

UF/IFAS Extension Hendry County

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Safety Precautions When Working with Pesticides

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Many pesticide accidents result from careless practices or ignorance.

It is important for applicators and pesticide handlers to learn and implement safe procedures when working with pesticides. As an applicator or handler working with pesticides you should always exercise safety precautions not only to safeguard your health but also to protect other people and the environment from pesticide injury.

Goals of This Module

- Learn proper safety precautions for before, during and after pesticide application.
- Understand the importance of cleanup measures.
- Learn how to safely transport pesticides
- Understand the need for personal protective equipment.
- Understand your legal responsibilities when using pesticides

Before Application

Before you begin to work with or apply pesticides, always be sure that all factors are favorable and you take the necessary safety precautions for protecting you, others, and the environment. You are well advised to refrain from applying pesticides if all the factors described below are not as they should be.

Many safety precautions should be taken before you actually begin applying pesticides. Many pesticide applicators are dangerously and unnecessarily exposed to pesticides while they are preparing to spray. Most pesticide accidents can be prevented by adopting informed and careful safety practices.

All pesticide users should keep thorough records for personal, crop, and economic protection. While regulations require that applicators keep specific records on pesticide applications; keeping careful records on previous applications can provide additional benefits such as choosing the most cost effective products and help you avoid the presence of illegal residues. Consistent,

detailed records will assist you in your pest control practices and guide you in future pest control programs. Careful documentation can also be an asset in any legal proceedings.

Plan Ahead

Always read the label on the pesticide container thoroughly before you begin to use the product. Make sure that you understand everything you need to know about the pesticide ahead of time so that you use the product correctly and responsibly. Carefully follow all the directions and precautionary advice on the label. Remember the label is the law and directions for use are not merely suggestions but legal requirements for use.

Be sure that you are prepared to deal with an accidental exposure or spill before you begin using pesticides. Be prepared for emergencies and know the first aid procedures for the pesticides you use. Always post emergency phone numbers. If you or any of your fellow workers feel sick, do not try to finish the job. Leave the treated area and seek help immediately. To prepare for accidental spills, have some kind of absorptive material available such as kitty litter, clay, activated charcoal, or sawdust to soak up spills or leaks. Hydrated lime should be available for decontamination of spill surfaces. Keep plenty of soap, detergent, and water or anything else suggested on the label for emergencies or cleanup. In case a change of clothing is necessary, have extra clothes or a protective suit available.

Finally, you should have an understanding of your legal responsibilities when you or your workers handle and apply pesticides. Do not guess about this or anything else about your work. If you have questions about pesticide safety, techniques involving pesticide use and disposal, emergency situations, or your responsibilities under the law, contact your state pesticide regulatory agency or your local Extension agent before you use pesticides.

Move Pesticides Safely

Carelessness in transporting pesticides can result in broken containers, spills, contamination and exposure. Once pesticides are in your possession, you are responsible for transporting them safely. Accidents can occur even when transporting materials a short distance. If a pesticide accident occurs, you are responsible. Do all you can to prevent a transport problem, but be prepared in case of an emergency.

The safest way to carry pesticides is in the back of a truck. Flatbed trucks should have side and tail racks. Steel beds are preferable since they can be more easily decontaminated if a spill should occur. Never carry pesticides inside your car, van, or truck cab. Pesticides may cause injury or death if they spill on you or your passengers or hazardous fumes may be released. Spills on upholstery or carpeting are nearly impossible to clean up, and may be a source of future contamination. Never leave your vehicle unattended when transporting pesticides in an unlocked trunk compartment or open-bed truck. You, and not your employer are legally responsible if curious children or careless adults are accidentally poisoned by unattended pesticides.

Children must never be allowed to ride on or near pesticides. Never transport groceries or livestock feed near pesticides. Secure all pesticide containers in such a way that they cannot shift, roll, or bounce around. All containers should be protected from moisture that might saturate paper and cardboard packaging or rust metal. Any spills in or from the vehicle must be immediately cleaned up, using correct procedures. If a spill is large, the appropriate regulatory authorities must be notified.

