

**CHECKLIST
PESTICIDE STORAGE, HANDLING AND DISPOSAL**

- ✓ Limit the amounts and types of pesticides stored.
- ✓ Storage of pesticides should not be in basements or areas prone to flooding and should be accessible in the event of an emergency.
- ✓ The storage cabinets should be kept locked and the door to the storage area should be properly identified with a sign.
- ✓ Mixing should be avoided in areas where a spill, a leak or overflow could allow pesticides to get into water systems.
- ✓ Absorbent material such as re-usable gelling agents, vermiculite, clay, pet litter or activated charcoal should be on hand along with a garbage can and shovel to quickly contain and clean up any spills. The spilled pesticide should be contained - it should not be hosed down.
- ✓ Washing and rinsing of pesticide residues from application equipment, mixing equipment or other items used in storing, handling or transporting pesticides should occur on a pad.
- ✓ No pesticide application equipment or mix tank should be filled directly from any source waters unless a back siphon prevention device is present.
- ✓ Materials Safety Data Sheets for each pesticide should be posted in a prominent location.
- ✓ An emergency response plan should be developed. Such a plan lists actions to take and personnel to contact in the event of a spill or accident.
- ✓ An automatic smoke detection system or smoke and heat detection system should be installed. The appropriate fire prevention and emergency procedures should be devised in consultation with the local fire department. Suitable methods for extinguishing fires should be installed
- ✓ Personal protection equipment such as respirators, chemical resistant (CR) gloves, CR footwear, coveralls with long sleeves, protective eyewear, CR headgear, CR aprons and a first-aid kit should be available immediately outside the storage area.
- ✓ Rinse liquid pesticide containers three times when emptied. The rinse material should be poured into a spray tank and applied to a registered site. Triple-rinsed containers are considered non-hazardous and should be disposed of according to state recommendations.

PESTICIDE STORAGE, HANDLING AND DISPOSAL

The storage of pesticides is regulated under the **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)** <http://www4.law.cornell.edu/uscode/7/ch6schII.html> , which governs the sale, distribution and use of pesticides in the U.S. Pesticides are regulated under FIFRA until they are disposed, after which they are regulated under the **Resource Conservation and Recovery Act (RCRA)** <http://www4.law.cornell.edu/uscode/42/ch82.html> which ensures responsible management of hazardous and nonhazardous waste. Some, but not all, pesticides are regulated as hazardous waste when disposed. The Department of Transportation (DOT) regulates the transport of hazardous materials <http://www.phmsa.dot.gov/hazmat> . Some, but not all, pesticides are regulated as DOT hazardous materials while in commerce. The Massachusetts Department of Agricultural Resources has developed several guidance documents on storage, mixing and loading. The Department of Environmental Protection (MassDEP) regulates and provides guidance on hazardous waste disposal.

This section contains excerpts from “Pesticide Storage Mixing and Loading guidelines for applicators” http://www.mass.gov/agr/pesticides/waste/docs/mixload_medlarge.pdf from MDAR. For more information on pesticide storage and disposal see: <http://www.mass.gov/agr/pesticides/waste/index.htm>

Poorly stored pesticides and improper mixing/loading practices can present a potential risk to our health and to the integrity of the environment. The quality of surface water, groundwater and soil can be degraded in areas where pesticides are stored under inappropriate conditions, improperly mixed and loaded into application tanks and where equipment is washed and rinsed after application. Accidents involving spills or leakages may have serious health and environmental consequences. The purpose of this section is to provide guidance to individuals looking for information on appropriate techniques and approaches for the mixing, loading and storage of pesticides. It is important to remember that mixing, loading and storage needs will vary greatly from situation to situation and site to site. No document could specify exactly what approach should be taken in each situation. As such, it should be kept in mind that this document is intended as general guidance only. These recommendations are designed to assist pesticide users in managing their storage areas and conduct their mixing/loading operations in ways that will help minimize exposure to pesticides and reduce the risks to public health and the environment. These are not intended to be regulations and are not enforceable by any state or local agency.

