

Module

3

Safe Handling Procedures

After you have completed this module, you will be able to:

- *Handle pesticides safely while buying, transporting, storing, mixing, applying and cleaning up*
- *Select suitable protective clothing and equipment as required*
- *Care for and store protective clothing and equipment in a safe manner*
- *Dispose of pesticide containers as regulated and understand the importance of triple rinsing*
- *Deal appropriately with surplus spray or pesticide concentrates*

Personal Protective Equipment

Safety is critical for all activities involving pesticides.

Make sure that everyone who works with pesticides receives training on safety and proper handling of pesticides. Inform anyone entering a treated field about re-entry intervals and possible health risks. It is your responsibility to comply with label instructions and all regulations pertaining to storage, handling and use of pesticides, unless you hire a contractor.

Personal protective equipment or PPE is required to handle almost any agricultural/commercial pesticide. The type of PPE needed for any particular product is listed on the pesticide label, as we have seen in module 1. The directions provided on the label have to be understood as the minimum requirements, NOT as option suggestions, and they have to be followed very closely. For example, if the label calls for a respirator it can't be substituted with a dust mask, or anything less than what the label indicates.

Protective Clothing and Equipment

The amount and type of protective clothing and equipment you need depends on the pesticide toxicity, volatility and formulation as well as the type and length of exposure and the application method used.

General Principles

- Pesticides with greater toxicity require more protective equipment.
- The more toxic the product, the greater the need for protective equipment.
- Pesticides which are solutions, emulsifiable concentrates or powders are more likely to be absorbed through the skin or be inhaled and therefore require more protective equipment.

The type of exposure (ocular, dermal or inhalation) that may occur when handling a pesticide also determines the protective equipment you need.



For example, if the potential for exposure is mostly on the skin, then a respirator may not be needed.

Choose the protective equipment that can handle the rigor of the work and the length of the application.

For example, if you are walking through a field to do an application and bending over frequently, disposable coveralls may start to rip in the crotch or armpit area and no longer provide appropriate protection.

Follow label directions and hazard symbols to determine the type of protective equipment to wear. You will find this information in the precaution section of the label.

Sometimes the label will not mention specific equipment but will imply the protection needed. For example, the label may say:

- Avoid breathing dust or fumes
- Avoid skin contact
- Keep out of eyes.

Statements like these indicate that personal protective equipment is required. Additional or more specific information may be found on the material safety data sheet (MSDS) or from the pesticide manufacturer.

Minimum Protection

This is the minimum level of protection required for working with **dilute, less toxic or granular pesticides**. Where there is direct contact with the pesticide or handling of concentrate, **add extra protection**. Table 1 Protective Clothing Requirements gives the requirements of various types of protective clothing. Make sure you wear recommended clothing that is in good condition and clean.



Example of Label Precaution Statement

Harmful if swallowed or absorbed through skin. Avoid breathing vapours or spray mist. Avoid contact with skin and eyes.

Table 1. Protective Clothing Requirements



| Equipment and Clothing | | Requirements |
|------------------------|---|--|
| Hard Hat | ✓ | Wide brimmed, plastic head-band |
| Coveralls | ✓ | Wear closed at neck. over long-sleeved shirt and full-length pants |
| Gloves | ✓ | Unlined, chemically resistant (e.g., nitrile or neoprene) |
| Boots | ✓ | Neoprene overboots or high rubber boots |
| Glasses | ✓ | No contact lenses |

Hard Hat

Protect your head when handling or applying pesticides as the head and neck area absorbs pesticide spray and vapors much easier than other parts of your body.

When choosing a hat consider the following:

- Should protect your hair, ears and scalp from spray, dust and powders
- Must be wide brimmed and washable
- Must not have a leather inner band.

Ideally head protection should include a close fitting hood attached to coveralls.

Coveralls

Provide an extra layer of protection over regular clothing. Anyone who handles pesticides should wear at least a long sleeved shirt and pants or coveralls.

When choosing coveralls, consider the following:

- If wearing cloth coveralls, choose a material that is heavy and has a tight weave. The advantage of wearing cloth coveralls is that they “breathe” better than most disposable coveralls; the disadvantage is that cloth coveralls do not have a moisture repellent surface and must be washed after each use.
- Wear coveralls closed at the neck, wrists and ankles over a long-sleeved shirt and full-length pants.
- Wear the coverall legs over the boots, not tucked inside.
- Disposable coveralls made of non-woven material are sometimes breathable and are coated with a moisture repellent finish.

