, sudden unconsciousness.
87. Metaldehyde	Harms stomach lining, kidney, liver.	Salivation, cramps, vomiting, tremors.
88. Aminopyridine	Disrupts nervous system functions.	Thirst, nausea, dizziness, weakness, excessive sweating.
89. Calcium Cyanamide	Irritants	Flushing, headache, low blood pressure, difficulty breathing.
90. Sodium Chlorate	Irritants; Harms intestinal lining, nervous system, and kidneys.	Swelling of mouth and throat, pain in esophagus, stomach and intestine, restlessness, nausea, vomiting, diarrhea.

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Severely irritate skin, eyes, and respiratory tract.	—	Fumigants
Mildly irritating to nose and eyes.	—	Fumigants
Blistering and erosion to skin.	Skin sensitizer.	Fumigants
Irritating to eyes and respiratory tract; hardens and roughens skin.	Systemic sensitizer	Fumigants
Severe eye and respiratory tract irritant; Blisters on skin.	—	Fumigants, Herbicides
Severely irritating to eyes and respiratory tract.	—	Fumigants
Severely irritating to eyes, skin, and respiratory tract.	—	Fumigants
Irritating to eyes, nose, and throat.	Harm to lungs and kidneys.	Fumigants
Irritates eyes, nose, and throat.	Painful tingling and weakness in arms and legs; loss of mental functions; blindness, deafness, paralysis.	Fumigants
Mildly irritating to respiratory tract.	—	Fumigants
—	—	Fumigants, Rodenticides
—	—	Molluscicides
—	—	Avicides
Irritates skin: May be caustic to skin and severely irritating to mucous membranes.	—	Fungicides and Herbicides
Irritates skin, eyes, and respiratory tract.	—	Herbicides, Defoliants

Chemical Family	Action on Human System	Acute Systemic Effects
91. Creosote	Irritants: Harms brain tissue, lining of stomach and intestine.	Salivation, vomiting, abdominal pain, headache, dizziness, chills, convulsions.
92. Hexachlorobenzene	Irritants; Low systemic toxicity; chronic systemic effects.	—
93. Pentachloronitrobenzene	Minimal	—
94. Dichloran	Minimal	—
95. Chlorothalonil	Irritants	—
96. Chloroneb	Irritants	—
97. Benomyl	Low systemic toxicity.	—

Irritation Effects	Delayed/Allergic Effects	Type of Pesticide
Severely irritates skin, eyes, and mucous membranes.	Skin irritation, skin discoloration: Rarely gangrene and skin cancer.	Wood preservatives, Insecticides, Disinfectants
Minimal	Injures liver and blood system.	Fungicides
—	Possible skin sensitizers	Fungicides
—	—	Fungicides
Irritates eyes, mucous membranes, and respiratory tract.	Skin sensitizer, rarely.	Fungicides
Moderately irritating to skin and mucous membranes.	—	Fungicides
—	Skin sensitizer.	Fungicides

Index for Pesticide Effects Chart

The number following each pesticide on the list below refers to the number corresponding to the pesticide family on the EFFECTS OF PESTICIDES ON THE HUMAN BODY chart.

- 1080, 60
 2,3,6—TBA, 31
 2,4,5 trichlorophenoxyacetic acid, 23
 2,4,5-T, 23
 2,4-D, 23
 2,4-DB, 23
 2,4-dichlorophenoxyacetic acid, 23
 2,4-dichlorophenoxybutyric acid, 23
 2,4-dichlorophenoxypropionic acid, 23
 2,4-DP, 23
 2-methyl-3,6 dichlorobenzoic acid, 23
 2-methyl-4-chlorophenoxy aliphatic acids and esters, 23
 4-Aminopyridine, 88
 4-AP, 88
 A7 Vapam, 34
 AASTAR, 1, 9
 AAtack, 34
 Aaterra, 59
 AAtrex, 47
 Abate, 1
 Abathion, 1
 Abol, 2
 Acaraben, 15
 Accelerate, 45
 Accotab, 38
 Accothion, 1
 acephate, 1
 acetamides, 27
 Acme amine, 23
 Acme Butyl Ester, 23
 Acme LV, 23
 Acrex, 24
 Acricid, 24
 Acritet, 86