Pesticide Storage

Safety is the key element in pesticide storage. The safest approach to any pesticide problem is to limit the amounts and types of pesticides stored. It is also important that the storage facility (cabinet, room, building, etc.) can be locked and can limit access to only those individuals who are properly trained in the use of pesticides.

Selecting a Storage Location

An existing or proposed area should be carefully evaluated to determine its suitability for pesticide handling and storage. In particular the potential harm to human health and the environment due to spills, contaminated runoff or fires should be assessed. Pesticide storage should be restricted to a first story room or area which has direct access to the outside (according

to the Board of Fire Prevention). Pesticides cannot be stored in basements. Pesticides should not be stored outdoors.

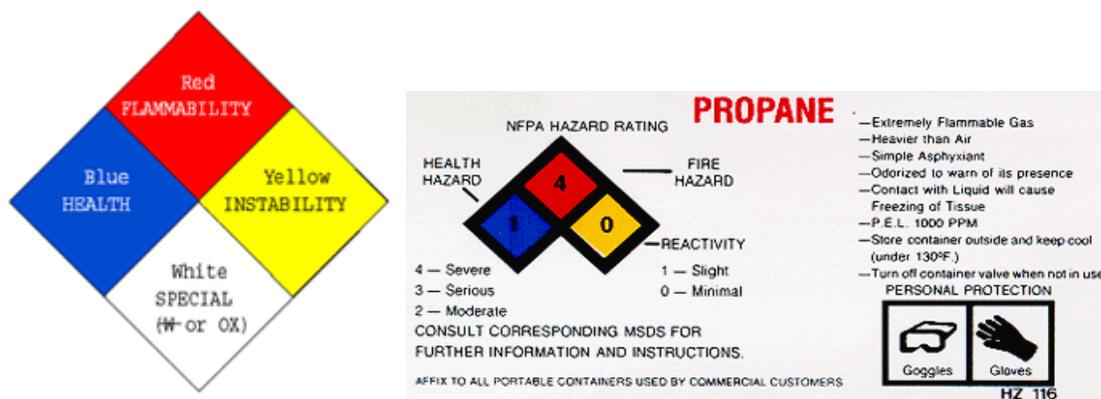
If possible, the area should be located at least four hundred feet (preferably down hill or down gradient) from any public or private drinking water supplies and two hundred feet (preferably down hill or down gradient) from surface water. Separation from water resources should be greater in areas of sandy soil or fractured bedrock. Storage sites should not be located in areas prone to flooding. Runoff from adjacent areas resulting from a 25 year 24 hour storm should be diverted around the facility. The site location should be accessible in the event of an emergency situation. The pesticide storage area should be located away from direct sunlight, freezing temperatures and extreme heat.

Where practical, the mixing area should be located close to the storage facility to minimize the distance that chemicals are carried. Consideration should also be given to the additional area required by a mixing pad when selecting the site for storage.

Pesticides should be stored away from fertilizer, food, feed, potable water supplies, veterinary supplies, seeds and personal protective equipment to avoid contamination.

Storage Practices

The storage area should be properly identified with signs such as, "Pesticide Storage Area." In addition, a NFPA Hazardous Rating Placard (<http://www.nfpa.org/faq.asp?categoryID=928>) should be posted at entrances to the pesticide storage facility. These ratings are located in the Material Safety Data Sheets. Emergency responders will be able to make an assessment on how to respond to an incident (spill, fire, etc.) based on this placard.



A list (inventory) of the products being stored should be posted on the outside of the storage facility. It is also a good idea to have Material Safety Data Sheets for stored pesticides available in a location adjacent and/or outside of the storage facility.

Pesticides should be stored in accordance with their label requirements in their original container with the label clearly visible. Unless otherwise indicated on pesticide labels, temperatures in the storage area should be kept between 40F and 100F.

They should always be kept off the ground to prevent the accumulation of water in or under the containers.