Before buying disposables, make sure they are recommended for the pesticides you intend to use. Do not launder disposable coveralls. Replace them when severe pilling (balls of fiber on the surface), rips or holes occur. Place used coveralls in a plastic bag and take them to an approved landfill site. Do not burn.

Gloves

Wear gloves when handling, mixing or pouring concentrates and adjusting spray equipment. Wear gloves during application if you are directly

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exposed to concentrated pesticide, spray, rinsing containers and during the cleanup operation. Your hands and forearms are usually the areas most exposed to pesticides.

When choosing gloves ensure the following:

- Unlined and chemical resistant (e.g., nitrile or neoprene)
- Long enough to cover the wrist and lower forearm
- Well-fitting glove so it is less clumsy and more comfortable.

Cuff the glove to prevent pesticide from running onto the arm when you raise your hands. Wear under the sleeve of the coverall to prevent pesticide running into the glove when you lower your hands.

Boots

Use unlined neoprene overboots or high rubber boots. Wear pants/coveralls over boots to prevent accidental spills draining into the boot.

Extra Protection

You need extra protection (see Table 2 Clothing for Extra Protection) when you mix, load and handle pesticide concentrates, as well as when you work with highly toxic pesticides. Check the pesticide label to identify when extra protection is necessary. Make sure your clothing and equipment is recommended and not worn out or malfunctioning.

Table 2. Clothing for Extra Protection



| Equipment and Clothing | Requirements |
|------------------------|---|
| Goggles or Face Shield | Fog free, chemical resistant |
| Ear Plugs | Disposable plugs are recommended |
| Respirator | Ensure it has the proper cartridge for the pesticide being used (may also be needed during application) |
| Coveralls | Chemically resistant or disposables, worn over regular clothing |
| Waterproof Apron | Neoprene or polyethylene when mixing and loading |

Goggles or Face Shields

Goggles and face shields protect your eyes and face from pesticide vapors, dust and splashes. Ensure the following.

- They must be snug fitting, clean, chemically resistant and approved for pesticide use.
- Wear goggles or a face shield when handling concentrated pesticides and when recommended on the pesticide label.
- **Do not wear contact lenses.** Contact lenses absorb pesticides and cannot be cleaned.

Avoid contaminating gloves inside and clean them daily. Keep several pairs of clean gloves handy. Replace frequently.

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- Face shields alone may not provide enough protection for the eyes when spraying mists or using volatile pesticides.

Ear Plugs

Ear plugs protect your ears when dust, sprays and spills are likely to contaminate the head. Use disposable ear plugs, and change them

Respirator Considerations

- Respirators come in different sizes and shapes. Buy the type recommended for pesticides and one that provides a comfortable fit.
- A full-face respirator is one option that also provides eye protection.
- Adjust for an airtight fit over nose and mouth.
- Test for air seal. Place the palms of the hands over the cartridge caps, inhale gently and hold. Inhaling creates a “suction” and therefore the facepiece will collapse slightly if a proper fit has been achieved.
- Beards and mustaches can prevent obtaining an air seal from forming around your mouth and nose..
- Replace activated charcoal cartridge or disposable respirator when breathing becomes difficult (plugging) or at the first detection of a chemical odor. Have spare cartridges on hand.
- A dust mask is not a respirator and will only provide partial protection from granular or powdered formulations during handling.

See Table 3 Types of Respirators for the types of respirators.

Table 3. Types of Respirators

| Type | Description |
|------------------------------------|--|
| Cartridge Respirator | Consists of a pre-filter to remove dusts and one or two cartridges filled with charcoal to remove pesticide mists and vapors. |
| Cannister Respirator | These also have a pre-filter but have a larger volume of charcoal than the cartridge respirator and therefore can be worn when there is a higher concentration of mists or vapors. |
| Air Powered Purifying Respirator | These use an electric pump to draw air through a charcoal cartridge and a pre-filter. The purified air is delivered to a tight fitting face mask or a loose fitting helmet. They may be more comfortable than other types of respirators on hot days when respiratory protection is required for longer periods of time. |
| Self Contained Breathing Apparatus | Supplies air through a tube on the head-piece from a tank on the wearer's back. These respirators are used when applying fumigants or for use in emergencies such as a fire or a major spill. |

The first three respirators DO NOT supply any oxygen and therefore they should never be used in oxygen deficient atmospheres when fumigations are being performed.