Some pesticides are designated “hazardous substances” by the Department of Transportation (DOT). Certain guidelines apply to the transportation of pesticides that are on DOT’s list of hazardous substances. For example, shipping papers must be carried in the truck cab if designated pesticides are moved on the highway. The truck may also be required to display a sign (“placard”) which indicates that hazardous substances are being transported. The state DOT office should be contacted for detailed information on which pesticides are on the hazardous substance list, and what rules apply to them during transportation.

Personal Protective Equipment

The need for personal protective equipment depends mainly on the pesticide being handled. You may wear ordinary work clothes (long sleeve shirt, long pants shoes and socks) while using pesticides of low toxicity, but it is a good idea to reserve one set of work clothes specifically for this purpose. More toxic chemicals may require coveralls worn over another layer of clothes, or chemical-resistant

protective suits and other protective gear such as gloves, goggles and respirators. In the Worker Protection Standards (WPS) for agricultural pesticides, the EPA defines a material as “chemical resistant” if it shows no measurable movement of pesticide through the material during use. Always consult the label to determine exactly what personal protective equipment is required.

Personal protective equipment requirements are listed on pesticide labels. These requirements are based on the toxicity, route of exposure, and formulation of that pesticide. When working with moderately or highly toxic pesticides, wear coveralls over another layer of clothes or a chemical-resistant protective suit, chemical-resistant gloves, and chemical-resistant footwear to prevent exposure of the skin to the pesticide. If the pesticide is an eye irritant, wear goggles, shielded safety glasses, or a face shield. If conditions are such that ordinary coveralls will wet through, use a chemical-resistant suit or apron. Synthetic rubber boots protect against liquid and dry formulations. Natural rubber boots are effective only for dry formulations. Remember you can always opt to wear more personal protective equipment than called for by the label.

The activity, the environment, and the handler will also influence the choice of protective equipment. The activity-related factors are type of activity, duration, equipment, and deposition pattern of the pesticide onto the handler. Mixing/loading procedures often require extra precautions when the pesticide is in concentrated form, but a closed mixing/loading system can reduce this risk. Airblast application more often results in greater applicator exposure than in other application methods, so additional precautions are advisable. Activities that deposit pesticides on the head or groin require protective head- or body-gear because these body parts absorb pesticides at a much faster rate than other body parts.

Wind increases the risk of outdoor pesticide application. When exposed to downward drift, wear a wide brimmed, chemical-resistant hat that protects the face and back of the neck. Consider wearing a face mask, shielded safety glasses, or goggles. Be aware that extreme heat and humidity can cause heat stroke and exhaustion. Other environmental considerations are terrain, proximity to public places, and open versus closed spaces.

As the pesticide applicator, you make the final decisions in the selection, use, and care of personal protective equipment. No one protective garment offers universal protection. Each pesticide use demands individual choices of protective equipment. Carefully read the pesticide label for protective equipment requirements and take additional precautions as indicated by the activity, environment, and your own personal needs.

Mixing and Loading

Protective gear is especially important when you mix and load pesticides in their undiluted, concentrated forms. Studies show that applicators and handlers are at a greater risk of accidental poisoning when handling pesticide concentrates. Pouring pesticide concentrates from one container to another is one of the most hazardous handling activities. That is why it is important that you wear protective clothing and equipment before you handle pesticides.

Read and carefully follow the label directions each time you mix pesticides. Even if you have used a pesticide before, read the label again. Pesticide labels change frequently. Each new container may have important new label information that must be followed. Carefully choose the pesticide mixing and loading area. It should be outside or in a well ventilated area away from other people, livestock, pets, and food or feed. It is best to mix and load pesticides on a concrete pad where spills are easily cleaned up. Pesticides should not be mixed in areas where a spill or overflow could get into a water supply. Handling areas are frequently located near a pond or stream bank. In such a situation, grade the area to slope away from the water. If you or your workers must work indoors, or at night, work in a well-ventilated area with good lighting. If possible, do not work alone, especially when using highly toxic pesticides. It is a good idea for anyone handling extremely poisonous materials to talk to, or make eye contact with another person every two hours.

It is important to measure pesticides carefully, making sure to mix them in the appropriate proportions. Check labels for incompatible mixtures. Remember, pesticides should be kept in their original containers so that the label directions and precautions are always with the toxic material. It is always a good idea to label all items that are used for handling pesticides (measuring utensils, protective equipment, etc.) to prevent their use for other purposes.