Separation of pesticides by hazard and function is essential. Flammable pesticides should be stored separately from non-flammable pesticides, in a fire proof cabinet for example. Fungicides, herbicides and insecticides should be stored in separate locations of the storage area to prevent cross contamination and accidental misuse.

Dry pesticides should be stored separately from liquid pesticides to avoid wetting from spills. Particular care should be taken if storing phenoxy herbicides (such as 2,4-D and MCPA) due to their volatility. Pesticides shall not be stored in the same place as ammonium nitrate fertilizer (according to the Board of Fire Prevention).

Exposure to sunlight can cause chemical breakdown. Pesticides should not be stored in front of windows, unless the windows are covered. Extremes in temperatures can also lead chemical breakdown of stored pesticides. Because shelf life is difficult to predict, pesticides should not be stored longer than two years and therefore the purchase date can written on the pesticide container.

Storage of Medium Quantities of Pesticides Inside an Existing Building

For storage of medium quantities (less than 500 pounds or 220 gallons) of pesticides inside an existing building, metal cabinets work well. Metal cabinets should be double walled and constructed with 18-gauge sheet metal. Steel cabinets for storing hazardous materials such as pesticides are available commercially in different dimensions of various capacities. Capacities range from one gallon cans to five gallon cans and fifty five gallon drums. Frequently, cabinets feature built in secondary containment systems such as deep, leak-proof sumps. Wooden cabinets can also be used but should be constructed from 1" thick exterior grade plywood and finished with a chemically resistant product that permits easy cleanup. Shelves can be wooden (if finished with a chemically resistant product) or metal. The door sill to the cabinets should be high enough -at least 5"- to contain up to 5 gallons of spilled liquid. The cabinets should be locked at all times and identified as a place of pesticide storage. The cabinets should be located along an outside wall in an area away from extreme heat or freezing.

In the absence of cabinets, storage containers can be placed on impermeable shelves (steel or painted wood) with a lip to catch minor spills or leaks. Storing the containers in plastic leak proof trays to contain any leaks is recommended. Other options include spill containment pallets or floor pallets. Access should be unimpeded. Leaks should be detectable. If containers are in danger of leaking, they should be placed in an oversized plastic container or plastic lined (leak proof) cardboard box with vermiculite or other non flammable absorbent material for spill protection. Flammable pesticides should be stored separately from non-flammable pesticides in a fire proof cabinet.

For information on storage facilities for **large quantities of pesticides**, mixing/loading pads and other details see: Pesticide Storage Mixing and Loading guidelines for applicators,

http://www.mass.gov/agr/pesticides/waste/docs/mixload_medlarge.pdf

Pesticide Mixing and Loading Sites

Mixing should be avoided in areas where a spill, a leak or overflow could allow pesticides to get into water systems. The mixing and/or loading of pesticides should not occur within four hundred feet of any private or public drinking water supply or two hundred feet of surface water. No pesticide application equipment or mix tank should be filled directly from any source waters unless a back siphon prevention device is present. Mixing should not occur on gravel or other surfaces that allow spills to move quickly through the soil.

Appropriate personal protective equipment (PPE) should be worn before opening a pesticide container. The label should be checked for Agricultural Use Requirements. PPE should include chemical resistant gloves and front protection such as a bib top apron made of butyl, nitrile, or foil laminate material. A face shield, shielded safety glasses or goggles should be worn. When pouring any pesticide from its container, container and pesticide should be kept below face level. A respirator will ensure protection against dusts or vapors. A tank should never be left unattended while it is being filled. If the pesticide user should splash or spill pesticides on his person, he should stop the operation, wash thoroughly with a mild liquid detergent and water, put on clean PPE and clean up the spill.

All transfers of pesticides between containers, including mixing, loading and equipment cleaning, should be conducted over a spill containment surface designed to intercept, retain and recover spillage, leakage and wash water. Containment needs depend on the quantities of pesticides that are being mixed and loaded. If mixing small quantities, a tarpaulin can be sufficient to contain any spills. Spills can be then cleaned up with an absorbent material. If mixing large quantities regularly, the construction of a mixing/loading pad is an option to consider. The important point to keep in mind, whichever approach is used, is that incidental spills or accidental spills can be contained and cleaned up.