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Coveralls

Use coveralls when a pesticide is highly toxic and when you will be exposed to pesticide mist or vapor.

Consider the following when using coveralls:

- Coated to provide high repellency and non-breathable.
- Impermeable rainwear is excellent for liquid repellency, but is non-breathable. This type of coverall or gear is very warm and may pose a risk of heat exhaustion on a warm day.

Absorption rates in the abdomen are 2.1 times greater than the absorption rate of the forearm

Apron

An apron provides protection to the abdomen and genital area. Wear a waterproof apron for added protection when handling all concentrated pesticides.

What Not to Wear

- Natural rubber or plastic gloves
- Leather or cloth gloves, shoes or boots leather cell phone and electronic device holders
- Leather belt or wrist watch band
- Contact lenses
- Baseball cap

These items absorb chemicals and once contaminated will prolong exposure of your body to pesticides. They **cannot** be cleaned.

Absorption rates in the genital area are 11.8 times greater than the absorption rate of the forearm

Other Considerations for Protection

Some tractor cabs are equipped with activated carbon cartridges and filters that can remove chemicals from the air while spraying in the field. When operating this type of tractor, you can temporarily remove some protective clothing and equipment, for example, respirator, goggles and gloves. However, you still require protection when changing nozzles or adjusting equipment.

A tractor cab without carbon cartridges should be ventilated by keeping the door or window open when used for pesticide applications. If the tractor's blower unit does not have an organic vapor cartridge, use a personal respirator cartridge if the pesticide label recommends a respirator be used.

General Precautions

Read label instructions before using a pesticide and be familiar with the signs and symptoms of poisoning and first-aid procedures to deal with poisoning.

- Never eat or drink when handling or applying pesticides.
- Don't keep food items in a vehicle used to transport or apply pesticides.
- Always wash hands and face with soap and water before eating or going to the bathroom.
- Wear recommended protective clothing and equipment.
- Advise another adult that you are applying pesticides. Tell him or her the product you are applying in case of an accident.
- Always shower thoroughly at the end of the day, washing all your body including under the fingernails.
- Wash your protective clothing and equipment daily with soap and water.
- Keep pesticides in original containers or properly labeled containers you use exclusively for pesticides.
- Store pesticides in a locked and well ventilated building, located away from any body of water and not adjacent to any occupied buildings.

Ensure that anyone assisting with handling, preparation, application or cleanup of pesticides is familiar with the nature of the pesticide, the poisoning symptoms, the requirements for protective equipment and what to do in the case of emergency.

Buying Pesticides



Before you buy a pesticide, read the label on the following page and answer the following questions:

- Is the product registered for the planned use?
- Do you have the proper application equipment and safety gear?
(Keep personal protective equipment on hand when transporting pesticides.)
- Can the pesticides be used safely under the conditions on your farm?
(Think of sensitive areas, such as wells, wildlife, special crops, shelterbelts, creeks, rivers, sloughs neighbors, etc.)
- Is the pesticide compatible with your integrated pest management programs?
- Is there a pesticide available that is less toxic, less persistent or more target specific?
- How much pesticide will you need?

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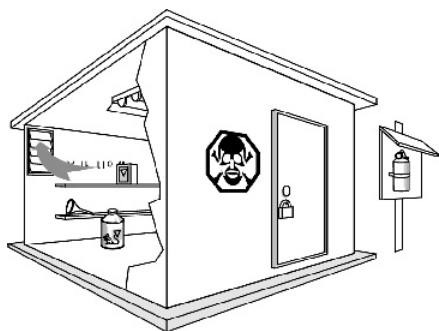
Transporting Pesticides

You are responsible for transporting pesticides safely, whether you're taking them home from a supplier or taking them to the field. Under the *Transportation of Dangerous Goods Act* (TDG), you must do the following:

- Ensure containers are not punctured, broken or upset while being transported. Be especially careful with liquid pesticides.
- Prevent contamination. Never transport pesticides with food, animal feed, fertilizer, clothing or household goods.
- Don't transport pesticides in a truck with a wooden bed or box liner. Wood will absorb spilled pesticides and contaminate future loads of grain or livestock. Use a vehicle with a metal box or place pesticide containers in a metal or plastic storage container.
- Never leave pesticides unattended. You are responsible for accidental poisonings.
- If you are transporting dangerous goods more than 100 km in a vehicle licensed as a farm vehicle, you must obtain the proper documentation, training and attach the appropriate TDG placard to the vehicle. <http://www.transportation.alberta.ca/Content/docType272/Production/agricultural.pdf>
- Check and secure containers before you move them. Make sure caps and plugs are tightly closed and clearly labeled.
- Provide proper ventilation. Never transport pesticides in the truck cab or in the car. Don't let people ride with the pesticides. Harmful fumes may escape. Spills or residue from previous spills may cause injury.
- Protect paper or cardboard containers from rain.
- Carry personal protective equipment and spill cleanup equipment in the vehicle, in case of a spill.
- Transport containers in a secondary containment to catch any spills or leaks.

