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SAFE PESTICUDE

TRANSPORT

HANDLING

STORAGE

MIXING

USE

CLEANUP&DISPOSE

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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 transporting materials a short distance.**
- **Do all you can to prevent a mishap, but be prepared in case of emergency.**
- **Before transporting pesticides, 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

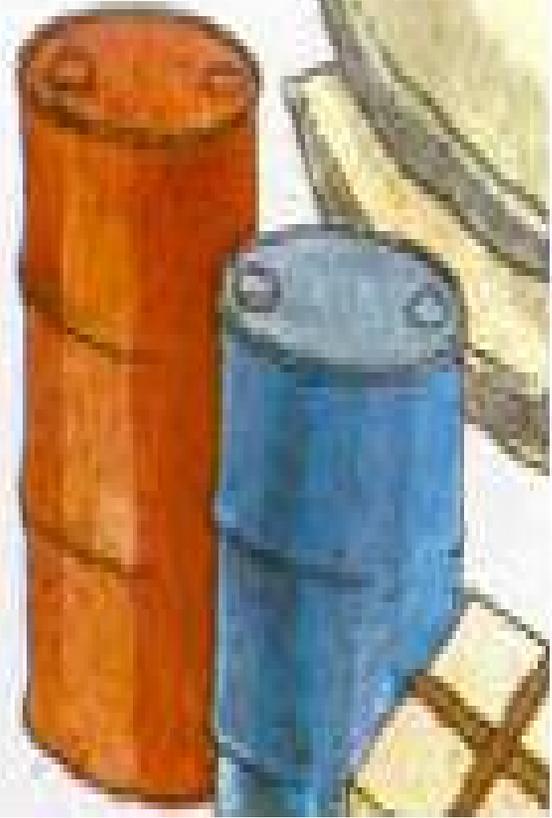
The safest way to transport pesticides is in the back of a truck.

- **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.**
1. **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**



Vehicle Safety

- 2-Never** allow children, other passengers, and pets to be exposed to pesticides during transportation.
- 3-Never** transport pesticides with food, clothing, or other things meant to be eaten by or come into 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.
- 4-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.
- 5-Consider** transporting highly volatile pesticides in separate trips from other chemicals. Spills, or even fumes from opened containers, can make the other chemicals worthless



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 containers."
- "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."

Transporting Pesticide Containers

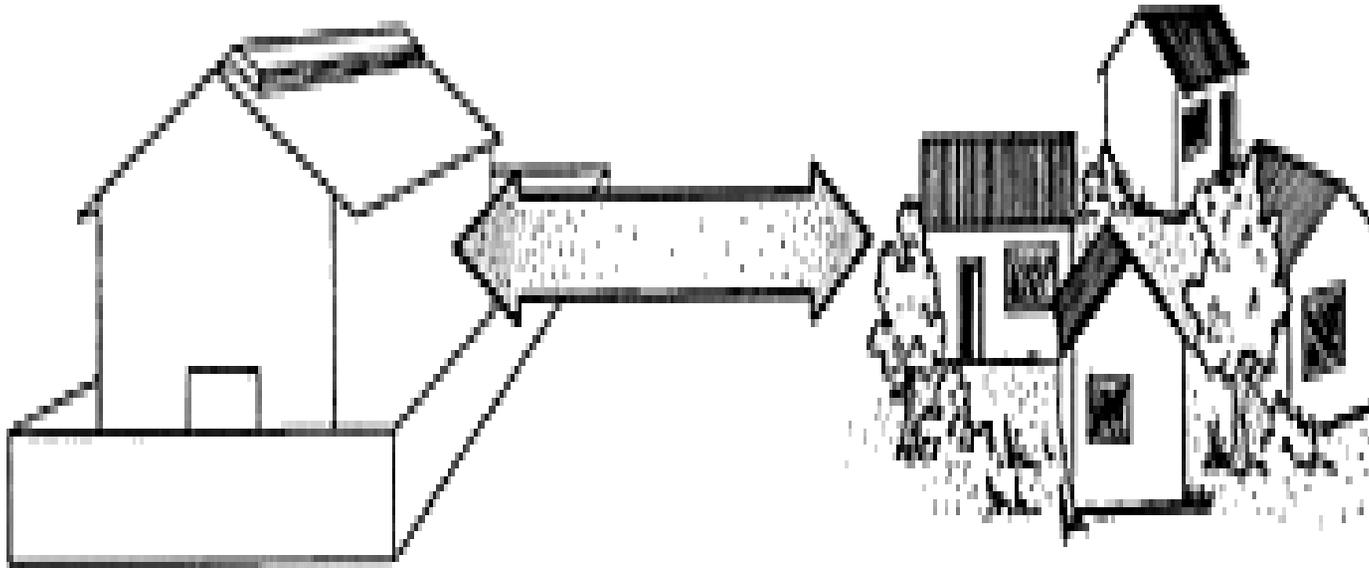
- **Transport pesticides only in containers with intact, undamaged, and readable labels. Inspect containers before loading to be sure that all caps, plugs, and other openings are tightly closed and that there are no pesticides on the outside of the containers. Handle containers carefully to avoid rips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

Pesticide Storage

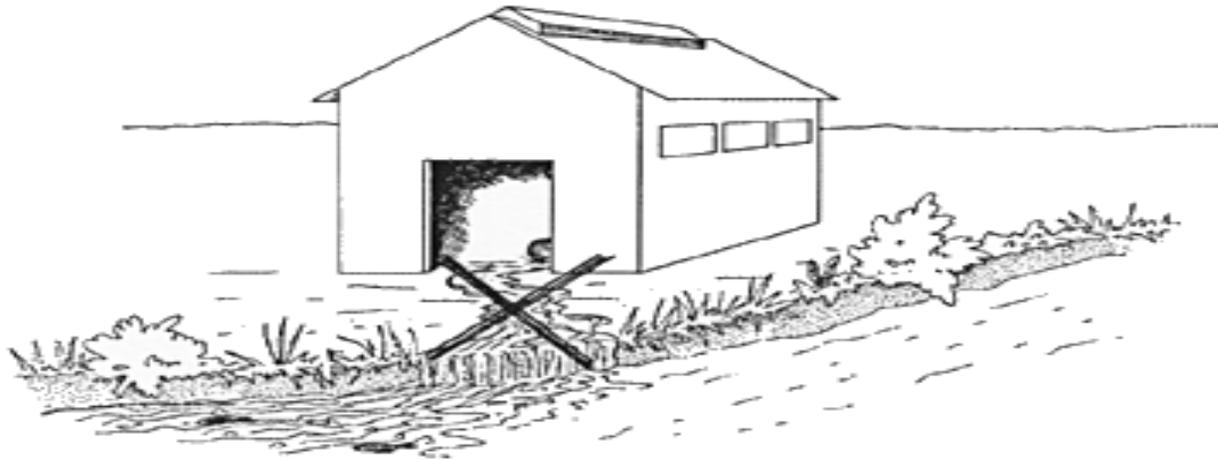
- Many pesticide handlers use existing buildings or areas within existing buildings for pesticide storage.
- However, if large amounts of pesticides will be stored, build a special storage building for pesticides.