Absorbent material such as re-usable gelling agents, vermiculite, clay, pet litter or activated charcoal should be on hand along with a garbage can and shovel to quickly contain and clean up any spills. The spilled pesticide should be contained - it should not be hosed down. Absorbent materials should be used to soak up the pesticide which can then be shoveled into a leak proof drum. Portable rolls of sorbent materials can be used to contain the spill while the spill is soaked up.

Guidelines for Mixing Safely

- Obtain the proper training before mixing pesticides. See section on pesticide licensing.
- Wear personal protection equipment specified on the label.
- Mix in a well ventilated area.
- Measure using appropriate scale or measuring cup.
- Ideally your waist should be even with the opening of the tank.
- Pour pesticide down the side of the tank to avoid splashing.
- Make sure you have a solid footing while pouring.
- Do your calculations prior to mixing.
- Mix during daylight hours if possible.
- Water supply is required to have a back flow prevention device - to prevent back flow into the water supply.
- Water should be carefully added to the pesticide mix by pouring down the side of the tank.
- Do not submerge the end of the water supply hose into the pesticide mix as it could back siphon. Pipe or hosing should be suspended over the opening of the tank
- Wash gloves before removing them.

Washing and Rinsing Operations

Washing and rinsing of pesticide residues from application equipment, mixing equipment or other items used in storing, handling or transporting pesticides should occur on a pad. In order to reduce the need to frequently wash the application equipment and to avoid cross contamination, application equipment should be dedicated for use for certain types of pesticides. For example, if a backpack sprayer is used only for applying herbicides it would not necessarily be washed after each use. On the other hand if the backpack sprayer was used to apply both herbicides and insecticides it would be necessary to always clean the equipment to avoid cross contamination.

Emergency Response Plan

An emergency response plan should be developed. Such a plan lists actions to take and personnel to contact in the event of a spill or accident. The plan should begin with a current listing of the pesticides used or stored at the facility and should include the following information:

- Names and quantities of pesticides;
- Location of the property including a map with directions;
- Names, addresses and telephone numbers of the owner and key employees;
- Plan of the facility showing pesticides locations, flammable materials, electrical service, water supply, fuel storage tanks, fire hydrants, storm drains, and nearby wetlands, ponds, or streams;
- Location of emergency equipment supplies including breathing equipment and protective equipment; Copies of the emergency response plan should be located near the entrance to the pesticide facility and with business records. Copies should also be given to the local police department and fire department. Contacts should include the following: fire department; police; spill clean up firm; nearest hospital; MDAR Pesticides Program; board of health; owner of the facility. The plan should be available in both English and the language or languages understood by workers if this is not English.

Fire Prevention

An automatic smoke detection system or smoke and heat detection system should be installed. The appropriate fire prevention and emergency procedures should be devised in consultation with the local fire department. Suitable methods for extinguishing fires should be installed, such as the appropriate type and number of fire extinguishers. The number and placement of fire extinguishers should conform with the National Fire Protection Association (NFPA) Standard No. 10. All electrical fixtures and appliances should be non-sparking units approved for use in facilities storing flammable and combustible liquids. In the event of a fire it is frequently more environmentally sound to allow the fire to burn itself out if it can be contained within the area. This avoids the likelihood of pesticides being released into the ground as a result of water being added.

Personal Safety

Personal protection equipment such as respirators, chemical resistant (CR) gloves, CR footwear, coveralls with long sleeves, protective eyewear, CR headgear, CR aprons and a first-aid kit should be available immediately outside the storage area. The first-aid kit should include the following items: adhesive strips, tape, eye pads, gauze bandages and tweezers. The phone number 800-222-1222 for the Poison Control Center should be posted in a prominent location.

