

# UF/IFAS Extension Hendry County

Author: Gene McAvoy, Extension Agent IV Emeritus

## Pesticide Storage – Article

Program ID – 002677 – expires 3/27/2026

Storing pesticides properly protects human and animal health, safeguards wells and surface waters, and prevents unauthorized access to hazardous chemicals. Proper pesticide storage and inventory practices will prolong the shelf-life of pesticides and make it easier to track your pesticide usage so that you can plan purchases for future years.

Your job is not finished until the pesticides, containers, and your equipment have been put away properly. While you are cleaning up and putting away the pesticides, containers, and equipment you should wear all the personal protective equipment you used on the job. Consider wearing gloves and other protective equipment, even if they weren't recommended on the label. Spills and accidental contamination often occur during storage procedures.

### Goals of This Chapter

- Learn how to read the label to find information on storing pesticides properly
- Know how to choose the best site for pesticide storage
- Understand how to properly arrange a storage area for pesticides.
- Understand the importance of handling, storing, and disposing of pesticides properly.
- Be familiar with safety procedures to protect yourself and others when storing pesticides
- Learn what to do in case of a pesticide spill.
- Protect your operation against theft and other security threats.

Reducing the amount of pesticide you store lowers the risk of chemical fires, explosions, or spills that contaminate well water, surface water or the soil. Make every effort to limit storage by buying only the amount of pesticide that you need for a specific job or for the current growing season.

In addition to safety concerns, storage of large amounts of pesticides on site is a tempting target for thieves.

The pesticide label is the best guide to storage requirements for every pesticide product. The Safety Data Sheet (SDS) provides additional information on normal appearance and odor as well as flash point, fire control recommendations, boiling point, and solubility.

Labels and Material Safety Data Sheets for most pesticides are available on-line at <http://www.cdms.net>, <http://www.agrian.com/labelcenter/results.cfm> and <http://www.greenbook.net>

### Pesticide Storage and the Law

According to Chapter 5E-2, Florida Administrative Code, "restricted use pesticides shall be stored and maintained in a secure manner, such that they are not easily accessible to unauthorized persons." Regular agricultural pesticide use inspections, conducted by inspectors from the Florida Department of Agriculture and Consumer Services (FDACS), use a form containing a three-item checklist regarding pesticide storage.

Keeping out unauthorized people, pets, and stray animals is an important function of the pesticide storage site. Whether the designated area is as small as a cabinet or as large as a building, it is important keep it securely locked.

### Storage Building and Location

Store large quantities of pesticides in a building designed specifically for that purpose. Store moderate amounts in their own room or storage cabinet within a building, but not in a basement or other area likely to flood. Make sure the room has a door that opens to the outside. Storage facility construction, or the renovation of an existing building for storing pesticides, requires planning. When choosing a storage site, check on local building, zoning, and fire codes and environmental regulations before construction. Have the local Fire Marshall or Fire Prevention Inspector review plans for construction.

More information on storage building designs, construction details and requirements, and engineering specifications for ventilation, heating, secondary containment, and site preparation can be found in the references at the end of this article.

If you are using a portable building for pesticide storage, use secure tie-downs to prevent movement or tipping from strong winds or flooding.

To protect the environment, the floor of the storage area should be made of sealed concrete, epoxy-coated metal,

glazed ceramic tile or another non-porous material that is free of cracks. This will prevent any spilled pesticides from seeping into the ground and will make cleanup of spills easier. Construct the floor with a continuous 2- to 4-inch lip to keep spills inside the building or the room. Floor drains must be sealed unless they are plumbed to a separate, external, holding tank. Any outflow must be captured and disposed of as hazardous waste. Use sealed floors -- metal, sealed concrete, epoxy-coated metal, wood or concrete, no-wax sheet flooring or other easily cleaned, non-absorbent material. Dirt or unsealed wooden floors are unacceptable.

Pesticide storage buildings should be located away from river and stream floodplains, ditches, ponds, and any other likely source of flooding. To prevent potential contamination of surface water or groundwater, carefully consider characteristics of soil and land surface when selecting a storage site. Avoid locating the storage facility near a stream likely to flood or where runoff water can be a potential problem, such as at the base of a slope. In certain situations, consider diking the storage facility or constructing a containment structure around it.