 acrolein, 80
 acrylaldehyde, 80
 Acrylofume, 86
 acrylonitrile, 86
 Actellie, 1
 Acti-dione, 57
 Actispray, 57
 Activol, 8
 Actor, 26
 Afalon, 50
 Afesin, 50
 Aficida, 2
 Afugan, 1
 Agritox, 1
 Agrosan, 53
 Agrotect, 23
 Agrothion, 1
 Agroxone, 23
 Akar, 15
 Akzo Chemie Mancozeb, 34
 Akzo Chemic Maneb, 34
 alachlor, 28
 Alanox, 28
 aldicarb, 2
 aldrin, 3
 Aldrite, 3
 aliphatic acids, 29
 alkyl phthalates, 20
 Allethrin, 9
 allidochlor, 27
 Allisan, 94
 Alon, 50
 AIP, 85
 alpha-naphthyl thiourea, 60
 alphametrin, 9
 Altosid, 17
 aluminum phosphide, 85
 Amaze, 1
 Ambox, 24
 Ambush, 9
 Amerol, 48
 Ametrex, 47
 ametryn, 47
 Amex, 38
 amiben, 31
 Amine 2,4,5-T, 23
 aminocarb, 2
 4-aminopyridine, 88
 amino-triazole, 48
 Amiral, 59
 Amitrol-t, 48
 amitrole, 48
 Ammo, 9
 Amoxone, 23
 anilazine, 56
 anilides, 28
 anisic acid derivatives, 31
 Ansar, 22
 Anthio, 1
 Anticarie, 92
 Antimilace, 87
 ANTU, 60
 4-AP, 88
 Apachlor, 1
 Apex, 17
 Aphox, 2
 Apl-Luster, 59
 Appex, 1
 aprocarb, 2
 Apron, 59
 Aquacide, 26
 Aqua-Kleen, 23
 Aqualin, 80
 Aquathol, 45
 Aquatin, 54
 Aquazine, 47
 Aquinite, 82
 Arbotect, 59
 Arelin, 50
 Arrhenal, 22
 Arsenal, 41
 arsenic acid, 22
 arsenic pesticides, 22
 arsenic trioxide, 22
 arsenous oxide, 22
 Arsine, 22
 Arsinyl, 22
 Arsonate Liquid, 22
 Asana, 9
 Aspon, 1
 Aspor, 34
 asulam, 34
 Asulox, 34
 Asuntol, 1
 AT-90, 48
 Atranex, 47
 Atratol, 90
 atraton, 47
 Atratone, 47
 atrazine, 47
 Aules, 34
 Avadex, 34
 Avicol, 93
 Avitrol, 88
 Azac, 34
 Azar, 34
 azinphos methyl, 1
 Azodrin, 1
 Azolan, 48
 Azole, 48
 bacillus thuringiensis, 7
 Bactimos, 7
 Bactospeine, 7
 Bactur, 7
 Balan, 39
 Balfin, 39
 Ban-Hoe, 49
 Banvel, 23, 31
 barban, 35
 Barricade, 9
 Barrier, 32
 barthrin, 9
 Basagran, 33
 Basalin, 39
 Basanite, 24
 Basfapon, 29
 BASF-Maneb Spritzpulver, 34
 Bash, 1
 Batasan, 54
 Baygon, 2
 Bayleton, 59
 Bayrusil, 1
 Baytex, 1
 Baythion, 1
 Baythroid, 9
 Beet-Kleen, 35
 Belgran, 50
 Belmark, 9
 bendiocarb, 2
 Benefin, 39
 Benex, 97
 benfluralin, 39
 Benlate, 97
 benomyl, 97
 bensulide, 1
 bentazon, 33
 Benzac, 31
 benzamide, 30
 Benzilan, 15
 Benzofuroline, 9
 benzoic, anisic acid derivatives, 31
 benzonitriles, 32
 benzothiadiazinone dioxide, 33
 Benzyl Benzoate, 21
 Berelex, 8
 Bermat, 12
 Betasan, 1
 Bexton, 28
 BH 2,4-D, 23
 BH 2,4-DP, 23
 BHC, 3
 Bicep, 27
 Bidrin, 1
 binapacryl, 24
 biopermethrin, 9
 bioresmethrin, 9
 Birlane, 1
 Black Leaf 40, 5
 Bladafum, 1
 Bladex, 47

Bo-Ana. 1
 Bolate. 22
 Bolero. 34
 Bolts-Eye. 22
 Bolstar. 1
 bomyl. 1
 Bophy. 22
 borates. 11
 borax. 11
 Bordeaux Mixture. 52
 Borea. 49
 Boric acid. 11
 boron trioxide. 11
 Botran. 94
 Botrilex. 93
 Bravo. 95
 Brestan. 54
 Brimstone. 18
 Brodan. 1
 brodifacoum. 60
 bromacil. 49
 bromadiolone. 60
 Bromax. 49
 Bromofume. 72
 Brom-O-Gas. 72
 Brom-O-Gaz. 72
 bromomethane. 72
 Bromone. 60
 bromophos. 1
 bromophos-ethyl. 1
 Brom-O-Sol. 72
 Broot. 2
 Bud-Nip. 35
 Bueno. 22
 bufencarb. 2
 Bug-Geta. 87
 Busan. 35
 Butoxon. 23
 Butoxone. 23
 butralin. 38
 butylate. 34
 Butyrac. 23
 Bux. 2
 BW-21-Z. 9
 cacodylic acid. 22
 Caddy. 55
 Cadminate. 55
 cadmium chloride. 55
 cadmium pesticides. 55
 cadmium sebacate. 55
 cadmium succinate. 55
 cadmium sulfate. 55
 Cad-Trete. 34. 55
 Caid. 60
 Calar. 22
 calcium acid methane
 arsonate. 22
 calcium arsenate. 22
 calcium arsenite. 22
 calcium cyanamide. 89
 Caldron. 24
 Caliber. 47
 CAMA. 22
 Canadien. 60