Plan your application so that you mix and use only what is needed. Do not use any more than the amount listed on the label. Using more product than the label recommends will not do a better job of controlling pests and is illegal. The overuse of pesticides may:

- raise the cost of pest control.
- increase the chance of illegal pesticide residues in treated foods.
- increase the possibility that pesticides may reach and contaminate groundwater.
- lead to the development of pesticide resistance.

Open pesticide containers carefully to decrease the possibility of accidental splashes, spills, or drift. Do not tear paper containers open, use scissors for safe, spill free

opening. Be sure to clean tools that are used for opening containers. To prevent contamination, always make sure opening tools are used only for pesticide-related work.

When pouring pesticides, always stand with your head well above the container and the mouth of the spray tank, so that you and your clothing do not get splashed. Never use your mouth to siphon a pesticide from a container. While you should not be applying pesticides when there is a strong wind, if there is any breeze, make sure that it is blowing away from you or from your right or left when you pour or mix these toxic materials.

Never leave a spray tank unattended while it is being filled, as it may overflow. Install anti-siphon devices on filler pipes and/or always maintain an air gap between the filler pipe and the tank. Close containers after each use to prevent spills. If a pesticide spills on the floor or ground, it should be cleaned up immediately. A pesticide spill can potentially cause great harm to others, as well as cause environmental contamination. Toxic quantities of some concentrated chemicals may remain in soil for many months or years.

Equipment

Carefully choose the correct equipment for applying your pesticides. Always use equipment properly and take good care of it. Before you begin using pesticide application equipment, check it thoroughly to be absolutely sure that everything is working properly. Calibrate your equipment so that you apply the exact amount of pesticide necessary. Be sure there are no leaks in hoses, pumps, or tanks. Check for loose connections and worn spots in hoses that could leak or burst. One way to check for leaks is to operate the equipment at normal pressures with clean water before filling with pesticide mixture. If belts, pulleys, or drive chains are exposed, put guards around them so that you, children, or other people cannot be injured. The spray tank should have a tight lid so that neither you nor others will be splashed and spray materials will not leak onto the ground.

Before application

Before making any application, make sure that the treatment area is clear of all unprotected people.

While you are applying pesticides there are many safety precautions to follow. You are responsible for the protection of not only yourself but other people, domestic animals, and the environment as well. You cannot afford to be careless!

During Application

Avoid Exposure

Even moderately toxic chemicals can be poisonous to you when they are used day after day. Pesticides can contaminate clothing and may soak through to your skin.

Do not work in drift, spray, or runoff unless you are properly protected. If pesticides spill on your gloves, be careful not to wipe your hands on your clothing. Work in pairs when you are dealing with hazardous pesticides. Handlers of highly toxic pesticides should try to make visual or voice contact with another person every two hours. Carefully supervise your employees to make sure that all safety precautions are followed.

Never blow out clogged hoses or nozzles with your mouth. Use a nylon bristle brush for clearing out these equipment parts. Be sure that any tool that is used for this kind of job does not get used for anything else!

Wash your hands and face thoroughly after you use pesticides and before you do any other activity. Never eat, drink, or smoke when handling pesticides. Chemicals can get transferred from your hands to your mouth during smoking. Don't smoke in recently treated areas. Smoking with pesticide-soiled hands can also be extremely dangerous if flammable chemicals are being used.

Not all labels will state it, but as a pesticide applicator, you are required by law to prevent direct or indirect exposure of workers and other persons. Keep children, unauthorized persons, and pets out of the area to be sprayed and at a safe distance from sprayers, dusters, filler tanks, storage areas, and/or old pesticide containers.

Avoid Sensitive Areas

Avoid spraying near houses, schools, playgrounds, hospitals, bee hives (apiaries), lakes, streams, pastures, or sensitive crops. If you must spray near sensitive areas, never spray or dust outside on windy days. Even with low winds, always apply downwind from any sensitive area. Plan your applications for times when people, animals, pets, and non-target pests (such as honey bees) will not be exposed. Notify residents and beekeepers when you plan to spray in their areas and urge them to take appropriate precautions. Never spray directly into or across streams, ponds, or lakes without first checking with authorities regarding appropriate procedures or necessary permits. Completely cover or remove toys and pet dishes, as well as close all of the windows. Be sure that children and pets are not present in the area of the pesticide application. Avoid sensitive indoor areas such as infants' rooms, food preparation and storage areas, heating and air conditioning systems, and also be familiar with pet and fish tank locations.

