

## Secure Pesticide Storage: General Features<sup>1</sup>

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## Introduction

Although many pesticide handlers use existing buildings or areas within existing buildings for pesticide storage, it is always best to build a separate facility designated for storing pesticides (Figure 1).



**Figure 1. Designate a separate facility for storing pesticides.**  
A well-designed and maintained pesticide storage site:

- Protects people and animals from exposure.
- Reduces the chance of environmental contamination.
- Prevents damage to pesticides from temperature extremes and excess moisture.
- Safeguards pesticides from theft, vandalism, and unauthorized use.
- Reduces the likelihood of liability.

## 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 (Figure 2).

 <b>CHARLES H. BRONSON</b> <b>COMMISSIONER</b>	<p style="text-align: center;"><b>Florida Department of Agriculture &amp; Consumer Services</b>  <b>Division of Agricultural Environmental Services</b></p> <p style="text-align: center;"><b>PESTICIDE USE INSPECTION REPORT</b></p> <p style="text-align: center;">Section 487.071, F.S.</p> <hr/> <p>File Number: _____ Date: _____ County: _____</p> <p>File Name: _____ File Type: _____</p> <hr/> <p><b>I. FIRM OR INDIVIDUAL INSPECTED</b></p> <p>Name: _____</p> <p>Mailing Address: _____</p> <p>City: _____ Zip Code: _____</p> <p>Physical Address: _____ City: _____</p> <p>Telephone Number: (_____) _____</p> <hr/> <p><b>II. HISTORY OF BUSINESS</b></p> <p>Corporate/Company Officers Title and Responsibility      _____      _____      _____</p> <p>Name and Address of Related Firms: _____</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Persons Interviewed</td> <td style="width: 50%;">Title</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table> <p>Number of Licensed Applicators at Firm: _____</p> <hr/> <p><b>III. PESTICIDE STORAGE</b></p> <p>1. Are RUP's stored in a secure manner? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p>2. Are pesticides stored according to label directions? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p>3. Condition of storage area appears not to injure or endanger water/humans/wildlife/livestock/crops? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</p> <p>Comments: _____</p> <hr/>	Persons Interviewed	Title	_____	_____	_____	_____
Persons Interviewed	Title						
_____	_____						
_____	_____						

Figure 2. EDACS inspection checklist for pesticide storage.

## Secure the Site

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, keep it securely locked. Post highly visible warning signs (Figure 3) on doors and windows to alert people that pesticides are stored inside. In addition, post "No Smoking" warnings; many pesticides are highly flammable.



Figure 3. Post signs on storage facilities to alert people that pesticides are present.

## Prevent Water Damage

Locate the pesticide storage facility where water damage is unlikely to occur. 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 some other containment structure around it (see Figure 4).

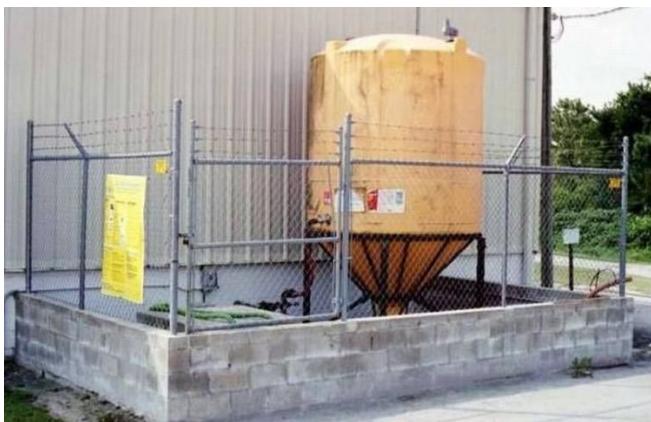


Figure 4. Pesticide bulk storage tank contained within a cinderblock dike.

The US Natural Resources Conservation Service and the Florida Department of Environmental Protection recommend that pesticide-handling facilities are located a minimum of 100 feet from water sources. Water or excess moisture can damage pesticide containers and their contents.