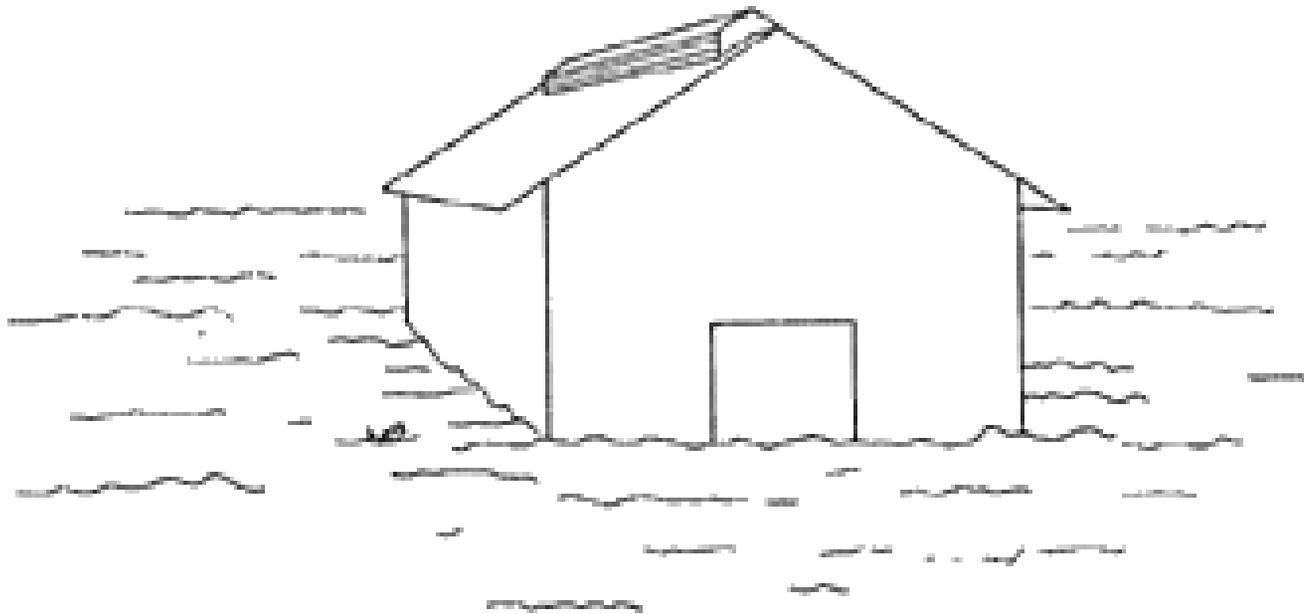
The pesticide store should be located far from human dwellings



The pesticide store should be sited far from rivers and bodies of water, to prevent chemical contamination from entering and poisoning the water



The pesticide store should not be sited in an area subject to flooding, especially during seasonal rains



The pesticide store should have three sides free to allow access to fire-fighting equipment in an emergency