 Can-Trol. 23
 Caparol. 47
 Captaf. 51
 Captofol. 51
 captan. 51
 Captanex. 51
 Carbacryl. 86
 Carbamult. 2
 carbanilates. 35
 carbaryl. 2
 Carbazinc. 34
 carbofuran. 2
 carbon disulfide. 84
 carbon tetrachloride. 73
 carbophenothion. 1
 Carbyne. 35
 Carpene. 97
 Carzol. 2
 Casoron. 32
 Castrix. 60
 CCN52. 9
 CDAA. 27
 Cekiuron. 50
 Ceku CB. 92
 Ckeugib. 8
 Cekumeta. 87
 Ckeuquat. 26
 Cekusan. 47
 Cekusi. 53
 Cela W-524. 59
 Celathion. 1
 Celfume. 73
 Celmer. 53
 Celmide. 74
 Ceresan. 53
 Certan. 7
 Chem Bam. 34
 Chem Fish. 6
 Chem Pels C. 22
 Chem Rice. 28
 Chem Zineb. 34
 Chemox General. 24
 Chemox PE. 24
 Chemsect DNBP. 24
 Chemsect DNOC. 24
 Chem-Sen. 56. 22
 Chipco Thiram. 34
 Chipco Turf Herbicide "D". 23
 chloramben. 31
 Chlordan. 3
 chlordane. 3
 chlordecone. 3
 chlordimeform. 12
 chlorfenvinphos. 1
 chlorimuron ethyl. 50
 chlormephos. 1
 chlorobenzilate. 15
 chloroform. 73
 Chloro-IPC. 35
 chloroneb. 96
 chlorophacinone. 60
 Chlorophen. 25
 chlorophenothane. 3
 Chlor-O-Pic. 82
 chloropicrin. 82
 chloropyridinyl. 36
 Chlorothalonil. 95
 chlorotoluron. 50
 Chloroxone. 23
 chloroxuron. 50
 chlorophoxim. 1
 chlorpropham. 35
 chlorpyrifos. 1
 chlorthal-dimethyl. 44
 chlorthiophos. 1
 cholecalciferol. 60. 69
 Chrysrion. 9
 cinerins. 4
 Ciodrin. 1
 cismethrin. 9
 Classic. 50
 Clifton Sulfur. 18
 cloethrcarb. 2
 ClortoCaffaro. 95
 Clortosip. 95
 Cobex. 39
 Codal. 27
 Comite. 13
 Command. 40
 Compound 1080. 64
 Contrac. 60
 Contraven. 1
 copper acetate. 52
 copper acetoarsenite. 22
 copper ammonium
 carbonate. 52
 copper arsenite. 22
 copper carbonate. 52
 copper hydroxide. 52
 Copper Lime dust. 52
 copper linoleate. 52
 copper naphthenate. 52
 copper oleate. 52
 copper oxychloride. 52
 copper phenyl salicylate. 52
 copper potassium sulfide. 52
 copper quinolinolate. 52
 copper resinate. 52
 copper silicate. 52
 copper sulfate. 52
 copper sulfate tribasic. 52
 Co-Ral. 1
 Co-Rax. 60
 Corozate. 34
 Corry's Slug and Snail
 Death. 87
 Cosan. 18
 Cotoran. 50
 Cottonex. 50
 coumachlor. 60
 coumafene. 60
 coumafuryl. 60
 coumaphos. 1
 coumarins. 60
 coumatetralyl. 60
 Counter. 1
 Cov-R-Tox. 60
 Crab-E-Rad. 22
 Crag Turf Fungicide 531. 55
 creosote. 91
 crimidine. 65
 Crisalamina. 23
 Crisamina. 23
 Crisazina. 47
 Crisfolatan. 51
 Crisfuran. 2
 Crisquat. 26
 Crisuron. 50
 Crop Rider. 23
 Crossbow. 36
 Crotothane. 24
 crotoxyphos. 1
 crufomate. 1
 cryolite. 10
 Cuman. 34
 cupric oxide. 52
 cuprous oxide. 52
 Curacron. 1
 Curamil. 1
 Curaterr. 2
 Curitan. 58
 cyanamide. 89
 cyanofenphos. 1
 cyanophos. 1
 Cyanox. 1
 cyclothrin. 9
 cycloate. 34
 cyclohexenone derivative. 37
 cycloheximide. 57
 Cyclon. 86
 Cyflee. 1
 cyfluthrin. 9
 Cygon. 1
 cyhexatin. 16
 Cylan. 1
 Cymbush. 9
 Cymperator. 9
 Cyolane. 1
 Cyperkill. 9
 cypermethrin. 9
 Cypona. 1
 Cyprex. 58
 Cyrux. 9
 cythioate. 1
 Cytrol. 48

Cytrolane. 1
 2,4-D. 23
 2,4-DB. 23
 D50. 23
 Dacamine. 23
 Daconate. 22
 Daconil 2787. 95
 Dacthal. 44
 Dailon. 50
 Danitol. 9
 Dapacryl. 24
 Dart. 14
 Dasanit. 1
 DBCP. 75
 DCNA. 94
 DCPA. 44
 D-D. 76
 DDD. 3
 DDT. 3
 DDVP. 1
 Debroussaillant 600. 23
 Decabane. 32
 decamethrin. 9
 Dechlorane. 3
 Desic. 9
 Ded-Weed. 23, 29
 Ded-Weed SULV. 23
 DEET. 19
 DEF. 1
 DeFend. 1
 De-Fol-Ate. 90
 Deflor. 50
 DeGreen 1
 Deiquat. 26
 Delnav. 1
 deltamethrin. 9
 demeton. 1
 demeton-S-methyl. 1
 Denarin. 59
 Dervan. 90
 Des-i-cate. 45
 Dessin. 24
 Detamide. 19.