To minimize risk and personal liability, request delivery to the farm whenever possible.

Storing Pesticides



Proper storage of pesticides protects people, animals and the environment. It also lengthens the shelf life of your pesticides.

Store pesticides in a shed, room or locker which meets the following requirements.

Pesticide Storage Requirements

- Located away from wells, ditches or bodies of water. Avoid coarse-textured soil (sandy or gravel based) or areas that may flood. The minimum distance from a well is 90 m, and the minimum distance from surface water is 30 m
- A secure building that can be locked when unattended
- Well ventilated to the outside with appropriate vents or exhaust fans.
- The room or building is not adjacent to an area occupied by people, livestock or an area where food is stored or processed
- Warning sign on the entrance or cabinet door
- Used exclusively for storing pesticides
- Shelving made from metal or other non-porous material that can be easily cleaned
- No floor drains.

For storing a large amount of pesticide or products that require heated storage, consider the following:

- When building a pesticide storage facility, use fire-resistant material with a sealed concrete floor and metal shelves. Wood and unsealed concrete absorb pesticides and are impossible to clean. If you must use wooden shelves, cover them with heavy plastic or use a commercial sealant.
- Ensure your storage shed is well lit and insulated to protect pesticides against temperature extremes that may damage them. Some liquid pesticides are destroyed by freezing.
- Electrical wiring, furnaces and other equipment that produces heat or sparks should be rated as explosion proof.

Keep items required to respond to a spill or emergency close to, but not in, the storage area.



Emergency Equipment

Use the checklist to ensure you have the equipment to respond to an emergency.

- Fire extinguisher
- First-aid kit
- Spill clean-up kit
- Personal protective equipment.

Pesticides present special dangers to livestock and children. Pesticide storage should be constructed to resist fire and spills. The storage facility must be secure and sturdy enough to resist damage by livestock or people attempting to break in.

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Storage Procedures

- Read pesticide labels for storage instructions.
- Store in original containers with original labels. If you must use a different container, label it with the original label. Never leave a pesticide container without a label unless it has been rinsed and set aside for immediate disposal.
- Never store pesticides in bottles or containers that people, especially children, may recognize as normally containing food or drink.
- Ensure that there is no cross contamination between pesticides. For example, do not store dry formulation pesticides next to liquid pesticides. If the liquid pesticide begins to leak, it could contaminate the dry product.
- Never store pesticides near livestock, food, animal feed, wells, water supplies, seeds, fertilizers or in your home.
- Close containers not in use. Dry formulations cake when wet. Put open bags of wettable and soluble powders, dusts and granules in sealed plastic bags or other suitable containers.
- Store containers off the floor and regularly check them for leaks, rust and corrosion. If a leak occurs, place the damaged container inside another or transfer the contents to an empty container. Attach a new label to the new container. Copies of labels can be obtained through your pesticide vendor or online from the manufacturer's Canadian web site.
- Keep an inventory of pesticides being stored in a separate place. Use it in the event of an emergency, such as a fire.
- If a pesticide has been rendered unusable for reasons such as age, contamination, frost, etc., it must be treated as toxic waste. For information concerning the disposal of hazardous wastes, contact the Environmental Services Association of Alberta at 780-429-6363 or 1-800-661-9278

Storage Checklist

Check those areas you need to improve.

- Check labels for storage instructions.
- Label all containers if not stored in original container.
- Separate herbicides from other pesticides and keep dry formulations separated from liquid formulations.
- Locate the storage area away from bodies of water and wells to prevent contamination.
- Locate the storage area away from other buildings in case of fire.
- Use fire-resistant building materials with a sealed concrete floor and metal shelves for the storage area.
- Protect pesticides from temperature extremes.
- Provide a fire extinguisher, first-aid kit, spill kit and personal protective equipment close to, but not in, the storage area.
- Check for leaks, rust or corrosion on pesticide containers.