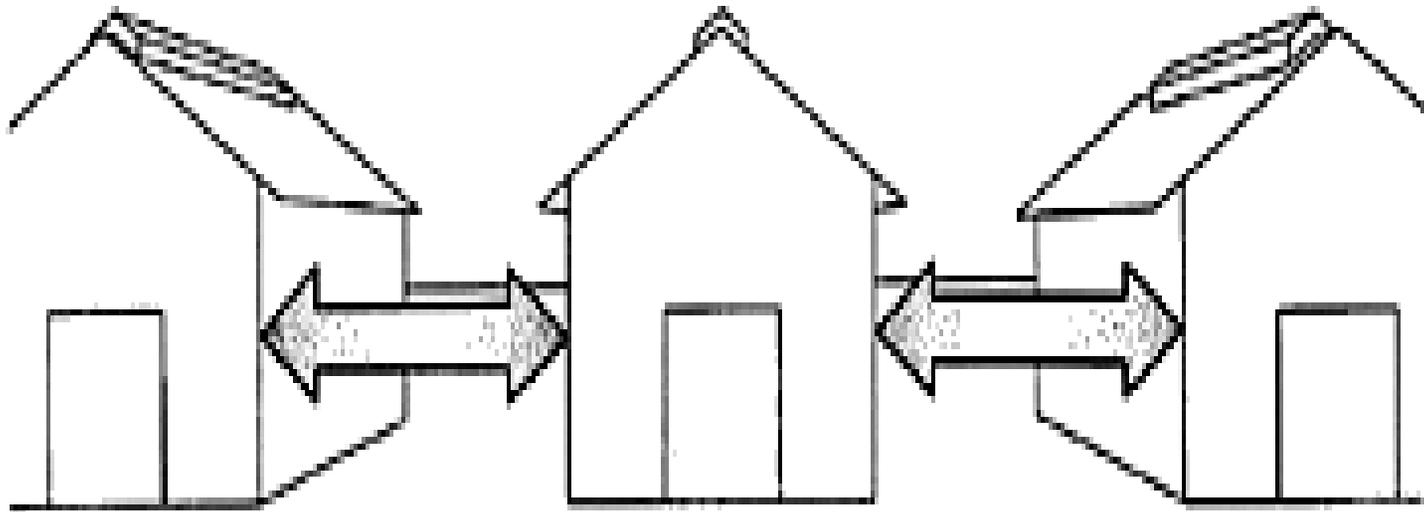
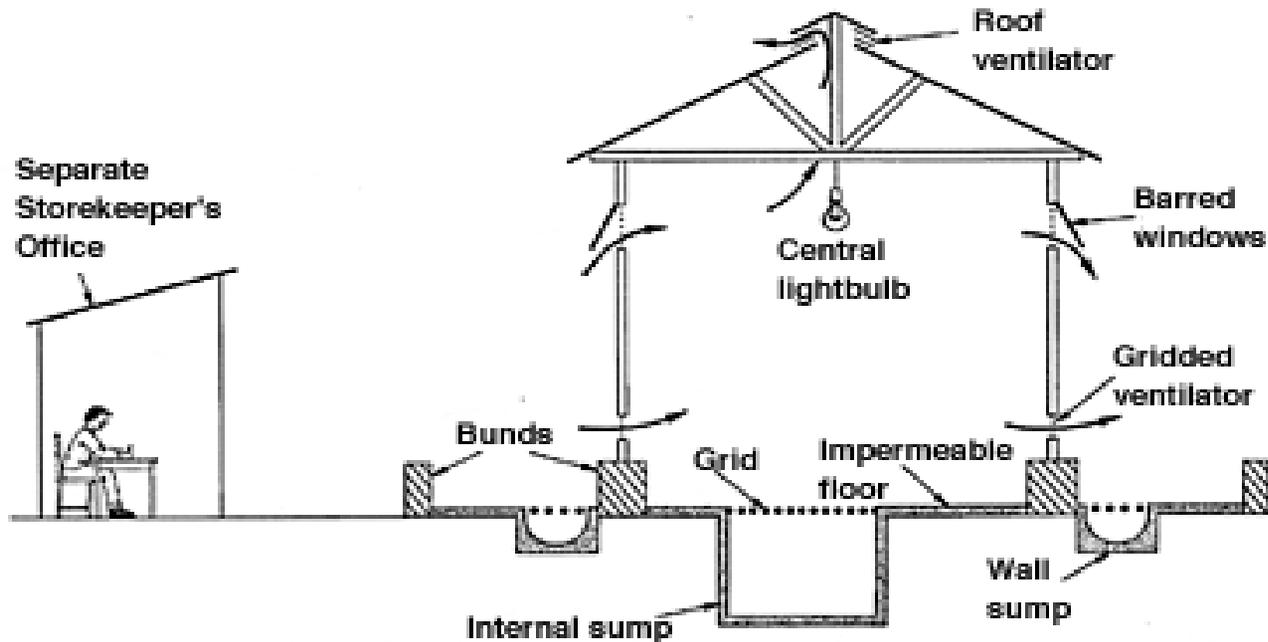
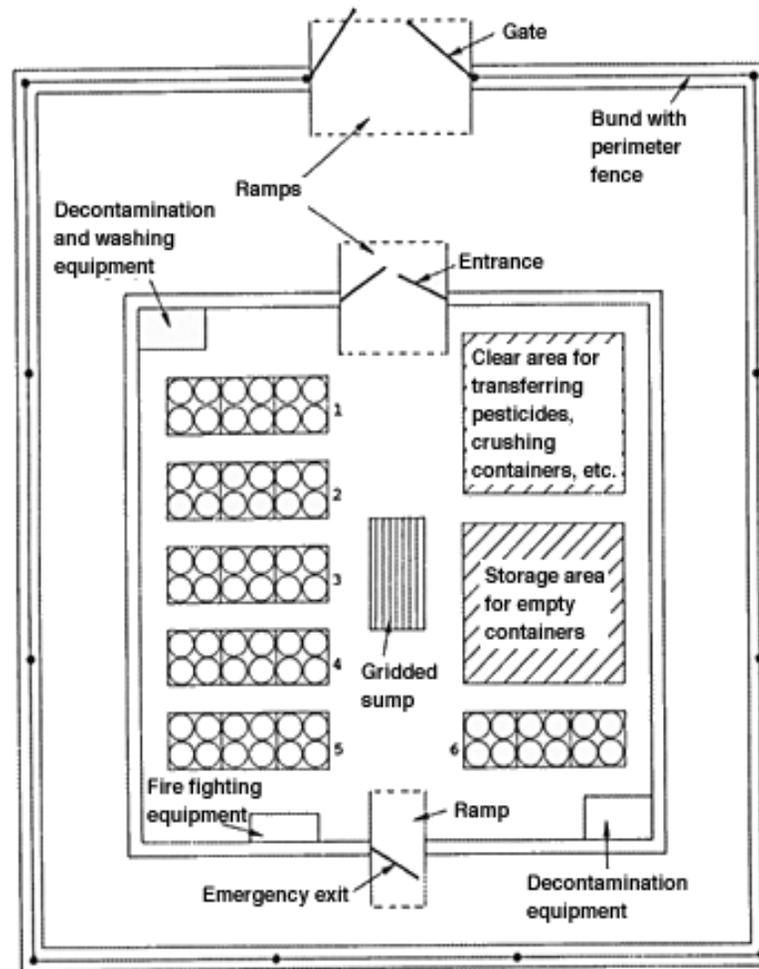


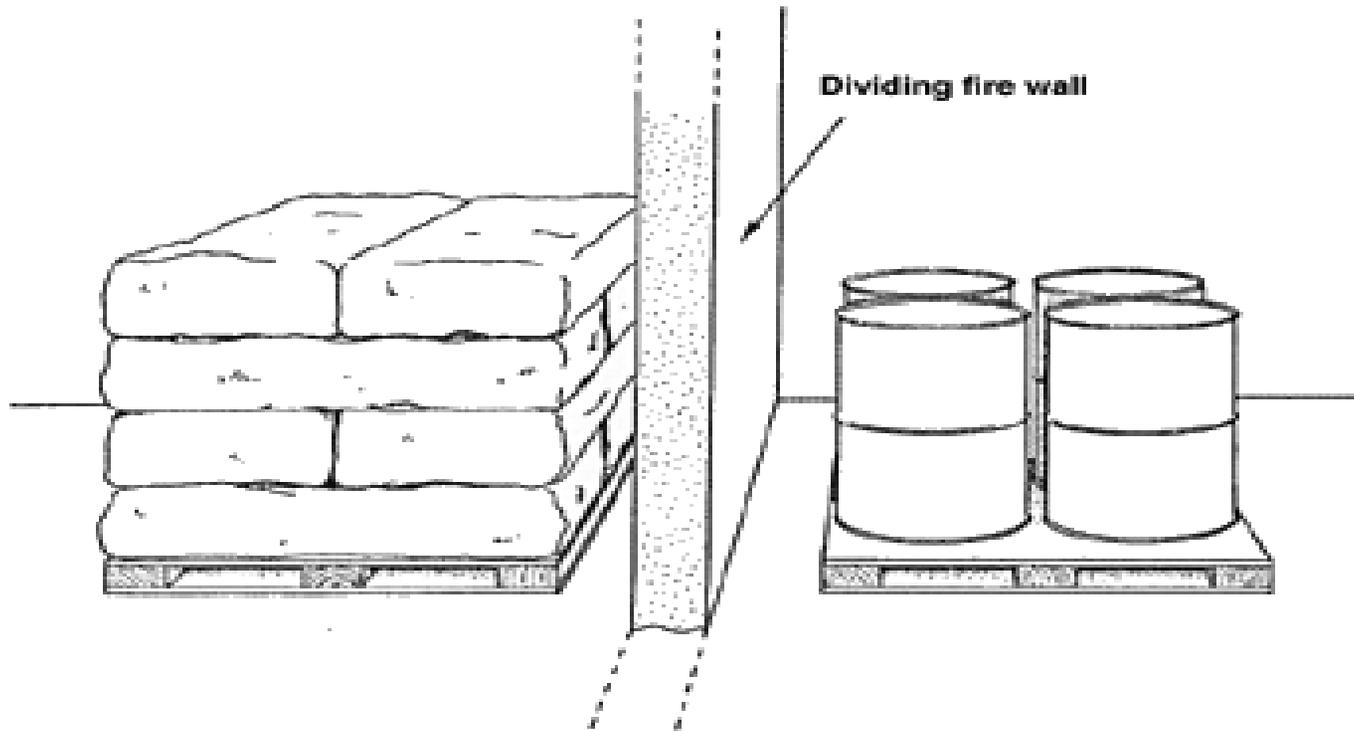
Diagram of a pesticide store showing building features, with storekeeper's office separate from the store (not to scale)