Avoid Drift, Runoff, and Spills

Pesticides that fall anywhere but on the target area can injure people, crops, and the environment. Choose weather conditions, pesticides, application equipment, pressure, droplet size, formulations, and adjuvants that minimize drift

and runoff hazard. Spills can be avoided by taking simple precautions.

Avoid Equipment Accidents

Properly maintained and carefully used equipment contribute to safe pesticide application. Poor maintenance and careless use of equipment add to the hazard posed by pesticides.

- Be sure to turn off your machinery before making any adjustments or repairs on it. If someone else is doing repair work on equipment that has not been cleaned, warn them of possible hazards.
- Do not allow children, pets, or unauthorized people near the pesticide equipment. If you are working some distance from your equipment or at the end of a long spray hose, have someone keep watch near the sprayer so that no one gets injured by the machinery.
- Between jobs, pressurized tanks or systems (i.e. hand held sprayers) should be depressurized. Turn off main pressure valve on bulk containers and release the pressure remaining in your application wand.
- Once the tank is empty, release the pressure from your application equipment. Be sure to close the outlet valves. Always return equipment to appropriate areas for cleaning and storage when pesticide applications are completed.

Safety and caution does not end with the application of the chemical. Proper cleanup and safety measures are still necessary. Complete one job entirely before going on to the next.

Pesticide Spills

A spill is an accidental release of a pesticide. The spill may be minor, involving only small amount from an upset or leaking container, or it may be major, involving large amounts of pesticide or pesticide-containing materials such as wash water, soil, and absorbents. 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 spills should be cleaned up before the end of the work day to keep unprotected persons or animals from being exposed.

The first step in dealing with the spill is to protect yourself. Put on appropriate personal protective equipment before contacting the liquid or breathing the fumes. Check the label for necessary equipment. Next, stop the source of the spill. If a container is leaking, put it into a larger chemical resistant container. If the spray tank is overflowing, stop the inflow.

Isolate the spill site by keeping children and other unprotected people well back. Someone should be at the spill site at all times until the spill is cleaned up.

Contain the spill by keeping it from spreading or getting worse. Use containment snakes, soil or kitty litter to surround the spill to keep it from getting worse. For larger spills, use a shovel or other tools to make a dike of soil, sod or absorbent material. Keep the spill out of any body of water or any pathway that leads to water. Block it or redirect it.

Absorb liquid spills with absorbent materials such as sand, kitty litter, sawdust, etc. Prevent dry, dusty material from becoming airborne by covering with plastic or sweeping compound or lightly misting with water.

Clean up the spill by sweeping up absorbent material containing the pesticide and place it into a heavy-duty plastic drum or bag. Keep adding absorbent until the spilled liquid is soaked up and removed. Spills of dry materials should be swept up for reuse if possible.

Decontaminate the spill site as well as you can. Do not hose down the site with water. If it is on a sealed surface, use water and a detergent to remove residues. Do not allow any wash solution to run off the site being cleaned. Place fresh absorbent material over the wash solution and sweep up and place in drum or bag for disposal as excess pesticide.

If a spill occurs on a public road, call the police for traffic control, call CHEMTREC for information on “how to handle it,” and call the Florida Department of Agriculture and Consumer Services Pesticide Compliance Program (850-617-7850). You may need to report spills in excess of certain amounts of active ingredient to the State Warning Point (850-413-9911).

Storage and Disposal

Try to use all the pesticide in your tank. Left over spray solution should be applied on other approved crops or sites at the recommended dosage. Clean the equipment and put it away immediately after use to prevent accidents.