Moisture causes:

- Metal containers to rust (Figure 5).
- Paper and cardboard containers to split or crumble (Figure 6).
- Pesticide labeling to peel, smear, or otherwise become unreadable.
- Dry pesticides to clump, degrade, or dissolve.
- Slow-release products to release their active ingredients.



Figure 5. Moisture can cause pesticide storage containers made of metal to rust.



Figure 6. Moisture can cause pesticide storage containers made of paper to split.

## Control the Temperature

Choose a cool, well-ventilated room or building that is insulated or temperature-controlled. Exhaust fans directed to the outside of the building reduce temperatures and remove dust and vapors from the storage facility (Figure 7). The pesticide labeling often specifies the temperature limits for storing a product (Figure 8).



Figure 7. Exhaust fan at pesticide storage facility helps reduce temperatures and remove dust and vapors from the facility.

#### STORAGE AND DISPOSAL

**DO NOT** contaminate water, food, or feed by storage or disposal.

**PESTICIDE STORAGE.** **DO NOT** store above 120°F. Store in original containers and keep closed. Store in a cool, dry place.

Figure 8. Labels often state storage temperature limitations. Temperature extremes can decrease the effectiveness of some pesticides. In addition, freezing temperatures can result in breakage of glass, metal, and plastic containers. Excessive heat can cause plastic containers to melt, some glass containers to explode, and a few pesticides to volatilize and drift from the storage site. Always store pesticide containers out of direct sunlight to prevent overheating.

### Provide Adequate Lighting

Be sure the facility is well lit. Pesticide handlers using the facility must be able to see well enough to read the pesticide label and notice whether containers are leaking or corroding. Because of the volatility of some pesticide formulations, use only spark-proof lighting fixtures and switches.

### Use Nonporous Materials

Construct the floor of the pesticide storage area using sealed cement, glazed ceramic tile, no-wax sheet flooring, or other material that is free of cracks and easy to clean and decontaminate in the event of a spill or leak. Carpeting, wood, soil, and other absorbent floors are not suitable because they are difficult or impossible to decontaminate. A floor that slopes into a containment system or that is recessed below the level of the doors helps to keep spilled or leaking pesticides within a confined area (Figure 9).



Figure 9. A recessed floor helps control spills or leaking pesticides.

For ease of cleanup, choose shelving and pallets made of non-absorbent materials, such as plastic or metal (Figure 10).



Figure 10. Store pesticides on metal shelving with the heaviest containers and liquids stored on the lower shelves.

### Maintain the Storage Site

Store only pesticide containers, pesticide equipment, and a spill cleanup kit at the storage site. Never keep food, drinks, tobacco, feed, medication, medical or veterinary supplies, seeds, clothing, or personal protective equipment (other than that necessary for emergency response) at the site. These items could become contaminated by pesticide vapors, dusts, or spills, resulting in accidental exposure to people or animals. Water should be available at the pesticide storage site for the purpose of decontamination (Figure 11).



Figure 11. Permanent plumbing at a decontamination site outside of a pesticide storage facility.

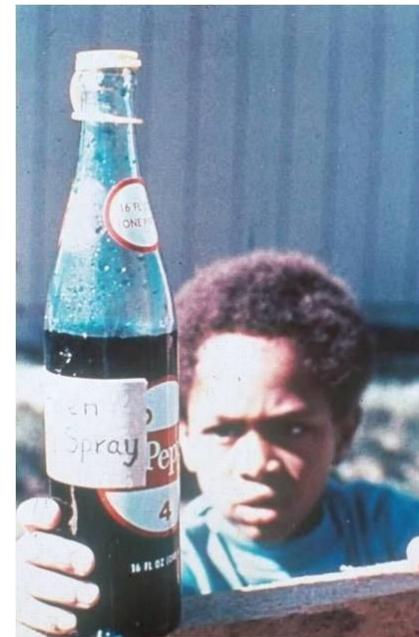


Figure 12. Never store pesticides in containers made for storing food or drink.

## Keep Labels Legible

Store pesticide containers with the labels in plain sight. Costly errors can result if the wrong pesticide is chosen. If the label is destroyed or damaged, immediately mark the container with some basic labeling information, such as the trade and common name of the product, the EPA registration number, the amount of active ingredient(s), the signal word, the use classification, and the manufacturer. Then request a replacement from the pesticide dealer or distributor.