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- Keep an up-to-date inventory in an area away from the storage area, so that in case of fire the inventory can be provided to the fire fighters.
- Lock the storage shed.
- Ventilate the storage shed to the outside.
- Post a warning sign on the storage shed.
- Store containers away from direct sunlight.
- Keep emergency phone numbers handy.
- Store combustible materials away from heating systems.

Mixing Pesticides

There are several basic steps in mixing pesticides:

- Calculate how much pesticide you need.
- Open the container.
- Pour the concentrate into a measuring container.
- Pour the measured concentrate into the sprayer.
- Agitate the mixture.

Mixing pesticides is a hazardous operation that can result in accidental spills and splashes and the inhalation of dust. Remember, you are handling a full-strength pesticide at this stage and should protect yourself by wearing personal protective equipment that is in good working order, properly fitted and of the correct type, as stipulated on the label.

Errors during mixing or malfunctioning equipment may cause environmental contamination and damage to crops or livestock.

Before Mixing

Carefully follow the label instructions and re-check your calculations before mixing. Protect yourself as indicated on the label, and make sure the equipment is the right size and type for the job. Have clean water, a first-aid kit and spill cleanup material ready. Use kitty litter, sawdust or even soil to soak up spills.

Select a Mixing Site

Before you open any containers, select a mixing site:

- Prepare spray solutions outside and at least 30 metres away from dugouts, streams, wells, irrigation canals and drainage ditches.
- Choose an area where a spill or overflow will not contaminate a water supply.
- Keep other people, livestock and pets away.

When you select a mixing site, consider a water source. If you are drawing water directly from a body of water into the sprayer, a backflow prevention device must be installed in the system to prevent pesticide contaminated water from flowing back into the water body should the pump stop functioning.

Possible hazards include:

- Accidental spill of a container and contamination of the water source
- Tank overflows and spray solution contaminates the water source
- The pump stops and pesticide is siphoned back into the water.

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Pour Pesticides

Use the following precautions when you pour pesticides:

- Hold the container below eye level to reduce the chance of splashing pesticide in your eyes or face.
- Don't tear open bags. This causes dust to "puff up" which you might inhale or get in your eyes. Cut off the top of the bag with a knife or shears.
- Measure accurately; don't guess.
- Mix only the amount you plan to use immediately.
- Label weight scales, measuring cups, pails and other utensils "for pesticide use only." Lock them in the pesticide storage area when they are not in use.

Add Pesticides to Sprayer

There are several basic steps involved when adding pesticides to the sprayer:

- Fill the sprayer with half the water needed
- Turn on the agitator
- Add the pesticide
- Add the remainder of the water.

Using this method prevents pesticides from settling on the bottom. To prevent overflow, never leave a sprayer that is being filled unattended.

Triple-rinse empty pesticide containers, measuring cups and mixing equipment. Pour all rinse water into your sprayer. Puncture the empty, rinsed pesticide containers. Remember to replace caps, close bags and return containers to the storage area if not empty.

Note: If you splash or spill any pesticide, stop and clean up immediately. Remove any clothing that has been contaminated and wash your body thoroughly. Follow the first-aid procedures if necessary and clean up any spilled pesticides.

All personal protective equipment, mixing equipment and spray equipment, including pumps, tanks, hoses and tractors, are probably contaminated with pesticides.

Clean Up Checklist



Use the following checklist to ensure your safety.

- Wash your gloves and other personal protective safety equipment. All pesticides will eventually penetrate the equipment if left on it long enough. Clean it up at least 30 metres away from water sources, and wear protective gear.
- Clean equipment such as controls, steering wheel and handles. Upon completion of cleaning equipment, remove and clean personal protective gear. The last thing to wash is your gloves. Wash them first while they are on your hands; remove gloves and wash them again to clean the inside.
- Take a bath or shower as soon as possible and before eating or drinking.
- Wash your hair thoroughly and clean under your fingernails.
- Change into clean clothes.

The longer a pesticide remains on your skin, the greater the chance it will be absorbed into your body.

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Note: Empty domestic pesticide containers should be rinsed and drained, then disposed of with regular household trash.

- Use clean clothes every day. A small spill on yesterday's clothes may seem unimportant, but wearing the same clothes for several days without laundering increases your exposure and risk.
- Do not wear anything that cannot be washed. Leather belts, watch bands, cloth caps, contact lenses, leather boots and leather gloves leather cell phone or electronic device holders absorb and hold pesticides; they cannot be cleaned.