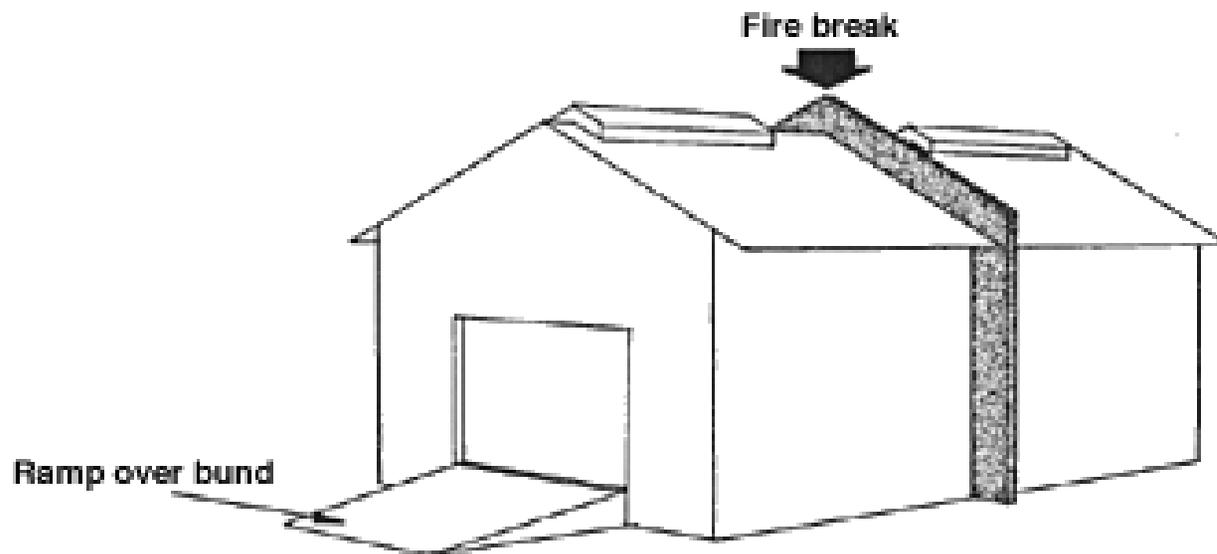
Store layout to show arrangement of facilities (not to scale)



Store dividing wall separating different types of pesticides and acting as an internal fire-break



Fire-break in a pesticide store



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 temperature 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, 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 pad¹¹ 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 large, sealable container with clean water.
- Change the water at least weekly to ensure that it remains safe for use on skin and eyes.
- Keep an [eyewash dispenser](#) immediately available for emergencies