## Store Pesticides in Accurately Labeled Containers that Seal Securely

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 (Figure 12), as well as adults (Figure 13), 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.

Columbia, Mo., Thursday, June 19, 1997

## One woman dies after drinking bug killer stored in wine bottle

ATLANTA, (AP) — Someone decided to use an old wine bottle to store a highly toxic bug killer. One woman died and another was seriously injured when they drank it.

The fumes from the pesticide were so strong they sickened medical personnel who were treating the women.

Members of the DeKalb County Fire Department's hazardous materials team and police evacuated and decontaminated the apartment where the women ingested the substance believed to contain organic phosphate, a chemical commonly used in insecticide.

Jan Heuett, 45, of Decatur, Ga.,

Lowe, 42, was in serious condition today at DeKalb Medical Center. Lowe's hometown was unavailable.

Symptoms of organic phosphate poisoning include headache, dizziness and nausea.

Eleven employees at the hospital, including a doctor, began showing symptoms after the women were

rushed to the emergency room vomiting and struggling to breathe yesterday afternoon, said Patricia Horton, the hospital's director of critical-care and emergency room services.

Fire officials said the women unknowingly consumed the pesticide after someone carelessly stored it in an empty wine bottle. Investigators

didn't know who it was.

Neighbors at the Decatur apartment complex where one of the women lived said there had been problems with fire ants in the area.

"A lot of times people accidentally put things in their beverage bottle," said W.B. Johnson, a fire department battalion chief. "They're finished with the beverage, so they put something else in there to store it."

The medical staff who dealt with the women were treated and later returned to work, while the room was sealed off and the contaminated air was filtered out, hospital spokeswoman Linda Tierney said.

"At no time were other patients in jeopardy," she said.

Figure 13. This news report provides an example of the hazard associated with use of an improper container for pesticide storage.

Keep containers securely closed when not in use. Dry formulations tend to cake when wet or subjected to high humidity. Opened bags of wettable and soluble powders, dry flowables, dusts, and granules can be placed into sealable plastic bags to prevent a spill.

Place large drums and heavy bags on plastic pallets. Store other pesticides on metal shelving, placing the heaviest containers and liquids on the lower shelves. Do not allow containers to extend beyond the edge of shelving because the containers could easily be bumped or knocked off. Be sure the shelving is sturdy enough to handle the quantity and weight. Store volatile pesticides separately to avoid possible cross-contamination of other pesticides.

Place bulk or mini-bulk tanks on a reinforced concrete pad or other impermeable surface. Diking around a tank will keep spilled or leaking pesticides inside a restricted area and also helps to prevent damage to the tanks from vehicles and equipment. Construct the area inside a dike large enough to contain the volume of the liquid in the tank

plus at least an additional 10 percent. Keep valves and pumps within the diked area. Make sure all drains within the dike connect to a holding tank. Outside, use fencing to prevent tampering or unauthorized access to any bulk tanks (see Figure 14).



Figure 14. Large pesticide storage facility with bulk tanks within diking for containment and the area fenced for security.

## Look for Damage

Inspect pesticide containers regularly for tears, splits, breaks, leaks, rust, or corrosion (see Figure 15). If you find a damaged container, immediately put on appropriate personal protective equipment and take immediate action to prevent the pesticide from leaking or spreading into its surroundings. If a container is already leaking, take corrective action to prevent further leaking and immediately clean up any spilled pesticide. Be especially careful if the damaged container is an aerosol can or fumigant cylinder that contains pesticides under pressure.



Figure 15. Dry pesticide spilled from torn bags.

Depending on the specific situation, consider the following actions:

- Use the pesticide immediately at a site and at a rate allowed by the label.

- Transfer the pesticide into another pesticide container that originally held the same pesticide and has an intact label. Be sure the new container can be tightly closed. If possible, remove the label from the damaged container and place it on the new container. Otherwise, temporarily mark the new container with basic labeling information and get a copy of the label from the pesticide dealer or distributor as soon as possible.
- Place the entire damaged container and its contents into a suitable larger container.