It is essential that protective eyewear be worn during mixing/loading. The protective eyewear should consist of safety glasses that provide front, brow and temple protection, goggles or a face shield. Workers should be instructed in the correct procedure for the removal of contaminated clothing. Eye wash stations or portable eye wash bottles should be easily accessed by each person engaged in the operation and should be capable of flushing eyes for a minimum of fifteen minutes. At a minimum, a hose and nozzle should be on hand. Routine wash up facilities, equipped with soap, hand cleanser and single use paper towels should be available near the storage area.

Pesticide Spills and other Accidents

An absorbent material such as re-usable gelling agents, vermiculite, clay, pet litter or activated charcoal should be on hand along with a garbage can and shovel to quickly contain and clean up any spills. All discharges to the environment or spills should be recorded. The records should include the date and time of the incident and the cleanup. The Massachusetts Department of Agricultural Resources must be notified within 48 hours if a pesticide spill leads to pollution.

Site Security

The storage cabinets should be kept locked and the door to the storage area should contain a weather proof sign warning of the existence and danger of pesticides inside. The door should be kept locked. The sign should be visible at a distance of twenty five feet and can contain a notice such as:

DANGER PESTICIDE STORAGE AREA, ALL UNAUTHORIZED PERSONS KEEP OUT, KEEP DOORS LOCKED WHEN NOT IN USE

The sign should be posted in both English and the language or languages understood by workers if this is not English.

Pesticide Disposal

Proper disposal of pesticides and their containers is an important phase of pesticide management. An improperly disposed product can be hazardous to people and the environment. Rinse liquid pesticide containers three times when emptied: fill the containers about one-third full and swish it around. Allow the containers to drain well between each rinse (30 or more seconds). The rinse material should be poured into a spray tank and applied to a registered site. Triple-rinsed containers are considered non-hazardous and should be disposed of according to state recommendations. Never reuse an empty pesticide container. If an empty triple-rinsed container cannot be disposed of immediately, store it in a safe, locked area. Before throwing out powders or granular pesticide containers, be sure to remove all contents from the containers.

Plan ahead in preparing spray mixtures! Mix only the amount of pesticide you need to do the job. Left over spray mixture needs to be applied according to the label instructions. When cleaning equipment be sure rinse water will not collect or contaminate groundwater or surface water.

A pesticide product that can no longer be used according to the label instructions because it is no longer registered (or for some other reason) is considered hazardous waste. Applicators are advised to use pesticides in the same year of purchase and to store pesticides properly in order to avoid the accumulation of unusable pesticide products. For current state regulations on pesticide

disposal, contact the Massachusetts Department of Agricultural Resources, 617.626.1771.
<http://www.mass.gov/agr/pesticides/waste/index.htm>

Pesticide Transportation

Depending on the hazard and the quantities of pesticides and hazardous materials (fertilizers, fuel, etc.) being transported, drivers may need to obtain a Massachusetts Commercial Driver's License with HazMat and/or Tank Endorsements (please refer to MassRMV website <http://www.mass.gov/rmv/license/8cdl.htm#applying>). There may be additional requirements for placards, training, and record keeping under the Federal Transportation Regulations (please refer to MDAR website <http://www.mass.gov/agr/pesticides/waste/index.htm>)

At a minimum the following checklist can be helpful for transporting pesticides

- Driver is a licensed or certified pesticide applicator
- Inspect vehicle for leaks or other problems
- Pesticide containers secured in place
- Pesticide containers stored in a dry and lockable portion of the vehicle but not in the same compartment of driver
- Binder of pesticide labels and MSDS
- Emergency phone numbers
- First aid kit
- Fire Extinguishers
- Cleaning up supplies for spills (kitty litter, shovel, plastic bags, etc)
- PPE (gloves, goggles, coveralls, etc)
- At least 5 gallons of potable water for emergency eye or skin decontamination
- Obey all traffic laws and use signals

References

Pesticide Storage Mixing and Loading Guidelines for Applicators
http://www.mass.gov/agr/pesticides/waste/docs/mixload_medlarge.pdf

Pesticide storage and disposal state regulations: Massachusetts Department of Agricultural Resources
<http://www.mass.gov/agr/pesticides/waste/index.htm>