Sometimes existing building or areas within existing buildings may be used for pesticide storage. However, if large amounts of pesticides will be stored, it is better to build or dedicate a building exclusively to pesticide storage. Choose a storage site where water damage is unlikely to occur. Make sure water sources won't be contaminated by runoff from the storage site. The building or room should be dry, well-ventilated and well-lighted. The storage facility should be securely locked to keep out unauthorized people. Post signs on doors and windows to alert people that pesticides are stored there. Post “No Smoking” signs. Storage areas should have an immediate supply of clean water for decontamination of people. If running water is not practical, provide a sealable container with clean water.

Store pesticides in the original container with the label in sight and legible. If the label is destroyed or damaged, request replacement labels from the pesticide dealer immediately. Keep containers tightly closed. Inspect containers regularly for tears, splits, breaks, leaks, rust, or corrosion. If a container is damaged, put on protective clothing and take immediate action. Use completely all contents on labeled site, transfer to another container that held the same pesticide, or put into another container that can be tightly closed and put the label on the new container.

Do not store pesticides with food, animal feed, seeds, and farm animals. Do not store personal protective equipment (PPE) with pesticides. Store volatile pesticides separately from other types of pesticides. Keep containers away from windows, sunlight or any source of heat.

Control the temperature to prevent freezing or overheating. Some pesticides are affected by temperature extremes. Check the label for storage temperatures.

Keep an up-to-date inventory of pesticides kept in the storage area. Mark each container with the date of purchase and use older materials first. Do not store unnecessarily large quantities of pesticides for long periods of time. Purchase only as much as you will need for a season or year at most. If you store large quantities of 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. Inform the fire department of the types of pesticides regularly stored there and give them a floor plan of the facility and work with them to develop an emergency response plan.

Do not leave pesticides or pesticide containers unattended out in the field or at the application site. Be sure to account for every container used. Safely dispose of empty containers. Do not reuse pesticide containers for any purpose. Never give them to children for any use. Partially used pesticides should be stored in their tight original containers in a locked building. Keep children and uninformed people away from the storage area.

Clean Up

Mixing, loading, and application equipment must be cleaned as soon as you are finished using them.

In Florida, rinse water can be used as make-up water in the spray tank and can be legally applied to approved crops or sites at the recommended dosage

Cleaning should be done in a special area that has a wash rack or concrete apron with a sump for catching contaminated wash water. The best way to dispose of wash water containing a registered pesticide is to use it as directed on the label. Collect the contaminated water and use it to dilute the pesticide or a compatible pesticide if

possible. Waste from equipment cleanup must be kept out of water supplies and streams.

It is extremely important for pesticide equipment to be properly cleaned between applications. Accidental injury or death of sensitive plants or animals may occur from applications that are made with slight residues of previously-used pesticides in equipment. If spray equipment is used to treat multiple crops on a mixed vegetable operation, residues left in the tank from a previous application may also result in illegal residues on crops sprayed subsequently if the chemical used previously was not labelled for the crop being sprayed.

Be sure to clean the inside and outside of the equipment, including the nozzles. This job should only be done by trained persons who are wearing proper personal protective equipment. The outside of your equipment should be washed so that people touching it will not be exposed to pesticides. The inside must also be cleaned so that unwanted chemical mixing does not occur.

At the end of each work day pesticide applicators and handlers should shower thoroughly. Wash your body and hair thoroughly with soap and water. Remember to scrub your nails. Place pesticide-soiled protective equipment in a designated place away from people, pets, and the family laundry. Launder washable clothing separately every day this applies to regular work clothes worn under protective coveralls, as well as to garments directly exposed to pesticides. Disposable or limited-use garments should not be reused. Discard according to applicable federal, state, and local regulations.

Disposal of Containers

Empty paper or plastic pesticide containers must either be shaken clean if they held dry pesticide formulations, or triple or pressure rinsed if they held liquid pesticide formulations. Use one of the following disposal options for the empty, clean containers.

Sanitary Landfill

Empty bags and rinsed containers may be taken to sanitary landfills for burial if the landfill operator accepts pesticide containers and local regulations allow landfill burial.