Pesticide Disposal

Empty Pesticide Containers

Dispose of empty pesticide containers at pesticide container disposal sites only after you have triple rinsed each container to remove residues and punctured the container. Contact your local agricultural fieldman at any municipal or county office for the location of pesticide container disposal sites. Container sites are also listed online at: <http://www.environment.alberta.ca/1675.html>.

Containers must be cleaned as soon as they are emptied for the following reasons:

- It minimizes hazards to people and the environment.
- It is difficult to remove pesticide residues from the container after they have dried in the container.
- The rinse water can be put directly into the spray tank or on the application site to minimize disposal problems.

Refillable Containers

Where possible, refillable containers should also be triple rinsed; however, they should not be punctured if they are to be taken back to the vendor for refilling.

How to Triple Rinse

To ensure your containers are clean before disposal, follow these steps:

- Drain empty pesticide container into the spray tank.
- Fill the container 10 percent full with water, replace the lid and shake or roll the container so all the inside surfaces are well rinsed.
- Drain the contents into spray tank.
- Repeat procedure two more times.
- Puncture the container so it cannot be used for any other purpose.
- Take empty container to disposal site.

or

- Pressure-rinse pesticide containers with a pressure rinser. Thrust it through the bottom of the container while attached to a water hose. Rinse for at least 60 seconds into the spray tank.

The best opportunity to rinse containers is when you fill the sprayer. Put the rinse water into the spray tank. At any other time, rinse water presents a serious disposal problem.

What Does Triple Rinse Accomplish?

Containers that are not cleaned are hazardous to workers who pick them up and crush or shred them for transport to the recycler. Unrinsed containers

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contaminate the recycling plant and may result in recyclers refusing to accept pesticide containers.

Rinsing is the key to recycling and only you, the farmer, can make it happen. Workers assume punctured containers are properly triple rinsed. Don't deceive them by puncturing unrinsed containers. This also contaminates your truck and the collection site.

In addition, leaving unrinsed containers lying around is hazardous for livestock, children and pets. Empty containers that are left near dugouts and bodies of water can cause runoff and contamination.

Surplus Spray Mix

Avoid mixing surplus spray solutions by accurately measuring the area to be treated (excluding water bodies or sensitive areas), calculating rates and calibrating the equipment properly. Surplus spray solution presents a disposal problem. Handle diluted pesticide solutions, leftover spray and rinse water in any of the following ways.

- Spray on compatible crop land. You may choose a low rate if no control is required.
- Re-spray treated areas if you will be able to stay within the maximum application rate. Exceeding the recommended rate may lead to problems with illegal pesticide residues in the harvested crop or crop damage or residues remaining in the soil and affecting next year's crop.
- Store in appropriate clearly labeled containers (product label, warning sign, concentration of the mixture, date it was prepared) for later use.
- As a last resort, call Alberta Special Waste Management Association.

Surplus Pesticide Concentrate

Reduce surplus pesticide inventory by buying only enough to use in one spray season. Take an accurate inventory before purchasing more pesticides. Mark the purchase date on each pesticide container. The majority of pesticides retain their effectiveness for two or more years if stored properly. This requires cool (not freezing) temperatures and dry storage conditions.

Take steps to safely dispose of those pesticides that cannot be used or are not required. It is sometimes possible to return unused pesticides to the supplier if the pesticide is still in its original container. If the local supplier is not willing to accept surplus pesticides, your other option is to use the product on your farm for a labeled use or find another farmer who can use the product in an appropriate manner. Product should never be sold or given to an acreage owner or someone living in a residential area.

If you have no labeled use for the product, contact Alberta Recycle Information Line (1-800-463-6326) for further information on the proper disposal of pesticide concentrates.

Handling Pesticide Soiled Clothing

- Remove contaminated clothing and equipment outdoors.
- Handle soiled clothing and equipment with unlined, nitrile or neoprene gloves.
- Remove pesticide granules from cuffs and pockets outdoors. Shake them into the garbage; don't get them near ornamental plants.
- Discard any garment saturated with chemical concentrate.
- Temporarily store clothing in a disposable plastic bag before washing.

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- Discard disposable coveralls by placing them in a plastic bag and taking them to a landfill.