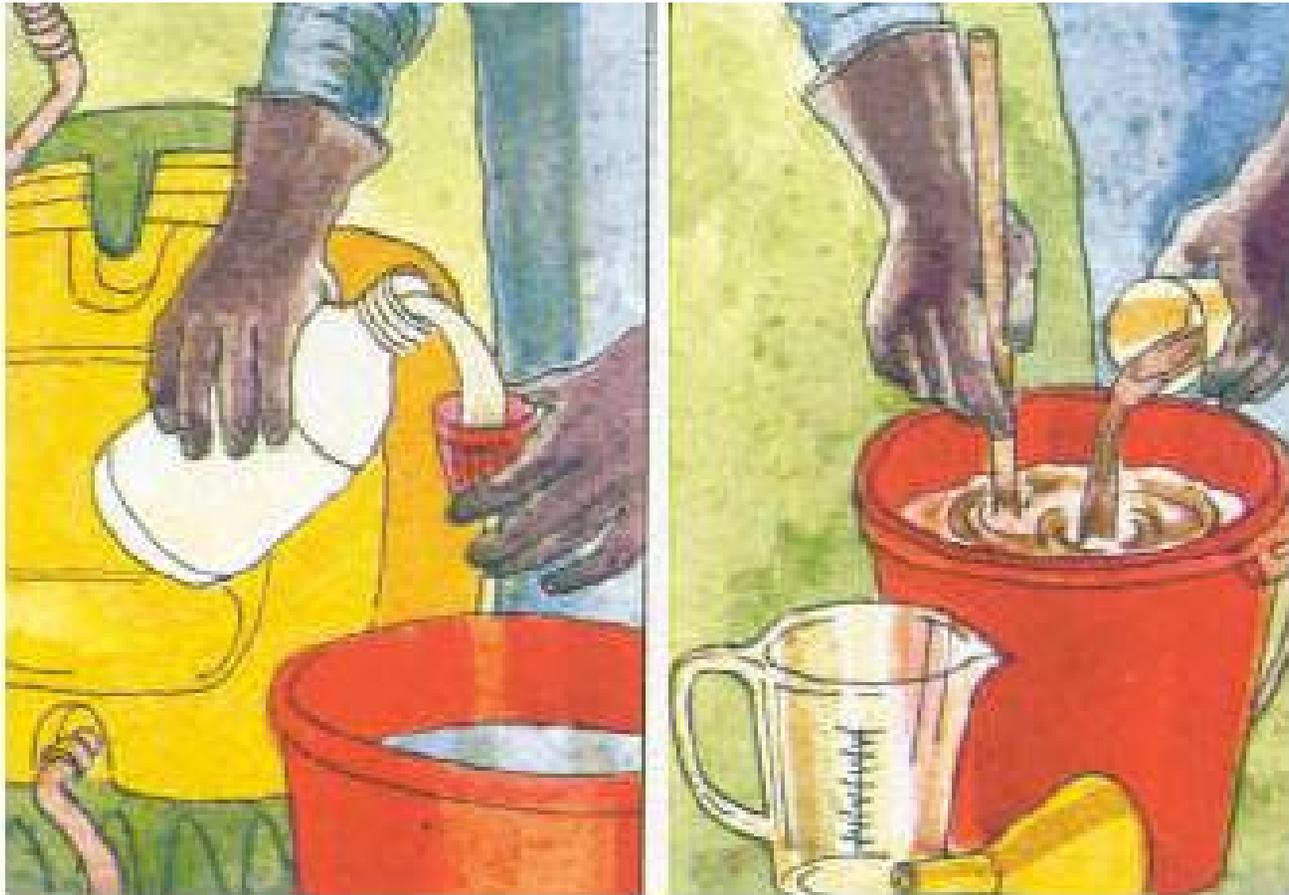
Maintain the Storage Site

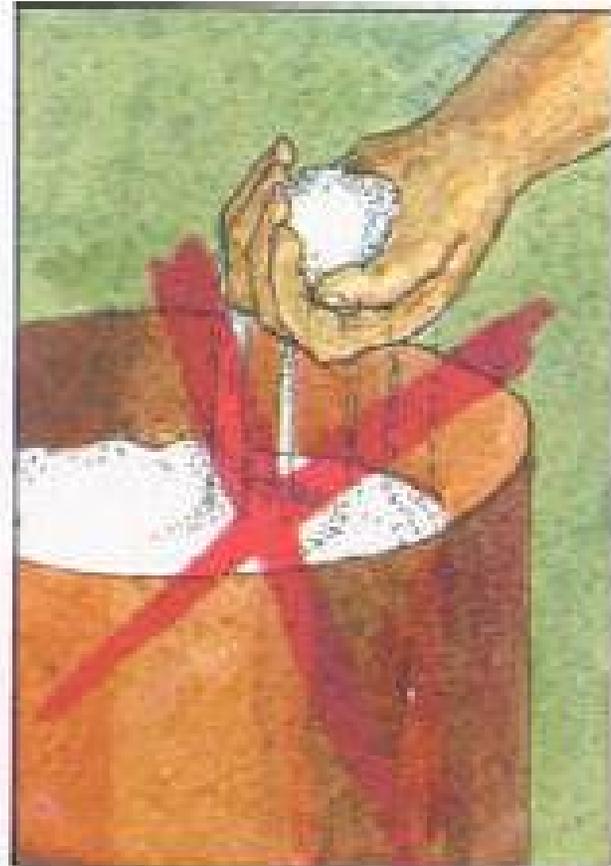
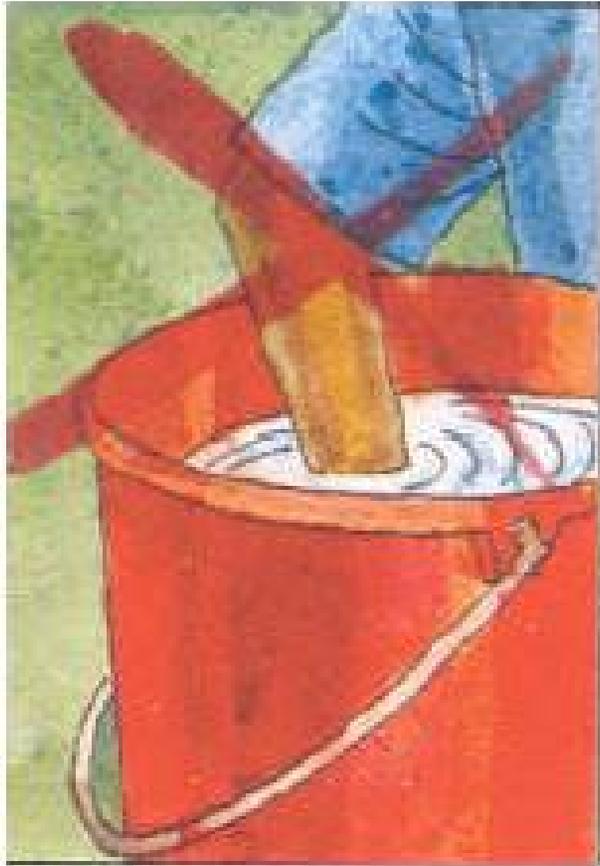
- Prevent contamination
- Keep labels legible
- Keep containers closed
- Use original containers
- Watch for damage
- Store volatile products separately
- Isolate waste products
- Know your inventory
- Consider shelf life
- Prevent Pesticide Fires

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,
- Transfer the pesticide into another pesticide container that originally held the same pesticide and has the same label still intact, or

Watch for damage (continued)

- 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
- 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.

Labeling Statements About Storage

Typical pesticide labeling instructions about storage include:

- "Store at temperatures above 32oF."
- "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."

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 pesticides 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 costly.
- 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 stored pesticides.
- Each time a pesticide is added to or removed from the storage site, update the inventory.
- The list will help you track 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 a long time.
- Buy only as much as you will need for a year.
- 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 indicate 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 .

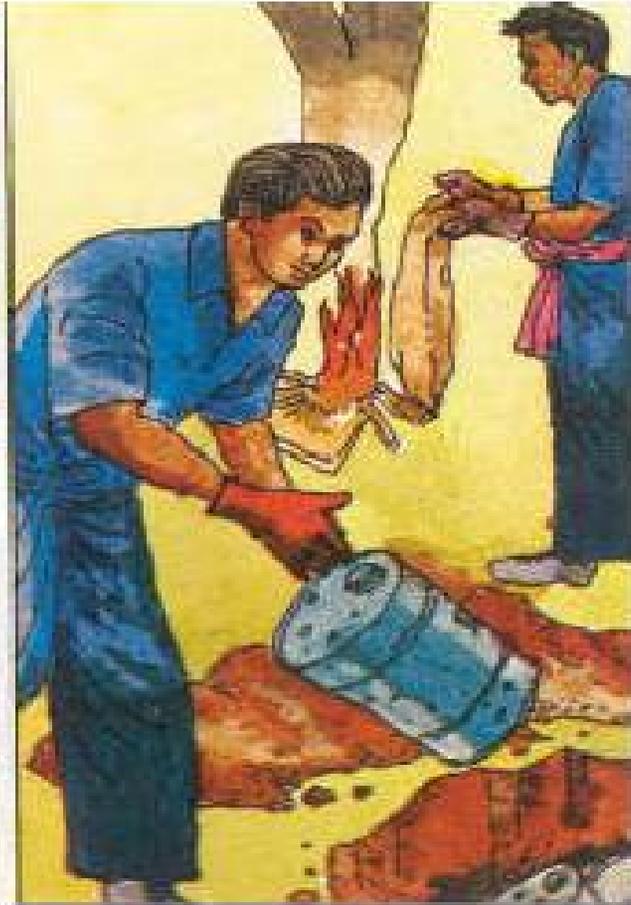
Prevent Pesticide Fires

- 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 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 approved for all types of fires, including chemical fires.
- If you store highly toxic pesticides or large amounts of any pesticide, 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



Empty Pesticide Containers

- 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 in your area, contact your state or tribal pesticide authority





Empty Pesticide Containers

- Do not leave them unattended at the mixing, loading, or application site.
- Never give pesticide containers to children to play with or to adults to use.
- If you have empty pesticide containers that cannot be refilled, reconditioned, [recycled](#), or returned to the manufacturer, crush, break, or puncture them.
- This will make the containers unusable and may also save storage space.
- Dispose of containers in accordance with label directions and with federal, state, tribal, and local laws and regulations.