The site should be downwind and downhill from sensitive areas, such as houses, animal feeding stations or shelters, and food or feed storage facilities. Choose a location that is adequately separated from a wellhead and public water supplies. The US Natural Resources Conservation Service and the Florida Department of Environmental Protection recommend that pesticide storage and handling facilities are located a minimum of 100 feet from water sources.

Locate the pesticide storage facility where water damage is unlikely to occur.

The best practice is to maintain as great a distance as possible between any potential contaminant and water sources. Ideally, the storage building should be at least 50 feet away from other structures to reduce the risk of fire spreading from one building to another. Choose a site for the storage building that provides easy access for emergency vehicles.

Most pesticide labels call for storage in a “cool, dry” place. For your safety, always provide adequate ventilation and light.

Consult the pesticide label to determine the acceptable limits at which the storage temperature should not exceed or fall. As a rule of thumb, the temperature inside the storage area should not get below 40 F or over 100 F.

Some pesticides will freeze when they get too cold and the container may crack and leak. Freezing temperatures may cause some formulations to separate. Some pesticides expand when they get very hot. High temperatures also cause plastic to melt or become brittle and may cause

a buildup of pressure that may break glass containers or cause the chemicals to volatilize or spill out when the container is opened. Excessive heat may cause explosion or fire. Exhaust fans will reduce temperatures. Minimize fire hazards if you provide supplemental heating to the storage area.

## Humidity

Keep the storage area dry. Water or excess moisture can damage pesticide containers and their contents. High humidity may cause some dry formulations to cake, clump, breakdown, or dissolve, and release pesticide, making them unusable and dangerous and may cause slow-release products to release their active ingredients. Humidity also weakens paper and cardboard containers, and will eventually rust metal containers. It can also cause labels to peel off or become unreadable.

## Ventilation

The storage building needs constant ventilation to prevent the buildup of toxic fumes and to reduce humidity. Install louvered air intake vents low on the wall with the entrance door, or in the lower part of the door, and an exhaust fan or louvered air vents high on the opposite wall. This allows vapors to flow away from anyone entering or inside the storage unit and provides a continuous flow of air when the door is open. An exhaust fan removes fumes, excess heat, and humidity better than passive airflow. Vent exhaust air from the storage room directly to the outside. Do not exhaust the air from a storage area into other rooms. In some parts of the state, heat may be needed to maintain 40 F in the storage facility.

## Light

Make sure the storage area is bright enough so that pesticide labels can be read easily. Do not store pesticides in direct sunlight because exposure to sunlight may cause pesticides to break down and become ineffective and unusable.

## Secure the building and storage site

Only you and your authorized employees should have access to the storage area. Keep the storage unit locked at all times, except when it is under the direct supervision of a person authorized for entry. For extra security, install a fence around the storage area and lock the gate. Consider installing security lighting and an alarm system.

Basic Safety Guidelines:

- Never let anyone eat, drink, or smoke in the storage facility.

- Store pesticides in their original, labeled containers. Never store pesticides in milk jugs, soft drink bottles, fruit jars, or medicine bottles.
- Do not store pesticides with or near food, medicine, cleaning supplies, fertilizers, seed, or animal feed.
- Do not keep gasoline, kerosene, or other combustible materials with the pesticides.
- Make sure pesticides are not kept near operations which present a fire hazard, such as burning and welding.
- Do not leave any pesticide container in full sun or next to a heater.
- Store pesticides on metal shelves with a lip or on wood shelves covered with plastic or chemically-resistant epoxy paint. Leak-proof plastic trays on shelves work well. Do not store pesticides on the floor. Use pallets under large containers/bags.
- Keep the storage area neat and clean. Keep the area free of debris such as waste paper, rags, or used cardboard boxes, which may provide an ignition source. Clean up any spills immediately.
- Store dry formulations on the highest shelves. Store liquids and glass containers on the lowest level. This will prevent contamination in case a liquid container leaks.

## Warning/Emergency response signs

Place signs indicating “Danger Pesticides – Keep Out – No Smoking” at all storage entries. Consider posting signs in Spanish as well as English. Consider posting contact information on who to call for emergencies. This type of sign should have at least two emergency phone numbers – the owner should not be the sole contact in an accident. The National Fire Protection Association (NFPA) 704 standard provides a way to communicate the potential hazards of storing hazardous chemicals through the posting of a diamond shape or square-on-point shape sign. The sign addresses the health, flammability, instability and related hazards associated with short-term exposures that are most likely to occur as a result of fire, spill, or similar emergency. The 704 standard is applicable to industrial, commercial, and institutional facilities that manufacture, handle, or store hazardous materials. For more details on this standard, refer to the National Fire Protection Association website.