 Dethdiet. 67
 Devizeb. 34
 Dextrone. 26
 Dexuron. 26
 Di-on. 50
 Di-Tac. 22
 Diacon. 17
 dialifor. 1
 diallate. 34
 Dianex. 22
 Diaract. 14
 Diater. 50
 diazinon. 1
 Dibrom. 1
 dibromochloropropane. 76
 dibromoethane. 74
 dibutylphthalate. 20
 Dicamba. 23, 31
 Dicarbam. 2
 dichlobenil. 32
 dichlofenthion. 1
 Dichloran. 94
 dichlorethane. 73
 2,4-dichlorophenoxyacetic acid. 23
 2,4-dichlorophenoxybutyric acid. 23
 2,4-dichlorophenoxypropionic acid. 23
 dichloropropane. 76
 dichloropropene. 76
 dichloropropane plus dichloropropene. 76
 dichloropropionic acid. 29
 dichlorvos. 1
 dicofol. 3
 dicrotophos. 1
 Dicuran. 50
 dieldrin. 3
 Dieldrite. 3
 dienochlor. 3
 diethyltoluamide. 19
 difenacoum. 60
 difenoxuron. 50
 Diflubenzuron. 14
 Difolatan. 51
 Dilic. 22
 Dimecron. 1
 dimefox. 1
 dimephenthoate. 1
 dimetan. 2
 Dimethan. 2
 dimethoate. 1
 dimethrin. 9
 dimethyl phthalate. 20
 Dimilin. 14
 dinitramine. 39
 Dinitro. 24
 Dinitro-amino-benzene derivatives. 38
 dinitrocresol. 24
 dinitrophenol. 34
 dinobuton. 24
 dinocap. 24
 Dinofen. 24
 dinopenton. 24
 dinoprop. 24
 dinosam. 24
 dinoseb. 24
 dinosulfon. 24
 dinoterb. 24
 dinoterbon. 24
 Dinoxol. 23
 Di-on. 50
 dioxacarb. 2
 dioxathion. 1
 Dipel. 7
 diphacin. 60
 diphacinone. 60
 Dipher. 34
 Dipterex. 1
 Dipyrityls. 26
 Diquat. 26
 Direx. 50
 Dirimal. 38
 disodium arsenate. 22
 disodium methane arsonate. 22
 disulfoton. 1
 Disyston. 1
 Di-tac. 22
 Dithane. 34
 Dithione. 1
 ditranil. 94
 Diurex. 50
 Diurol. 50
 diuron. 50
 DLP-87. 68
 DMA. 22
 DMA 4. 23
 DMP. 20
 DNAP. 24
 DNBP. 24
 DNC. 24
 DNOC. 24
 Dodine. 97
 Dojyopicrin. 82
 Dolochlor. 82
 Dormone. 23
 Dosaflo. 50
 Dosanex. 50
 Dotan. 1
 Dowpon. 29
 2,4-DP. 23
 DPA. 28
 DPX 1410. 2
 Drat. 60
 Drawinol. 24
 Draza. 2
 Drexar 530. 22
 Drexel Defol. 90
 Drinox. 3
 Drop-Leaf. 90
 Drupina 90. 34
 DSE. 34
 DSMA. 22
 Du-Ter. 54
 Dual. 27
 Duraphos. 1
 Duratox. 1
 Dursban. 1
 Duter. 54
 Dwell. 59
 Dycarb. 2
 Dyclomec. 32
 Dyfonate. 1
 Dylox. 1
 Dynamyte. 24
 Dyrene. 56
 E-48. 1
 E-601. 1
 E-605. 1
 Earthcide. 93
 Easy off-D. 1
 Ectiban. 9
 EDB. 74
 E-D-Bee. 74
 EDC. 73
 edifenphos. 1
 Ekamet. 1
 Ekatin. 1
 Eksmin. 9
 Elgetol. 24
 Elocron. 2
 Embutox. 23
 emerald green. 22
 Emisan. 53
 Emulsamine BK. 23
 Emulsamine E-3. 23
 Endosan. 24
 endosulfan. 3
 endothall. 45
 endothion. 1
 Endrin. 3
 Entex. 1
 Envert. 23
 EPBP. 1
 EPN. 1
 epoxyethane. 78
 Eptam. 34
 EPTC. 34
 Eradicane. 34
 Erazo. 60
 Erban. 28
 esfenvalerate. 9
 Esgram. 26
 Estone. 23
 ethalfluralin. 39
 Ethanox. 1
 Ethazol. 59
 ethion. 1
 ethoprop. 1
 ethyl parathion. 1
 ethylan. 3
 ethylene dibromide. 74
 ethylene dichloride. 73
 ethylene oxide. 78
 ETO. 78
 etrimfos. 1
 Etrofolan. 2
 Evik. 47
 Exotherm Termil. 95
 E-Z-Off D. 1
 Fac. 1
 Fall. 90
 Famfos. 1
 Famid. 2
 famphur. 1

Farmco, 23
 Ferberk, 34
 fenamiphos, 1
 fenclorophos, 1
 fenitrothion, 1
 Fenkill, 9
 fenophosphon, 1
 fenpropathrin, 9
 fensulfothion, 1
 fenthion, 1
 fentin acetate, 54
 fentin chloride, 54
 fentin hydroxide, 54
 fenvalerate, 9
 Ferbam, 34
 Fermide, 34
 Fernasan, 34
 Fernesta, 23
 Fernimine, 23
 Fernos, 2
 Fernoxone, 23
 Ferxone, 23
 Ficam, 2
 Final, 60
 Flectron, 9
 Florocid, 10
 fluchlorallin, 39
 flucythrinate, 9
 fluometuron, 50
 fluorides, 10
 fluorodinitrotoluidines, 39
 fluvalinate, 9
 FMC 9044, 24