The instructions

The use instructions will tell you:

- The pests that the manufacturer claims the product will control,
- The plant, animal, or site the product is intended to protect
- In what form the product should be applied
- The correct equipment to use
- How much pesticide to use
- Mixing directions
- Whether the product can be mixed with other often-used products
- Whether the product is likely to cause unwanted injuries or stains to plants, animals, or surfaces
- Where the material should be applied, and
- When and how often it should be applied

PROPER APPLICATION

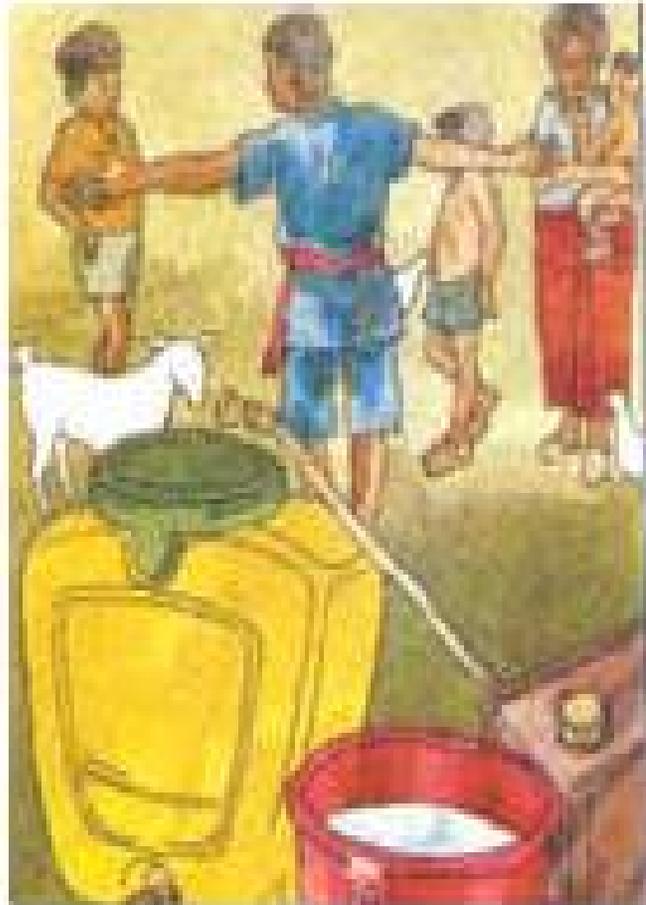
When applying pesticides,

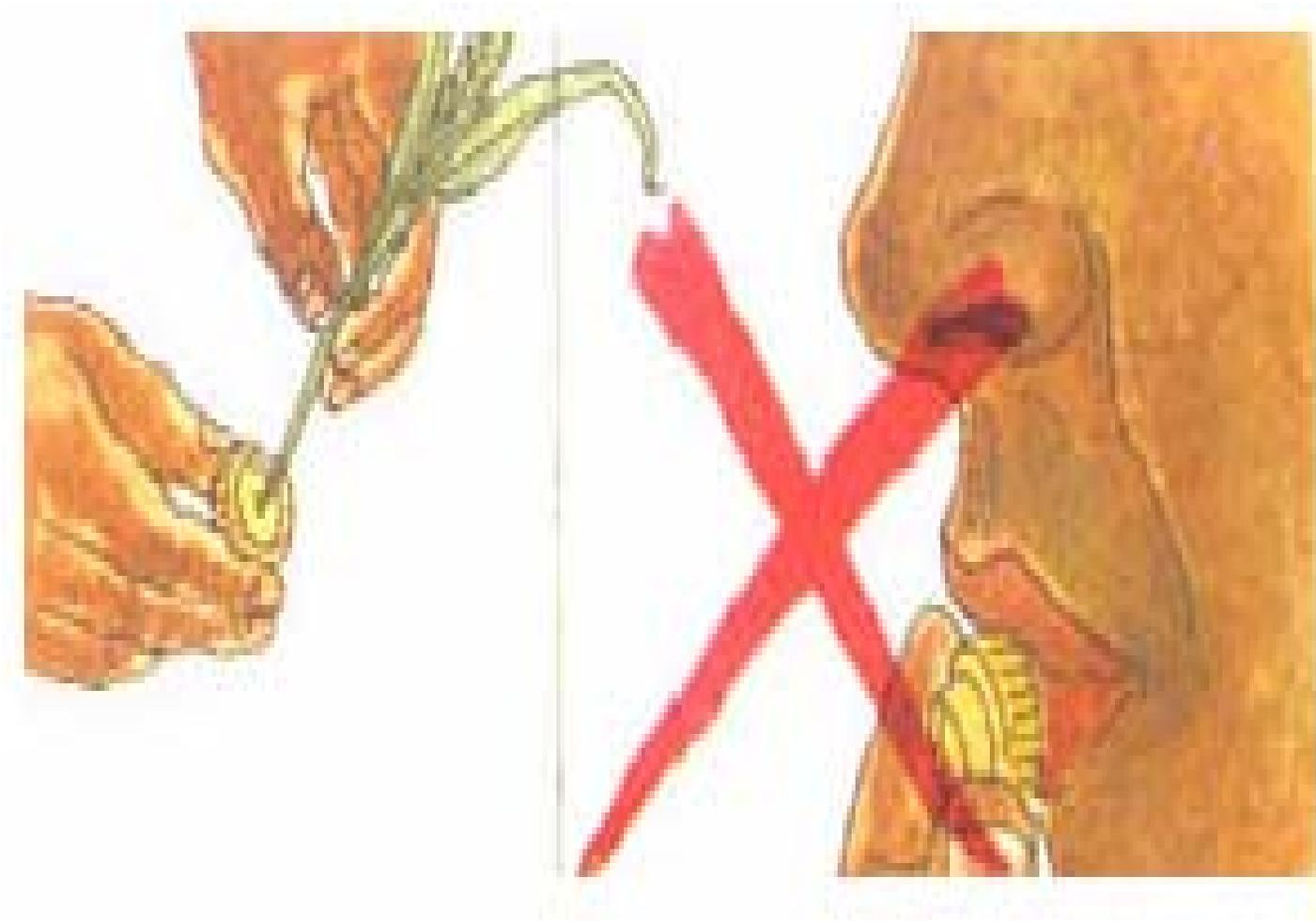
- Wear the protective clothing and Equipment
- Read the label recommends.
- Clear all people, and livestock from the area
- If moderate winds come up while you are working, stop immediately
- Reduce drift by spraying at a low pressure and using a large nozzle opening.
- Generally, the safest time of day to spray to reduce the hazard of drift is early morning
- High temperatures increase vaporization. spray during the cool part of the day to reduce vaporization