## Note Shelf Life of Pesticides

Keep an inventory of all pesticides in storage and mark each container with its purchase date (Figures 16 and 17).



Figure 16. Inventory notebook detailing pesticides inside a storage facility.



Figure 17. Containers clearly marked with dates of purchase. Be sure to note if the product has an effective shelf life listed on its label. If you have questions about the shelf life of a product, contact the dealer or manufacturer. Signs of pesticide deterioration from age or poor storage conditions may appear during mixing. Watch for excessive clumping, poor suspension, layering, or abnormal coloration during mixing. Other times, however, the first indication of pesticide deterioration from age or poor storage conditions may be poor pest control and/or damage to the treated crop or surface.

To minimize storage problems, avoid storing large quantities of pesticides for long periods. Keep records of previous usage to make good estimates of future needs. Buy only as much as you need for the season.

## Isolate Waste Products

Do not accumulate outdated or cancelled pesticide products. Make every effort to use up what you purchase because leftover pesticides may become hazardous waste. All of these materials could be subject to additional federal regulations on the storage, disposal, and reporting of hazardous materials. These materials include:

- Outdated products, such as those whose shelf life has expired.
- Cancelled products, past the date of legal use.

If you are saving pesticides or pesticide containers for disposal or recycling, store them in a special section of the storage site (Figure 18). Make sure all empty containers are triple-rinsed or pressure-rinsed before storing for disposal or recycling. For more on this topic, see EDIS Publication PI-3, *Pesticide Container Rinsing*, <https://edis.ifas.ufl.edu/pi003>.



Figure 18. Empty pesticide containers stored prior to transporting to a recycling event.

## Make a Checklist

Safety is the key element in proper pesticide storage. If you answer "no" to any of the statements in Table 1, you should correct your storage facility immediately.

## Additional Information

Dean, T.W., O.N. Nesheim and F.M. Fishel. 2005. *Pesticide Container Rinsing*. EDIS PI-3. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/pi003> (accessed February 2016).

Fishel, F.M. 2006. *Storage Limitation Statements: Temperature—Fungicides*. PI-122. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/pi159> (accessed February 2016).

Fishel, F.M. 2006. *Storage Limitation Statements: Temperature—Herbicides*. PI-123. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/pi160> (accessed February 2016).

Fishel, F.M. 2007. *Pesticide Spill Kits*. PI-159. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/pi196> (accessed February 2016).

Nesheim, O.N. and F.M. Fishel. 2005. *Proper Disposal of Pesticide Waste*. PI-18. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/pi010> (accessed February 2016).

**Table 1. Pesticide storage checklist.**

<b>Date of Inspection:</b>		
<b>General Information</b>	<b>Yes</b>	<b>No</b>
Clean, neat pesticide storage site		
Current, on-site pesticide inventory		
Posted emergency phone numbers		
Labels and SDS on file		
Accurate storage inspection log maintained		
<b>Pesticide Containers</b>	<b>Yes</b>	<b>No</b>
Containers marked with purchase date		
Insecticides, herbicides, and fungicides segregated		
Pesticides stored in original containers		
Labels legible and attached to containers		
Container caps tightly closed		
No reused pesticide containers present		
Pesticides stored off the floor and low to the ground		
Dry formulations stored on pallets		
Feeds stored separately from pesticides		
Used containers rinsed and punctured		
Rinsed and unrinsed containers separated		
<b>Spills and Disposal</b>	<b>Yes</b>	<b>No</b>
Storage area free of spills and leaks		
Shovel and absorbent materials		
Floor drains sealed (if present)		
<b>Safety Information</b>	<b>Yes</b>	<b>No</b>
No smoking signs posted		
Safety equipment separated from pesticides		
Fire extinguisher in good working order		
Storage room locked		
Storage room posted: <i>Pesticides. Keep Out.</i>		
Storage site well lit and ventilated		

<sup>1</sup>This document is PI33, one of a series of the Department of Agronomy, UF/IFAS Extension. Original publication date April 2004. Revised February 2016 and April 2025. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

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