## Inventory

Keep an up-to-date written inventory of all stored pesticides, and save a copy in a place away from the storage area. The inventory can be very useful in a fire and flood emergency, in settling insurance claims, and in estimating future pesticide needs.

## Separation

Read the label or safety data sheet (SDS) to find out whether a product interacts with other materials and should be stored separately.

## Container Care

Make sure the label on every container is clearly visible and readable. Consider covering the original label with transparent wrapping tape to protect it. If the label gets fragile or is destroyed, mark the container in permanent ink with the trade name and common name of the product, the EPA registration number, the percentage of each active ingredient, the signal word (Caution, Warning, or Danger), and the use classification (restricted-use or general-use pesticide).

Replacement labels can be obtained from a pesticide dealer or manufacturer or on-line.

Always store pesticides in their original containers or in different containers that originally held the same pesticide and still have intact labels. Never use milk jugs, soft drink bottles, fruit jars, medicine bottles, fuel cans, or other types of non-pesticide containers to store pesticides. Using the wrong containers for pesticide storage is illegal and has resulted in serious poisonings because children, as well as adults associate the shape, size, and color of a container with its usual contents. Never lend or borrow any pesticide product in an unmarked or unlabeled container.

Write the date of purchase on all containers. Use older pesticides first so that a disposal problem is not created with pesticides stored longer than their shelf life. If you have questions about the shelf life of a product, contact the dealer or manufacturer. Conduct regular inspections of the storage facility and check containers for cracks, leaks, and deterioration. If a container is damaged, you may use the pesticide immediately for uses specified on the label, or transfer it using one of the following procedures and wearing appropriate protective clothing and equipment.

1. Transfer the pesticide into another container that originally held the same pesticide and that still has its label.
2. Transfer the pesticide to a sturdy container that can be tightly closed. If possible, transfer the label from the damaged container to the new one, or make a temporary label (see minimum label requirements listed above) until you can get a new one. Never use a food, feed, or drink container.
3. Place the damaged container, and its contents, into a larger liquid-proof container. Make a temporary label until you can use the pesticide or dispose of it properly.

---

## Plan for Emergencies

In addition to keeping an up-to-date inventory of stored pesticides, it is a good idea to have a plan for handling spills, fires, explosions, or other emergencies. Make sure workers are trained on how to keep the storage area safe and secure, and how to respond to spills or other accidents. Post emergency telephone numbers nearby, and make sure workers know where these numbers are.

Stock each storage site with an immediate supply of clean water and soap in case of pesticide contact with skin. If running water is not practical, use a large sealable container with clean water. Change the water at least once a week so that it is safe to use on skin and eyes, and clean the container periodically. Keep an eye-wash dispenser immediately available for emergencies.

## Responding to Spills

Keep emergency supplies and personal protective equipment on hand nearby, but not in the storage building or room where it could become contaminated. You will need protective equipment to enter a storage area if a spill or other accident has occurred. Until you know the extent and type of spill or accident, take all precautions, using a respirator, gloves, eye protection, boots, and a protective suit to enter the storage area.

Keep spill clean-up materials nearby. A spill kit should include absorptive materials, such as non-chlorinated cat litter, vermiculite, or activated charcoal, a shovel, and a drum with a lid for storing contaminated material. Don't allow workers to take items from the kit for other purposes. A clean, empty pesticide container may be used to capture any pesticide that has not leaked from a broken container. Make sure this is labeled appropriately before returning it to storage.

Refer to the SDS for the types of materials that are needed to deactivate spills. Common decontamination materials include hydrated lime, lye, ammonia, bleach, or detergent. Do not mix ammonia with bleach. Contact CHEMTREC (Chemical Transportation Emergency Center, 1-800-424-9300) or the chemical manufacturer for information on responding to large spills.

Federal and state laws require reporting of spills involving pesticides that are regulated as Hazardous Substances or as Extremely Hazardous Substances. Not all pesticides meet these criteria. Pesticides that are on these lists have reporting requirements based on the amount of active ingredient spilled, referred to as the Reportable Quantity (RQ).