Washing Pesticide Soiled Clothing

- Use chemically resistant gloves to handle pesticide soiled clothing.
- Wash clothing daily, after each use.
- Wash separately from regular laundry.
- Pre-treat with stain removal product if an emulsifiable concentrate (EC) formulation is used, and pre-rinse on the pre-soak cycle of the washer.
- Use hot water setting.
- Use full water level and normal cycle.
- Use extra heavy duty detergent as recommended for heavily soiled clothing.
- Avoid overcrowding washer.
- Repeat the wash procedure.
- Clean the washer after use (run an empty washer through full cycle with hot water and detergent).
- Line dry to prevent contamination of dryer and to increase the chemical breakdown of pesticide residues.

Personal Protective Equipment Care

- Clean safety equipment daily after each use.
- Use hot soapy water to wash hard hat, goggles, face shield, respirator, gloves and boots.
- Wash the respirator facepiece only (avoid getting the charcoal wet). Remove the pre-filters and cartridges if possible. Replace cartridges when you detect pesticide odor during wear. Replace unused cartridges every year.
- Store the clean respirator and cartridges in a sealed plastic bag to prevent charcoal from absorbing vapors.
- Always wash gloves after handling pesticide concentrate and before removing them.
- To remove gloves, peel glove off by holding the cuff. Hold it wrong-side out in the ungloved hand as you remove the other glove. Both gloves will have contaminated surface to the inside.
- Store contaminated gloves safely (for example, plastic bag) until cleaning or disposal.
- Wash gloves inside and out after daily use. Check for cracks, swelling, discoloration, holes and rips. Replace them if any deterioration has occurred.

Do not store personal protective equipment in the pesticide storage areas or with regular clothing.

Storage of Personal Protective Equipment

- Store in cool dry area to extend the life of protective clothing.
- Keep waterproof clothing (gloves, boots, etc.) away from sunlight to extend life.
- Keep respirators and their extra cartridges in a clean airtight container as the cartridge will absorb all organic vapors including diesel or gasoline vapors, and odors from crops, vegetation, animals and humans.

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Review Checklist

Check your understanding of the material in Module 3.

- I understand the need to select appropriate personal protective clothing and equipment based on the toxicity of the pesticide and the type of application.
- I know how to dispose of pesticide containers
- I know what to do with surplus pesticide
- I know how pesticides need to be stored
- I am aware of the handling, washing and drying procedures for pesticide soiled clothing and equipment.

If you cannot check off the above items, review the appropriate section.

Personal Safety Improvements I Need to Make

Check the following personal protective equipment that you have in good order. Purchase any clothing or equipment you are missing.

- Hard hat—wide brimmed, no leather bands
- Coveralls—cloth, disposable or impermeable
- Gloves—unlined, nitrile or neoprene
- Boots—neoprene overboot or high rubber
- Safety goggles or faceshield
- Ear plugs—a supply of disposable
- Respirator and spare cartridge filters—charcoal filter
- Chemical resistant waterproof apron

Exercises

Exercise 3.1

Which of the following statements are incorrect?

- a. Pesticides must be kept out of the rain; therefore, it is a good idea to put them in the front of the truck on the passenger seat.
- b. Haul pesticides in a vehicle with a metal box or place them inside another container if they must be hauled in a wooden floored truck box.
- c. Loading some groceries onto a truck along with a few jugs of herbicide is not a problem as long as the jugs don't touch the groceries.
- d. When preparing a spray solution in the field, it is advisable to draw water from a tank, at least 30 metres away from any well or body of surface water.
- e. Keep all mixing and measuring equipment in the pesticide storage building and use it only for pesticides.
- f. Keep personal protective equipment in the same room as the pesticides, where it will be handy when needed.
- g. A dust mask can be substituted for a respirator when dealing with granular products or powders.
- h. Place the storage shed near a well or dugout so that it will be handy for washing up or diluting the spray.

Exercise 3.2

Use the Storage Checklist on page 3-10 to assess your storage facilities and practices. List any deficiencies below.

Exercise 3.3

Mark each statement True (T) or False (F).

- a. Mixing is the most dangerous stage of application because you are dealing with a concentrated product.
- b. An error at mixing can be much more serious than other calibration errors.

MODULE 3 SAFE HANDLING PROCEDURES

Exercise 3.4

Mark each statement True (T) or False (F).

1. When you transport pesticides, you are legally required to:
 - a. Pack containers securely.
 - b. Never transport pesticides with food, animal feed, fertilizers, clothing or household goods.
 - c. Lock up pesticides if you leave your vehicle.