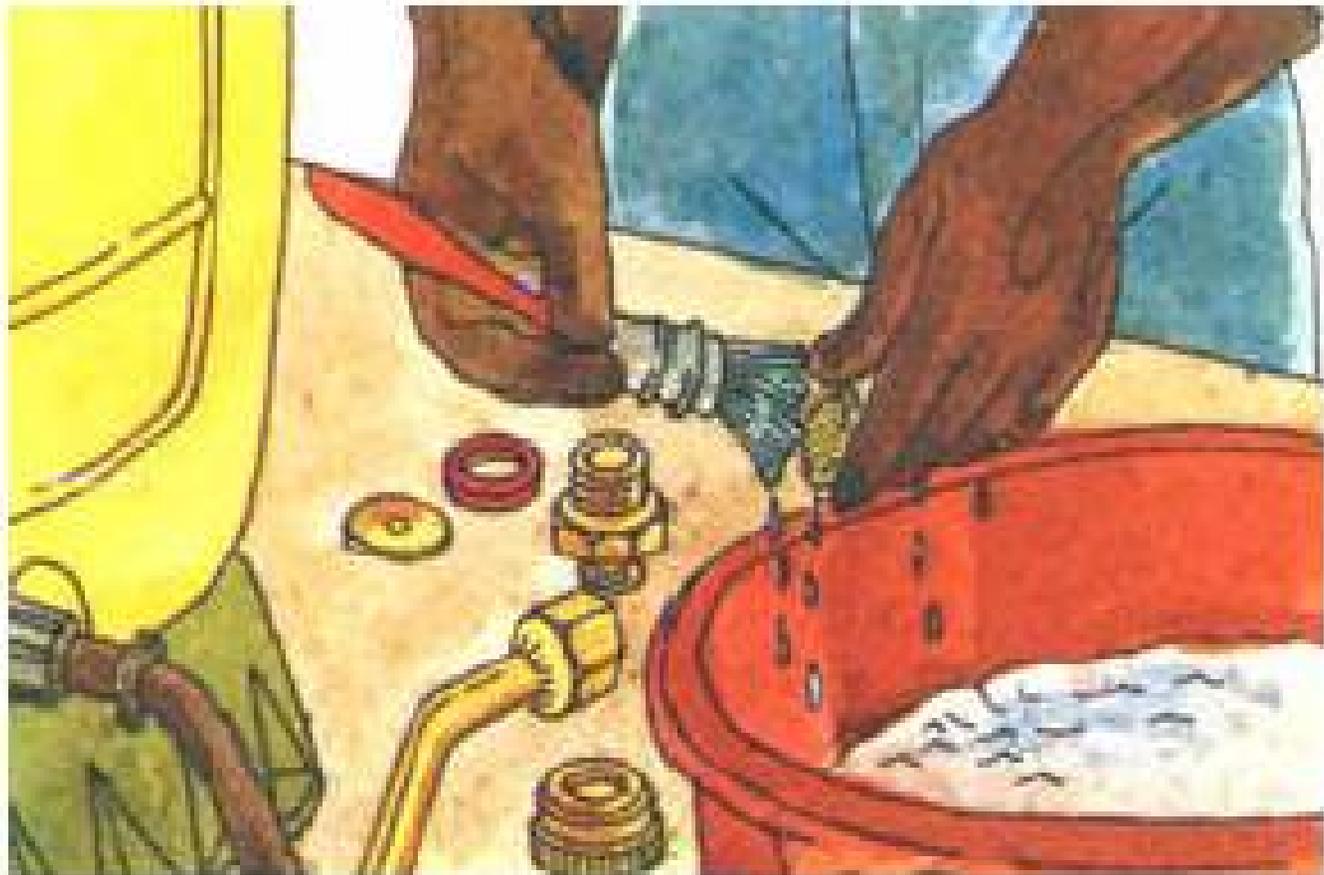
PROPER APPLICATION

To prevent spillage of chemicals,

- Always check application equipment for leaking hoses or connections and plugged, worn, or dripping nozzles before adding pesticide.
- Always spray part of this mixture through the pump, hose, and nozzles at the beginning and end of the soaking period







These instructions will explain several important items

- The pests the product will control
- The crops, animals, or other item the product can be used on safely
- How the product should be applied
- How much to use
- Where and when the material should be applied
- Application to harvest periods

“Days to harvest,”

- A period of time that must pass from the time of application until it is safe to pick and use the crop
- This is the time required for the residue to drop to safe levels.
- It is often listed as a number in parentheses following the crop name.
- It is a mistake to assume that a residue can be washed off.

Sources of Contamination

- **Wash water and spills produced at equipment cleanup sites,**
- **Improper disposal of containers, water from rinsing containers, and excess pesticides,**
- **Pesticide storage sites where leaks and spills are not correctly cleaned up, and**
- **Spills that occur while mixing concentrates or loading pesticides into application equipment**

Pesticide Movement

- In air, through wind or through air currents generated by ventilation systems,
- In water, through runoff or leaching,
- On or in objects, plants, or animals (including humans) that move or are moved offsite .

Air

- **Dusts, spray droplets, and vapors**

all may be carried offsite in the air

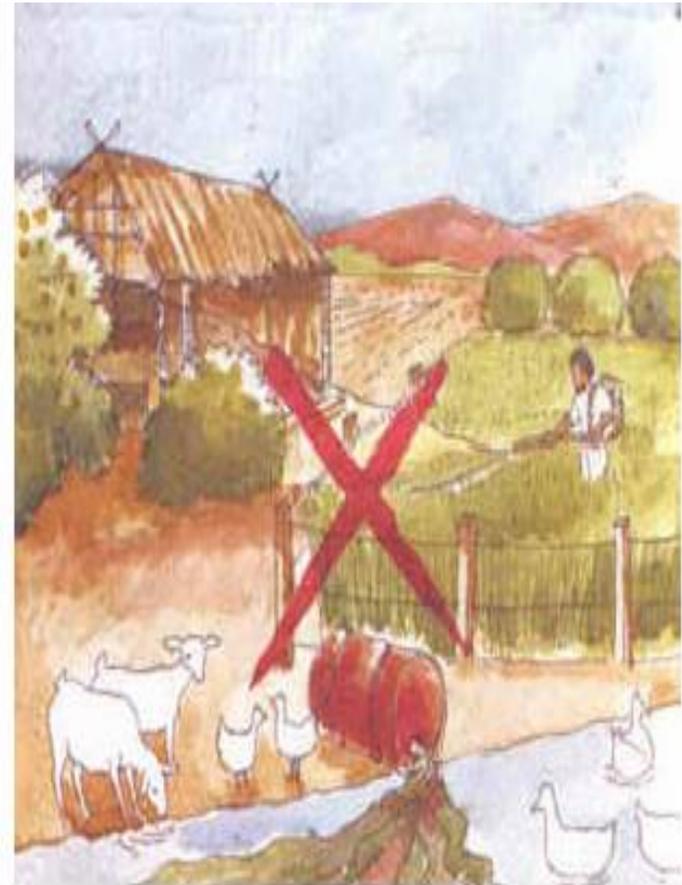
- **Particles and droplets** .Small spray droplets
- **Vapors** -- Pesticide vapors

Any time you release a volatile pesticide in an enclosed area



Water

- Drift, leaching, and runoff from nearby applications,
- Spills, leaks, and back-siphoning from nearby mixing, loading, storage, and equipment cleanup sites,
- Improper disposal of pesticides, rinsates, and containers



On or in Objects, Plants, or Animals

- Pesticides may stick to shoes or clothing, to animal fur, or to blowing dust and be transferred to other surfaces
- When pesticide handlers bring home or wear home contaminated personal protective equipment, work clothing,
- **Pesticides** may stick to treated surfaces, such as food or feed products that are to be sold.