## Documents to Keep on File

Keep copies of your storage location map, storage unit floor plan, and current or seasonal inventory in a secure place away from the storage unit. Keep copies of labels and MSDSs for every chemical in storage.

## Work with Emergency Responders

Notify local fire departments or other first responders about the location and contents of your pesticide storage facility. You may be required to notify your Local Emergency Planning Committee (LEPC) about the contents of your storage building.

Large-scale commercial storage or restricted use pesticide storage facilities should have written contingency plans describing the procedures for managing fires involving pesticides. Update the plan yearly, and review it with your local Fire Department.

## Fire extinguishers

Keep a fire extinguisher that is approved for chemical fires nearby, or near each exit within the storage building. Read the pesticide labels to determine what type of fire extinguisher(s) you need. ABC classified extinguishers are appropriate for most pesticides. Fire extinguishers need to be inspected and maintained on a regular basis to ensure that they are in good operating condition.

Remember that it is sometimes safer to let a chemical fire burn itself out than to expose firefighters to pesticides or to contaminate large quantities of water. Let the fire fighter make this decision.

## Security against Theft

Theft of agricultural chemicals is common place in Florida and every year, millions of dollars' worth of pesticides are stolen from farms and groves around the state.

Growers should keep farm entrances and storage areas locked and maintain surveillance. Lock up all chemicals, they are essentially like cash money for a thief.

Some precautions that can be taken to avoid losses include:

- Locate chemical storage well away from access roads. Be sure that all entrances to your farm are secure – even trails through the woods accessible by off-road vehicles as some thieves are reportedly using on-line satellite maps such as Google Earth to identify building and alternative ways of entering properties via the “back way.”
- Perform a self-audit, review your operation and security procedures and make any necessary changes to tighten security.

- Request that chemicals be delivered on the days you need them and not before.
- Return excess chemicals to the chemical distributor. Not having a stockpile of chemicals in your shed you will decrease the opportunity for theft.
- Consider installing alarms or video cameras on chemical shed doors or windows.
- Buy only from reputable dealers and do not be tempted to buy “cheap” chemicals from unknown sources - you are only supporting a thief and you may be next.
- It is strongly recommended that all equipment – hand tools, power tools, be marked in a specific manner that could help identify your tools if they are stolen or lost. Also consider marking car/truck batteries in a similar manner.
- All chemicals should be secured daily, in a secure container or building. All padlocks should be mounted in a manner in which it is difficult to use bolt cutters to cut the padlocks.
- Growers may also want to consider video surveillance - various companies can help with this and security systems.
- Look out for your neighbor and report suspicious vehicles and activities to the Sheriffs’ Office.

You can remain anonymous and be paid a reward if your information leads to an arrest by calling Crimestoppers at: 1-800-780-TIPS

## Security Against Terrorist Threats

Since the Oklahoma City bombing and the terrorist attacks of September 11, 2001, farmers and managers of pesticide storage facilities have had heightened concerns about biosecurity and agroterrorism in the United States. Businesses that manufacture, reformulate, sell, distribute, transport, store, or apply pesticides have long known the mitigation steps for safety of their workers, customers, and communities. In today’s age, however, these efforts may not necessarily be enough.

Without effective security measures, a business dealing with pesticides may be vulnerable to both internal and external threats. Buildings, machinery, stored pesticides, and business information are all included in these threats. Protection of mobile pesticide application equipment, particularly aerial application equipment, should be taken into account as well.

Terrorists are unlike common criminals whose prime motivation is monetary gain. Terrorists have idealistic or political goals and will attempt to accomplish their mission with no fear of being caught. Their actions are carefully planned and coordinated, and attempted by skilled and

maybe armed individuals. Security precautions designed to deter theft will likely fail against terrorists.

## Questions to Ask of Your Establishment to Assess Risks

- What is the threat (theft, sabotage, attack)?
- How might illegal activities be carried out?
- Is the threat internal or external?
- Are containers of hazardous substances easily accessible?
- Is there the potential for siphoning from large storage tanks?
- Are unauthorized people allowed on the premises?
- Are unauthorized people escorted while on the property and do they sign in and out?
- Are background checks performed on employees?
- Are employees aware of the security risks associated with the storage of agrichemicals and other hazardous substances?
- Is there a potential for theft of electronic information that could result in security breaches?