 Folbex, 15
 Folcord, 9
 Folex, 1
 Foliafume, 6
 Folosan, 93
 Folpan, 51
 Folpet, 51
 Foltaf, 51
 fonofos, 1
 formaldehyde, 79
 formalin, 79
 formetanate, 2
 formothion, 1
 Formula 40, 23
 Forron, 23
 Fortrol, 47
 fosamine ammonium, 43
 fosthietan, 1
 Fratol, 64
 French Green, 22
 Fumarin, 60
 Fumitoxin, 85
 Fundal, 12
 Funginex, 59
 Fungitrol II, 51
 Fungostop, 34
 Furadan, 2
 furethrin, 9
 Furloe, 35
 furmarin, 60
 Futura, 7
 G 28029, 1
 GA, 8
 Galecron, 12
 Gallotox, 53
 gamma BHC, 3
 gamma HCH, 3
 Gardona, 1
 Gardoprim, 47
 Garlon, 36
 Gebutox, 24
 Gesafram 50, 47
 Gesagard, 47
 Gesamil, 47
 Gesapax, 47
 Gesatamin, 47
 Gesatop, 47
 gibberellic acid, 8
 Gibberellin, 8
 Gibrel, 8
 Glifonox, 43
 Glycophene, 59
 glyphosate, 43
 Go-Go-San, 38
 Golden Dew, 18
 Goldquat 276, 26
 Gordon's Amine, 23
 Gordon's Butyl Ester, 23
 Gordon's Dymec Turf
 Herbicide Amine 2,4-D, 23
 Gordon's LV 400 2,4-D, 23
 Gordon's Mecomec, 23
 Gordon's Phenaban 801, 23
 Graminon, 50
 Gramocil, 26
 Gramonol, 26
 Gramoxone, 26
 Gramuron, 26
 Granurex, 50
 Grasalan, 50
 Grazon, 46
 Griffex, 47
 Grocel, 8
 Gusathion, 1
 Guthion, 1
 Gypsine, 22
 Haipen, 51
 Haitin, 54
 Halizan, 87
 Hanane, 1
 Havoc, 60
 HCB, 92
 Hedonal, 23
 Hel-Fire, 24
 Helothion, 1
 heptachlor, 3
 Heptagran, 3
 heptenophos, 1
 Herald, 9
 Herb-All, 22
 Herbalt, 50
 Herbaxon, 26
 Herbicide 273, 45
 Herbidal, 23
 Herbizole, 48
 Herbodox, 38
 Herboxone, 26
 hexachlorobenzene, 92
 hexachlorocyclohexane, 3
 Hexadrin, 3
 Hexaferb, 34
 Hexathane, 34
 Hexathir, 34
 Hexazir, 34
 Hi-Yield Dessicant H-10, 22
 Hoe 002784, 24
 Hong Nien, 53
 Hostaquick, 1
 Hostathion, 1
 hydrocyanic acid, 86
 hydrogen cyanamide, 89
 hydrogen cyanide, 86
 Hydrothol, 45
 Hyvar, 49
 IBP, 1
 Igran, 47
 Imidan, 1
 indandiones, 60
 indothrin, 9
 Inverton 235, 23
 iodofenphos, 1
 IP50, 50
 Iprodione, 59
 isofenphos, 1
 isolan, 2
 isomethiozin, 47
 Isopestox, 1
 isoprocab, 2
 isopropalin, 38
 isoproturon, 50
 Isotox, 3
 isoxathion, 1
 Isoxazolidinone, 40
 jasmolins, 4
 Jones Ant Killer, 22
 Kabat, 17
 Kack, 22
 Kafil, 9
 KafilSuper, 9
 Karathane, 24
 Karbation, 34
 Karmex, 50
 Karphos, 1
 Kayafume, 72
 Kelthane, 3
 Kemate, 56
 Kepone, 3
 Kerb, 30
 Kildip, 23
 Kill-All, 22
 Kill-Ko Rat Killer, 60
 Kiloseb, 24
 Kitazin, 1
 Kiwi Lustr 277, 94
 Klerat, 60
 Klorex, 90
 KM, 90
 Knockmate, 34
 Koban, 59
 Kobu, 93
 Kobutol, 93
 Kopfume, 74
 Korlan, 1
 Krenite, 43
 Kromad, 34
 Kryocide, 10
 Krysid, 66
 Kumulus S, 48
 Kusatol, 90
 Kypfarin, 60
 Kypman 80, 34
 Kypzin, 34
 Lacco Sulfur, 18
 Lance, 2
 Landrin, 2
 Lannate, 2
 Lanox, 2
 Larvicide, 82
 Lasso, 28
 Lawn-Keep, 23
 Lazo, 28
 Lead Arsenate, 22
 lenacil, 49
 leptophos, 1
 Lexone, 47
 lindane, 17
 Line Rider, 23
 Linex, 50
 Linorox, 50
 Linurex, 50
 linuron, 50
 Liphadione, 60
 Liqua-Tox, 60
 Liquid Sulfur, 18
 Liquiphene, 53
 Lironion, 50
 LM91, 60
 Lonacol, 34
 Lorox, 50
 Lorsban, 1
 MAA, 22
 Macondray, 23
 Magnetic 6, 18
 Maki, 60
 malathion, 1
 MAMA, 22
 Mancozeb, 34

Mancozin, 34
 maneb, 34
 Maneba, 34
 Manesan, 34
 Manex, 34
 Manzate, 34
 manzeb, 34
 Manzin, 34
 Maposol, 34
 Marlate, 3
 Matacil, 2
 Mavrik, 9
 MCPA, 23
 MCPB, 23
 MCPP, 23
 M-Diphar, 34
 MeBr, 72
 Mecopex, 23
 mecoprop, 23
 Melprex, 58
 MEMA, 53
 MEMC, 53
 Meothrin, 9
 mephosfolan, 1
 mercaptophos, 1
 Mercuram, 34