Open Burning

Open burning of rinsed containers and empty bags is allowed in open fields if:

- you are the property owner, the owner's authorized employee or caretaker, or a commercial pesticide applicator hired by the owner or caretaker
- the product label allows burning of the empty container

The following factors must be considered when burning containers:

- burn only one day's accumulation of containers (500 lb. maximum)
- the open burning must not produce smoke, soot, odors, visible emissions, heat, or flame to such a degree as to create a nuisance
- the open burning must be 200 feet or more away from any farm workers or occupied buildings and 100 feet or more away from any public road
- containers may be burned between 9 A.M. and one hour before sunset
- the person responsible for burning must be in attendance at an upwind location until all flame and smoke have dissipated
- the open burning is enclosed in a noncombustible container or ground excavation covered by a metal grill

Wash Pesticide-Soiled Clothing

Pesticide contaminated clothing should be washed separately from the family laundry. Spray clothing should be changed and washed daily. The pesticides on your clothes could harm other people who touch them. Keep pesticide-soiled clothing away from the family laundry and warn the person who will be washing your spray clothes of possible dangers. The person doing the laundry should wear chemical-resistant gloves. Do not allow children to play in or near the contaminated clothing. Do not dry-clean pesticide-contaminated clothing.

The recommended procedures for cleaning pesticide-soiled clothing for reuse are given on the following page:

- Air. Hang garments outdoors to air. Sunshine and ventilation aid in the breakdown of certain pesticides. Do not hang contaminated garments with uncontaminated garments. Do not hang contaminated garments close to residences or in areas frequented by people or pets.
- Pre-rinse. Use one of three methods: 1) hose off garments outdoors in an area away from people and pets, 2) rinse in separate tub or pail kept for that purpose, or 3) agitate in an automatic washer.
- Pretreat. Rub a heavy-duty liquid into the heavily soiled areas of the pesticide-contaminated garment.
- Washer load. Always wash garments separately from family wash. Pesticides can move from contaminated clothing to other clothing, to equipment, or to the unprotected hands of the person doing the laundry. Wash garments contaminated with the same pesticide together.
- Load size. Wash only a few garments at a time.
- Water level. Use full water level.
- Water temperature. Use hot water, 140°F or higher.
- Wash cycle. Use a normal 12-minute wash cycle.

- **Laundry detergent.** Use a built heavy-duty laundry detergent. Built detergents are specially formulated to contain additional cleaning agents that control water hardness, increase and maintain alkalinity of wash water, react with oily soils, and suspend particulate soil. Built detergents are needed for pesticide-contaminated clothing because the pesticide is often mixed with other soils. Polyphosphates are the preferred builder because they clean well without forming a precipitate that adheres to the clothing. Where phosphates in detergents are prohibited, as in New York State, sodium carbonate, sodium aluminosilicate, and sodium nitrilotriacetate may be used as builders. Use the amount recommended on the package; use more for heavily soiled garments or hard water. Remember to dissolve powdered detergent before adding the clothing to the washing machine.
- **Rinse.** Use two full warm rinses.
- **Rewash.** Wash contaminated garments two or three times before reuse for more complete pesticide removal.
- **Dry.** Hang outdoors to avoid contaminating dryer and to encourage further dissipation of the chemical.
- **Clean washer.** Run a complete, but empty cycle. Use hot water and detergent.

Entering a Treated Area

Unprotected people should wait until the proper time to enter an area that has had a pesticide application. The restricted entry interval is the period of time that should pass between a pesticide application and returning to a treated area. Entry restrictions may be found on pesticide labels. Restricted entry intervals (REI) are one type of entry restriction. Do not allow workers, children, or other persons to reenter the sprayed area until this time has passed. When no restricted entry times are stated on the label, use good judgement in allowing people to return to treated areas or

structures. Always wait at least until sprays dry, dusts settle, and vapors disperse. If you must reenter an area early after spraying:

- Be sure to wear all the necessary personal protective equipment required under the early entry provisions of the label.
- Do not touch treated surfaces.
- Be sure to have decontamination water nearby and know how to use it.

Some highly toxic pesticides (organophosphates and carbamates) have legally specified entry restrictions of 24 or 48 hours. These time periods are listed on the pesticide labels. Some states have set even longer reentry times for some pesticides because of particular climatic conditions and other special hazards that exist in their areas.

Carelessness causes injury and death. Protect yourself, others, and the environment by using care and exercising common sense. Learn and practice safe procedures when working with pesticides, it's for your own good!

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