### Recommended Considerations in Evaluating Pesticide Security

- Securing buildings, manufacturing facilities, storage areas and surrounding property: It is fundamental, but preventing intrusion can include elements such as fencing or other barriers, lighting, locks, detection systems, signage, alarms, cameras, and trained guards.
- Securing pesticide application equipment and vehicles: Consider using an authorization process for persons who have access to such equipment before their use.
- Aerial application equipment: The FBI has requested that aerial applicators be vigilant to any suspicious activity relevant to the use of, training in, or acquisition of dangerous chemicals and their application. Such activity includes, but is not limited to, threats, unusual purchases, suspicious behavior, and unusual contacts with the public.
- Protection of confidential information: As businesses, have grown more reliant on computers and communication technology, the need to secure these systems has grown. Efforts to include contingency planning for power losses, monitoring access ports, adherence to password and backup procedures, and maintaining access for authorized personnel only should be taken into account.
- Developing procedures and policies that support security needs: Even the best hardware and staffing budgets are only as effective as the procedures and policies that control their use.
- Effective hiring and labor relations are important to obtain and retain good employees who will support and follow safety precautions. For example, the hiring



process should ensure that pesticide handlers have all requisite training necessary to handle pesticides safely. Background checks of staff who have access to secure areas, particularly those areas where pesticides may be stored, are also necessary.

- Inventory management policies can help limit the amount of potentially hazardous pesticides stored on site, reducing the risks of accidental or intentional release or theft.
- Effective advance emergency response procedures can be critical. Business officials and employees need to have an understanding of how to respond and whom to contact in the case of an emergency.
- Establish a procedure for locking up the facility at the close of the business day.

## Suspicious Individuals

Maintain awareness of anyone demonstrating suspicious behavior, including those who:

- Seem unfamiliar with agriculture or agrichemicals. This can usually be determined by everyday conversation with someone who enters the business.
- Seem to be “hanging out.” These could be individuals who appear to be scoping the facility out.
- Are unwilling to present positive identification or license credentials.
- Seem anxious or uneasy when asked questions regarding their intent.

## Telephone Contacts if You Suspect Suspicious Activity

Florida Department of Agriculture and Consumer Services –

- Bureau of Inspection and Incident Response:  
(850) 617-7996
- Law Enforcement Division: 1-800-342-5869

Florida Department of Law Enforcement Security Hotline:  
1-800-342-0820

FBI

- Jacksonville: (904) 721-1211
- Miami: (305) 944-9101
- Tampa: (813) 273-4566

Make it a habit to store pesticides safely as proper pesticide storage is important to protect people, animals, and the pesticide itself. The most important feature of pesticide storage is to keep it securely locked. Always follow instructions on the pesticide label, Safety Data Sheets, follow best management guidance for the storage of pesticides and remember - The label is the law!

## References Cited

- Store Pesticides Safely, Pesticide Information Program Information Sheet, PIP-37. R.G. Bellinger. Sept. 2001. Clemson University Cooperative Extension Service.
- Pesticide Storage Facilities, FS603. G. M. Ghidui and G. C. Hamilton. Aug. 2001. Rutgers Cooperative Research & Extension.
- Secure Pesticide Storage: General Features. 2016. Frederick M. Fishel. UF/IFAS Extension PI-33, one of a series of the Agronomy Department. <http://edis.ifas.ufl.edu/pi068>
- Pesticide Storage & Mixing Facilities. 2002. Paul E. Sumner and Michael Bader. The University of Georgia, Cooperative Extension, Bulletin 1095. 16 pp. [http://www.caes.uga.edu/publications/pubDetail.cfm?pk\\_id=6204](http://www.caes.uga.edu/publications/pubDetail.cfm?pk_id=6204)
- Pesticide Storage and Mixing Building. Midwest Plan Service. 5pp. [http://www.public.iastate.edu/~mwps\\_dis/mwps\\_web/ms\\_plans.html](http://www.public.iastate.edu/~mwps_dis/mwps_web/ms_plans.html)
- Secure Pesticide Storage: Security Against Terrorist Threats. 2017. Frederick M. Fishel. UF/IFAS Extension PI-41, one of a series of the Agronomy Department. <http://edis.ifas.ufl.edu/pi079>