 mercury pesticides, 53
 Merge 823, 22
 Merpafol, 51
 Merpan, 51
 merphos, 1
 Mersolite, 53
 Mertect, 59
 Mesamate, 22
 Mesurol, 2
 Metadelphene, 19
 Metalaxyl, 59
 metaldehyde, 87
 metalkamate, 2
 Metam-Fluid BASF, 34
 Metam-Sodium, 34
 Metason, 87
 Metasystox, 1
 metaxon, 23
 methabenzthiazuron, 50
 methamidophos, 1
 Metham-Sodium, 34
 Methane arsonic acid, 22
 Methar 30, 22
 methidathion, 1
 methiocarb, 2
 Meth-O-Gas, 72
 methoprene, 17
 Methoxone M, 23
 methoxychlor, 3
 methoxyethyl mercury acetate, 53
 methoxyethyl mercury chloride, 53
 methoxyethyl mercury pesticides, 53
 methyl bromide, 72
 2-methyl-3,6 dichlorobenzoic acid, 23
 methyl mercury pesticides, 53
 methyl parathion, 1
 methyl trithion, 1
 methylene chloride, 71
 metobromuron, 50
 metolachlor, 27
 metoxuron, 50
 metribuzin, 47
 mevinphos, 1
 Mezene, 34
 MGK, 19
 Micromite, 14
 Mcrozul, 60
 Miller 531, 55
 Milogard, 47
 Milo-Pro, 47
 Minex, 17
 mipafox, 1
 MIPC, 2
 Miracle, 23
 mirex, 3
 mitis green, 22
 Mocap, 1
 Monitor, 1
 monoammonium methane arsonate, 22
 mono-calcium arsenite, 22
 monocrotophos, 1
 monolinuron, 50
 monosodium methane arsonate, 22
 Monuron, 50
 Morocide, 24
 Morrocid, 24
 MSMA, 22
 Multamat, 2
 Mycodifol, 51
 N-2790, 1
 nabam, 34
 Nabasan, 34
 naled, 1
 Namekil, 87
 naphthalene, 70
 naphthene, 70
 naramycin, 57
 NaTA, 29
 Neburex, 50
 neburon, 50
 Neguvon, 1
 Nemacur, 1
 Nemaforme, 75
 Nemanax, 75
 Nemaset, 75
 Nemasol, 34
 Nem-A-Tak, 1
 Nematocide, 75
 Nemispor, 34
 Neopynamin, 9
 Neosorexa PP580, 60
 Nephis, 74
 Netagrone 600, 23
 Nexagan, 1
 Neion, 1
 NIA 9044, 24
 nicotine, 5
 nicotine sulfate, 5
 nicotinic acid-isopropylamine derivative, 41
 Niomil, 2
 Nitrador, 24
 nitrochloroform, 82
 Nitrolime, 89
 Nitropone C, 24
 Nix, 9
 No Bunt, 92
 Nomersam, 34
 Nomolt, 14
 norbormide, 66
 Noxfire, 6
 Noxfish, 6
 NRDC 149, 9
 Nudrin, 2
 Nusyn-Noxfish, 6
 Nuvanol-N, 1
 OFF, 19
 Ofitanol, 1
 Ofunack, 1
 Omite, 13
 OMPA, 1
 Ontracil 8000, 47
 Orthene, 1
 Ortho Danitol, 9
 Ortho Diquat, 26
 Ortho Paraquat, 26
 Orthocide, 51
 oryzalin, 38
 Osaquat super, 26
 Oust, 50
 Outflank 9
 Ovatoxin, 12
 Oxadiazolinone, 42
 Oxamyl, 2
 oxirane, 78
 oxydemeton-methyl, 1
 oxydeprofos, 1
 Paarlant, 38
 Pamisan, 53
 Panogen, 53
 Pansoil, 59
 Paracide, 77
 Para-col, 26
 paradichlorobenzene, 77
 paraformaldehyde, 79
 Paraquat, 26
 parathion, 1
 Paris Green, 22
 Parzate, 34
 Pathclear, 26
 Patoran, 50
 Pattonex, 50
 Pay-off, 9
 PB-Nox, 6
 PCNB, 93
 PCP, 25
 P.C.Q., 60
 PDB, 77
 PDQ, 23
 PEBC, 34
 pebulate, 34
 Pencal, 22
 Penchlorol, 25
 pendimethalin, 38
 Penite, 22
 Pennamine D, 23
 Pennant, 27
 Penncap-M, 1
 Penncozeb, 34
 Penta, 25
 Pentac, 3
 pentachloronitrobenzene, 93
 pentachlorophenolate, 25
 pentachlorophenol, 25
 Pentacon, 25
 Pentagen, 93
 Penwar, 25
 Permasect, 9
 permethrin, 9
 Perthane, 3
 Perthrine, 9
 Pestox, 1
 Phalton, 51
 Phalarid, 51
 phencapton, 1
 Phenostat, 54
 phenthoate, 1
 Phentinoacetate, 54
 phenyl mercuric acetate, 53
 phenyl mercury ammonium acetate, 53
 Phix, 53
 phorate, 1
 phosalone, 1
 Phosdrin, 1
 phosfolan, 1
 phosmet, 1
 phosphamidon, 1
 phosphine, 85
 phostoxin, 85
 Phosvel, 1
 Phosvin, 62
 phoxim, 1
 phthalates, 44
 phthalthrin, 9
 Phytar 560, 22
 Pic-clor, 82

picloram, 46
 picolinic acid 46
 Pillarquat, 26
 Pillarxone, 26