The instructions

The use instructions will tell you:

- The pests that the manufacturer claims the product will control,
- The plant, animal, or site the product is intended to protect
- In what form the product should be applied
- The correct equipment to use
- How much pesticide to use
- Mixing directions
- Whether the product can be mixed with other often-used products
- Whether the product is likely to cause unwanted injuries or stains to plants, animals, or surfaces
- Where the material should be applied, and
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PROPER APPLICATION

When applying pesticides,

- Wear the protective clothing and Equipment
- Read the label recommends.
- Clear all people, and livestock from the area
- If moderate winds come up while you are working, stop immediately
- Reduce drift by spraying at a low pressure and using a large nozzle opening.
- Generally, the safest time of day to spray to reduce the hazard of drift is early morning
- High temperatures increase vaporization. spray during the cool part of the day to reduce vaporization

PROPER APPLICATION

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- Always check application equipment for leaking hoses or connections and plugged, worn, or dripping nozzles before adding pesticide.
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- This is the time required for the residue to drop to safe levels.
- It is often listed as a number in parentheses following the crop name.
- It is a mistake to assume that a residue can be washed off.

Sources of Contamination

- Wash water and spills produced at equipment cleanup sites,
- Improper disposal of containers, water from rinsing containers, and excess pesticides,
- Pesticide storage sites where leaks and spills are not correctly cleaned up, and
- Spills that occur while mixing concentrates or loading pesticides into application equipment

Storage and Disposal

- **FARMERS** should store all pesticides in their original containers in a locked cabinet. ***No exceptions if you are concerned about children's lives*** They should be protected from temperature extremes, some can be damaged upon freezing, others can be altered by heat.
- Do not store pesticides in the home
- Never use empty pesticide containers for other uses,
- Never allow children to play with empty containers.
- If possible, break the containers or punch a hole through the bottom before disposal.
- Do not burn paper containers .

Pesticide residues

- Too much pesticide is applied to the crop or animal,
- The days-to-harvest, days-to-grazing, or days-to-slaughter directions on the pesticide labeling are not obeyed, or
- Pesticides move out of the release site and contaminate plants or animals nearby.

Harmful Effects from Residues

A residue is the part of a pesticide remaining in the environment after an application or spill

- Surface type, chemical composition, and pH,
- Surface moisture,
- Presence of microorganisms,
- Temperature,
- Exposure to direct sunlight

Hazard = Toxicity x Exposure

- **Hazard** is the risk of harmful effects from pesticides. Hazard depends on both the **toxicity** of the pesticide and your **exposure**
- **Exposure**
 - When a pesticide contacts a surface or organism, that contact is called a pesticide exposure.
 - For humans, a pesticide exposure means getting pesticides in or on the body.
 - The toxic effect of a pesticide exposure depends on how much pesticide is involved and how long it remains there

Types of Exposures

- Oral exposure (when you swallow a pesticide),
- Inhalation exposure (when you inhale a pesticide),
- Ocular exposure (when you get a pesticide in your eyes),
or
- Dermal exposure (when you get a pesticide on your skin).

Oral exposures

- Not washing hands before eating, drinking, smoking, or chewing,
- Mistaking the pesticide for food or drink,
- Accidentally applying pesticides to food, or
- Splashing pesticide into the mouth through carelessness or accident

Inhalation exposures

- Prolonged contact with pesticides in closed or poorly ventilated spaces,
- Breathing vapors from fumigants and other toxic pesticides,
- Breathing vapors, dust, or mist while handling pesticides without appropriate protective equipment,
- Inhaling vapors immediately after a pesticide is applied; for example, from [drift](#) or from reentering the area too soon, and
- Using a respirator that fits poorly or using an old or inadequate filter, cartridge, or canister.

Dermal exposures

- Not washing hands after handling pesticides or their containers,
- Splashing or spraying pesticides on unprotected skin or eyes,
- Wearing pesticide-contaminated clothing (including boots and gloves),
- Applying pesticides (or flagging) in windy weather,
- Wearing inadequate personal protective equipment while handling pesticides, and
- Touching pesticide-treated surfaces.

Eye exposures

- Splashing or spraying pesticides in eyes,
- Applying pesticides in windy weather without eye protection,
- Rubbing eyes or forehead with contaminated gloves or hands, and
- Pouring dust, granule, or powder formulations without eye protection.

Toxicity

- Toxicity is a measure of the ability of a pesticide to cause harmful effects.

Toxicity depends on:

- Type and amount of active ingredient(s),
- Type and amount of carrier or solvent ingredient(s),
- Type and amount of inert ingredient(s),
- Type of formulation, such as dust, granule, powder, or emulsifiable concentrate.

Signs and Symptoms of Harmful Effects

External irritants

- Redness, blisters, rash, and/or burns on skin, and swelling, a stinging sensation, and/or burns in eyes, nose, mouth, and throat.

Pesticide poisoning may cause:

- Nausea, vomiting, diarrhea, and/or stomach cramps, headache, dizziness, weakness, and/or confusion, excessive sweating, chills, and/or thirst, chest pains, difficult breathing, cramps in your muscles or aches all over your body.

Pesticide on skin

- Drench skin and clothing with plenty of water
- Remove personal protective equipment and contaminated clothing.
- Wash skin and hair thoroughly with a mild liquid detergent and water
- Dry victim and wrap in blanket or any clean clothing at hand. Do not allow to become chilled or overheated.
- If skin is burned or otherwise injured, cover immediately with loose, clean, dry, soft cloth or bandage
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Pesticide in eye:

- Use an eyewash dispenser, if available. Otherwise, hold eyelid open and wash with a gentle drip of clean running water positioned so that it flows across the eye rather than directly into the eye.
- Rinse eye for 15 minutes or more.
- Do not use chemicals or drugs in the rinse water. They may increase the injury.
- Wash eye quickly but gently. Wash eye quickly but gently.

Pesticide in mouth or swallowed:

- Rinse mouth with plenty of water
- Give victim large amounts (up to 1 quart) of milk or water to drink.
- Induce vomiting only if instructions to do so are on the labeling