2. Pesticide storage facilities should meet the following conditions:
 - a. Be locked when unattended
 - b. Be ventilated to the outside
 - c. Be entered only by authorized people
 - d. Have a warning sign posted at each entrance

3. Pesticide storage facilities should be:
 - a. Built out of fire-resistant material
 - b. Located away from work and living areas, wells, ditches and other water sources
 - c. Equipped with shelving that won't absorb spilled pesticides
 - d. Located near water sources for easy access in fighting fire

Exercise 3.5

Check the correct statements.

- a. The precaution section on a label includes information on personal protection.
- b. The label always mentions specific safety equipment needed.
- c. Always follow label recommendations for safe handling of pesticides.
- d. Reduce exposure to all pesticides whether the toxicity is high or low.

MODULE 3 SAFE HANDLING PROCEDURES

Exercise 3.6

Mark each statement True (T) or False (F).

- a. Wear protective clothing and equipment to minimize exposure.
- b. For a minimum level of protection when handling dilute, less toxic or granular pesticides, wear a hard hat, coveralls, unlined nitrile or neoprene gloves and neoprene boots or high rubber boots.
- c. Extra protection is required for mixing, loading and handling pesticide concentrate and highly toxic pesticides.
- d. Cuff gloves and wear over the sleeve.
- e. Wear pants over boots.
- f. Close shirt and coveralls at the neck to reduce exposure.
- g. A respirator may not be required for a less toxic pesticide.
- h. Wear a waterproof apron when handling all concentrated pesticides.
- i. Always follow the clothing and equipment requirements recommended on the label.
- j. Coveralls provide an extra layer of protection when worn over a long sleeved shirt and full length pants.
- k. Choose disposable coveralls that are recommended for pesticide use.
- l. Disposable coveralls can be laundered and reused.
- m. Always wear unlined nitrile or neoprene gloves when handling, mixing or pouring concentrate.
- n. A baseball cap is suitable when handling a powdered form of pesticide.
- o. Wear contact lenses.
- p. A dust mask is not a respirator.
- q. Disposable ear plugs protect the ear canal.
- r. Leather shoes, gloves and wrist watch bands absorb chemicals and prolong exposure of the body to pesticides.
- s. A close fit is necessary when wearing a respirator.

MODULE 3 SAFE HANDLING PROCEDURES

Exercise 3.7

Mark each statement True (T) or False (F).

- a. Skin can absorb chemicals from inadequately cleaned clothing and equipment.
- b. It is difficult to remove some pesticides from clothing and equipment..
- c. Clothing saturated with chemical concentrate should be washed twice.
- d. Wear unlined nitrile gloves when handling contaminated clothing and equipment.
- e. Contaminated disposable coveralls should be placed in a plastic bag and taken to a container collection site.
- f. Remove pesticide granules from cuffs and pockets outdoors.
- g. Use coveralls worn for handling pesticides for that use only.

Exercise 3.8

Mark each statement True (T) or False (F).

- a. Contaminated clothing should be washed separately from the regular family wash.
- b. Line dry clothing to prevent contamination of the dryer and increase the chemical breakdown of pesticide residues.
- c. Wash contaminated clothing daily.
- d. Pre-treat emulsifiable formulations with a stain removal product.
- e. Use hot water, full water level and normal cycle when washing contaminated clothing.
- f. Clean washer after use on the cold water cycle.

Exercise 3.9

Mark each statement True (T) or False (F).

- a. Gloves should be washed after handling pesticide concentrate.
- b. Place removable charcoal cartridges in a sealed plastic bag between wearing.
- c. Wash safety equipment daily.
- d. Replace gloves if swelling or holes occur.

Answers

Answer 3.1

a, c, f, g, h

Answer 3.3

a. True

b. True

Answer 3.4

1. a. True; b. True; c. True

2. a. True; b. True; c. True; d. True

3. a. True; b. True; c. True; d. False

Answer 3.5

a, c, d

Answer 3.6

| | | |
|----------|----------|----------|
| a. True | h. True | o. False |
| b. True | i. True | p. True |
| c. True | j. True | q. True |
| d. False | k. True | r. True |
| e. True | l. False | s. True |
| f. True | m. True | |
| g. True | n. False | |

Answer 3.7

| | | |
|----------|----------|---------|
| a. True | d. True | g. True |
| b. True | e. False | |
| c. False | f. True | |

Answer 3.8

| | |
|---------|----------|
| a. True | d. True |
| b. True | e. True |
| c. True | f. False |

Answer 3.9

| | |
|---------|---------|
| a. True | c. True |
| b. True | d. True |