 pindone, 60
 pirimicarb, 2
 pirimiphos-ethyl, 1
 pirimiphos-methyl, 1
 Pirimor, 2
 Pivacin, 60
 pival, 60
 pivaldione, 60
 Pivalyn, 60
 Place-Pax, 60
 Planotox, 23
 Plantgard, 23
 Plictran, 16
 PMAA, 53
 PMAS, 53
 PMP Tracking Powder, 60
 Poast, 37
 Policar, 34
 Polybor, 11
 Polymone, 23
 Polyram M, 34
 Polytrin, 9
 Pomarsol forte, 34
 Pounce, 9
 PP581, 60
 Pramex, 9
 Pramitol, 47
 Prebane, 47
 Precor, 17
 Preeglone, 26
 Prefar, 1
 Preglone, 26
 Prentox, 6
 Priglone, 26
 Primagram, 27
 Primatol, 47
 Primextra, 27
 Primicid, 1
 Primin, 2
 Princep, 47
 Proban, 1
 Prodalumnol double, 22
 Prodan, 10
 profenofos, 1
 profluralin, 39
 Pro-Gibb, 8
 Prolate, 1
 prolin, 60
 promecarb, 2
 prometon, 47
 Prometrex, 47
 prometryn, 47
 pronamide, 30
 propachlor, 28
 Propanex, 28
 propanil, 28
 propargite, 13
 propazine, 47
 propenal 80
 propetamphos, 1
 propoxur, 2
 propylene oxide, 78
 propyl thiopyrophosphate, 1
 prothoate, 1
 Prowl, 38
 Proxol, 1
 prussic acid, 86
 Purivel, 50
 Pydrin, 9
 Pynamin, 9
 Pynosect, 9
 Pyradex, 34
 pyrazophos, 1
 pyrethrins, 4
 pyrethroids, 9
 pyrethrum, 4
 pyridaphenthion, 1
 pyriminil, 68
 Pyrobor, 11
 Quilan, 39
 quinalphos, 1
 Quintox, 69
 quintozene, 93
 Racumin, 60
 Rad-E-Cate, 22
 radione, 60
 Rampage, 69
 Rampart, 1
 Ramrod, 28
 Ramucide, 60
 Randox, 27
 Rapid, 2
 Ratak, 60
 Raticate, 66
 Ratilan, 60
 Ratimus, 60
 Ratomet, 60
 Raviac, 60
 RAX, 60
 red squill, 67
 Reglone, 26
 Reglox, 26
 Regulex, 8
 Remasan Chloroble M, 34
 Resisan, 94
 resmethrin, 9
 Revenge, 29
 RH-787, 68
 Rhodianebe, 34
 Rhodthane, 3
 Ridall-Zinc, 62
 Ridomil, 59
 Ripcord, 9
 Riselect, 28
 Rodent Cake, 60
 Rodex, 60
 Rodex-Blox, 60
 Rodine, 60
 Rody, 9
 Ro-Neet, 34
 ronnel 1
 Ronstar, 42
 Rotacide, 6
 rotenone, 6
 Rotenone Solution FK-11, 6
 Roundup, 43
 Rout (bromacil and diuron), 50
 Rozol, 60
 Ruelene, 1
 Safrotin, 1
 Safsan, 10
 Salvo arsenic, 22
 Salvo 2,4-D, 23
 Sanspor, 51
 Santophen, 25
 Saprol, 59
 Sarclex, 50
 Saturn, 34
 schradan, 1
 Schweinfurt Green, 22
 Scout, 9
 Seedtox, 53
 Selinon, 24
 Semeron, 47
 Sencor, 47
 Sencoral, 47
 Sencorex, 47
 Seritox 50, 23
 sethoxydim, 37
 Setrete, 53
 Sevin, 2
 Shimmer-ex, 53
 Shoxin, 66
 siduron, 50
 simazine, 47
 Simazol, 48
 Sinbar, 49
 Sinituho, 25
 Sinox, 24
 Siperin, 9
 Skeetal, 7
 Sodar, 22
 sodium aluminofluoride, 10
 sodium arsenate, 22
 sodium baborate, 11
 sodium cacodylate, 22
 sodium chlorate, 90
 sodium fluoaluminate, 10
 sodium fluoride, 10
 sodium fluoroacetate, 64
 sodium fluosilicate, 10
 sodium pentaborate, 11
 sodium pentachloro-
 phenate, 25
 sodium silico fluoride, 10
 sodium tetraborate
 decahydrate, 11
 Sofril, 18
 Sok-Bt, 12
 Soiasan, 34
 Sometam, 34
 Sonalan, 39
 Soprabel, 22
 Sopranebe, 34
 Spectracide, 1
 Spike, 50
 Spotrete, 34
 Spra-cal, 22
 Spring Bak, 34
 Spritz-Hormin/2,4-D, 23
 Spritz-Hormit/2,4-D, 23
 Sprout-Nip, 35
 Spur, 9
 S-Seven, 1
 Stam, 28
 Stampede, 28
 Stirofos, 1
 Stomp, 38
 Strobane, 3
 strychnine, 65
 Subdue, 59
 Subitex, 24
 Sul-Cide, 18
 Sulerex, 50
 Sulfex, 18
 sulfometuron methyl, 50
 sulfotep, 1
 sulfur, 18
 sulfur dioxide, 81
 sulfonyl fluoride, 83
 sulprofos, 1
 Sumicidin, 9
 Sumithion, 1
 Super Crab-E-Rad-Calar, 22
 Super D Weedone, 23
 Super Dal-E-Rad, 22
 Supermox, 28
 Superormone Concentre, 23
 Supracide, 1
 Surecide, 1
 Surflan, 38
 Surpass, 34
 Surpur, 28
 Sutan, 34
 Suzu, 54
 Swat, 1
 Sweep, 26
 Syllit, 58
 Synthrin, 9
 Systox, 1
 2,4,5-T, 23
 Tag, 53
 Talan, 24
 Talbot, 22
 Talcord, 9

Talon. 60
 Tamex. 38
 Tamogam. 60
 Tantizon. 47
 Target MSMA. 22
 Tattoo. 2
 2,3,5-TBA. 31
 TBZ. 59
 TCA. 29
 TCBA. 31
 TDE. 3
 tebuthiuron. 50
 Tecto. 59
 teflubenzuron. 14
 Teknar. 7
 Telone II. 76
 temephos. 1
 Temik. 2
 1080. 64
 Tenoran. 50
 TEPP. 1
 terbacil. 49
 terbucarb. 34
 terbufos. 1
 terbuthylazine. 47
 Terbutrex. 47
 terbutryn. 47
 terpene polychlorinates. 3
 Terraclor. 93
 Terraklene. 26
 Terraneb. 96
 Terrazole. 59
 Terro Ant Killer. 22
 Terr-O-Gas. 73
 Tersan. 97
 tetrachlorvinphos. 1
 tetraethyl pyrophosphate. 1
 tetrafluoron. 50
 tetramethrin. 9
 Tetrapom. 34
 Thallium. 63
 thallium sulfate. 63
 thiabendazole. 59
 thibenzole. 59
 Thimer. 34
 thimet. 1
 thiobencarb. 34
 Thiodan. 3
 Thioknock. 34
 Thiolux. 18
 thiometon. 1
 Thion. 18
 Thiophal. 51
 Thiophos. 1
 thiophthalimides. 51
 Thio Tepp. 1
 Thiotex. 34
 Thiovit. 18
 thiram. 34
 Thiramad. 34
 Thirasan. 34
 Thistrol. 23
 Thiuramin. 34
 Thuricide. 7
 Tiezene. 34
 Tiguvon. 1
 Tilcarex. 93
 Tillam. 34
 Tinestan. 54
 Tinmate. 54
 Tirampa. 34
 TMTD. 34
 TMTDS. 34
 T-Nox. 23
 Tolban. 39
 Tolkan. 50
 Toluex. 50
 Tomarin. 60
 Tomilon. 50
 Tomorin. 60
 Topitox. 60
 Torak. 1
 Tordon. 46
 Tota-col. 26
 Toxakil. 3
 toxaphene. 3
 Toxer Total. 26
 Tox-Hid. 60
 TPTA. 54
 TPTH. 54
 TPTOH. 54
 TR-10. 39
 tralomethrin. 9
 Trametan. 34
 Transamine. 23
 Trans-Vert. 22
 Treflan. 39
 triadimefon. 59
 triallate. 34
 Triasyn. 56
 Triazole. 48
 triazophos. 1
 Tribac. 31
 Tribactur. 7
 Tri-ban. 60
 Tribunil. 50
 Tributon. 23
 tricalcium arsenate. 22
 Tricarbamix Z. 34
 trichlorfon. 1
 trichloroacetic acid. 29
 trichlorobenzoic acid. 31
 trichloromethane. 73
 trichloronate. 1
 2,4,5 trichlorophenoxy acetic acid. 23
 triclopyr. 36
 Tri-Clor. 82
 tricyclohexyl tin hydroxide. 16
 trifluralin. 39
 Trifocide. 24
 Triforine. 59
 Trifungol. 34
 Trimangol. 34
 Trimaton. 34
 trimethacarb. 2
 Trinoxol. 23
 Tri-PCNB. 93
 Triphenyl Tin. 54
 Triple Tin. 54
 Tripomol. 34
 Triscabol. 34
 Trithion. 1
 Tritoflorol. 34
 Truban. 59
 Tuads. 34
 Tuban. 23
 Tubothane. 34
 Tubotin. 54
 Tuffcide. 95
 Tupersan. 50
 Turcam. 2
 Turf-Cal. 22
 Turflon. 36
 U 46. 23
 Ultracide. 1
 Unicrop-CIPC. 35
 Unicrop DNBP. 24
 Unicrop Maneb. 34
 Unidron. 50
 Uniroyal DO 14. 13
 Unisan. 53
 Uragan. 49
 Urox B. 49
 Ustaad. 9
 Vacor. 68
 valone. 60
 Vancide. 34
 Vapam. 34
 Vapona. 1
 Vaitox. 29
 VC-13 Nematicide. 1
 Vectal. 47
 Vectobac. 7
 Venturol. 58
 Venzar. 49
 vernolate. 34
 Vertac. 24
 Vi-Cad. 55
 Vikane. 83
 Volid. 60
 Voncaptan. 51
 Vondodine. 58
 Vondozeb. Plus. 34
 Vonduron. 50
 VPM. 34
 Vydate L. 2
 warfarin. 60
 Warfarin Q. 60
 Wax Up. 38
 WBA 8107. 60
 Weed Tox. 23
 Weed-B-Gon. 23
 Weed-E-Rad. 22
 Weed-Hoe. 22
 Weed-Rhap. 23
 Weedar. 23
 Weedatul. 23
 Weedazol. 48
 Weedol. 26
 Weedone. 23
 Weedtrine-D. 26
 Weedtrol. 24
 white arsenic. 22
 Yasoknock. 64
 yellow phosphorus. 61
 Zebtox. 34
 Zerlate. 34
 Ziman-Dithane. 34
 zinc arsenate. 22
 zinc phosphide. 62
 Zinc-Tox. 62
 Zincmate. 34
 zineb. 34
 Zinosan. 34
 ziram. 34
 Ziramvis. 34
 Zirasan. 34
 Zirberk. 34
 Zirex. 34
 Ziride. 34
 Zitox. 34
 Zolone. 1
 Zolvis. 18
 zoocoumarin. 60
 Zotox. 22
 ZP. 62
 ZR-515. 17