



Storing Pesticides

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Cornell University

Pesticide Management Education
Program



Expectations of Storage Facility and Practices

◆ Business Concerns

- Protect products from deterioration and theft
- Move product and track inventory easily
- Reduce your liability

◆ Legal Concerns

- Comply with state and federal laws
- Meet building, electrical, fire codes



Expectations of Storage Facility and Practices

◆ Safety Concerns

- Protect employees, customers, community
- Prevent unauthorized access
- Contain pesticides in case of spill or fire



Contents of Storage Facility: What Goes In

- ◆ Pesticides in original, labeled containers
- ◆ Pesticide-treated seed, herbicide-impregnated fertilizer, rodent baits, but separate from pesticides.
- ◆ Pesticide rinsate in labeled tanks
- ◆ Pesticide waste for proper disposal
- ◆ Pesticide application and transfer equipment
- ◆ Emergency response equipment (not PPE)



Contents of Storage Facility: What Stays Out

- ◆ Personal protective equipment (PPE)
- ◆ First Aid supplies
- ◆ Seed, bulbs, cuttings
- ◆ Fertilizer, compost, mulch, planting media
- ◆ Food and feed
- ◆ Fuel

If Expectations Are Unmet...





Harmony

Poast Plus

KEEP OUT OF REACH OF CHILDREN
CAUTION
READ LABEL BEFORE USING

Location of Storage Facility

- ◆ Separate facility or a designated secure area within existing building
- ◆ Away from homes, livestock, and water supplies
- ◆ Separate from office and retail space
- ◆ Area not prone to flood – **why?**
- ◆ Runoff can't enter wells, surface waters
- ◆ Downwind from sensitive areas
- ◆ On ground floor of building





Design: Temperature/Humidity

- ◆ Maintain temperature at 40°F to 100°F
- ◆ Insulate building
- ◆ Heat in winter
 - Pesticides away from heat source
 - Use external furnace/boiler and fuel supply
- ◆ Ventilation



Design: Temperature/Humidity

◆ High Temperature

- Liquids expand, containers become pressurized
- Formulations can deteriorate
- Petroleum solvents may be flammable

◆ Low Temperature

- Liquids can deteriorate (e.g., crystallize)
- Containers rupture easily

◆ High Humidity

- Labels peel and become illegible
- Dry formulations cake

Design: Ventilation



◆ Purpose

- Temperature/humidity control
- Prevent buildup of flammable fumes
- Reduce employee exposure to fumes

Design: Ventilation



◆ Specifications

- Mechanical
- Designed for use in presence of flammable vapors
- 1 ft³ per minute per ft² or 6 air exchanges per hour when occupied.



Bulk Pesticides? Recommendations

- ◆ **More than 55 gallons of liquid, 100 lb. of solid materials**
- ◆ **Storage should hold 110% of volume of largest bulk container**
- ◆ **Storage in bermed impermeable floor**
- ◆ **Spill collection sump and holding tank.**



Pesticide Fires: Risks

- ◆ Some solvents flammable
- ◆ Some powders explode in fire
- ◆ Toxic smoke and vapor
- ◆ Contaminated water runoff
- ◆ Leftover debris contaminated



Design: Fire Prevention

- ◆ Comply with electrical and fire codes
- ◆ Temperature control
- ◆ Ventilation
- ◆ Keep pesticides away from heat source
- ◆ Use non-sparking electrical fixtures
- ◆ Exterior boiler/furnace and fuel supply

Design: Fire Prevention

- ◆ “No Smoking” signs ENFORCED
- ◆ Post signs to warn firefighters of hazard
- ◆ Keep local fire department informed
- ◆ Smoke alarms and fire alarms
- ◆ Dry-chemical fire extinguishers
- ◆ Avoid overhead sprinkler system
- ◆ Physically separate flammable products





Design: Spill Prevention

- ◆ All containers on pallets or shelves
 - Plastic or metal easier to clean
 - Put containers in plastic tubs



Design: Spill Containment

- ◆ Area well lit to detect leaks early
- ◆ Impermeable floor sealed at joints
- ◆ Slope, berm, or sump to hold 25% of stored liquid
- ◆ Shovel and absorbent material on hand



Worker Safety


- ◆ PPE and first aid kit OUTSIDE of facility

- ◆ Emergency eye wash and shower



Worker Safety

- ◆ Post emergency phone numbers



| SAFETY INFORMATION EMERGENCY TELEPHONE NUMBERS | |
|---|--------------|
| FIRE | 911 |
| SHERIFF | 911 |
| AMBULANCE | 911 |
| HOSPITAL | 315-787-4000 |
| POISON CONTROL | 800-333-0542 |
| CHEMTREC | 800-424-9300 |
| D.E.C. | 800-457-7362 |



Worker Safety: Training

- ◆ OSHA, NYS Worker Right-To-Know
- ◆ Comply with certification and direct supervision requirements
- ◆ Proper handling practices
- ◆ Facility policies and procedures
- ◆ How to respond to spill/fire/exposure
- ◆ Worker protection standards training



Receiving Pesticides

Refuse containers that:

- ◆ Lack an intact label
- ◆ Have a broken seal
- ◆ Are damaged
- ◆ Damaged, leaking, or contaminated by another leaking container



See product label for storage requirements !

- ◆ Consider hazard class, flammable?
- ◆ Potential contamination from vapors or odors
- ◆ Formulation? Liquids not stored above products in paper or cardboard
- ◆ Drums on plastic pallet
- ◆ Organize by type of pesticide.
- ◆ Keep labels visible from aisles



Maintain Inventory

- ◆ List of all pesticides in storage with copies of labels
- ◆ In separate location
- ◆ Mark pesticides by date, use oldest first
- ◆ Look for effective shelf-life, if not on label can check with manufacturer



What are signs of product deterioration ?

- ◆ EDC – sludge on bottom and not milky in water
- ◆ Oils – not milky when mixed in water
- ◆ WP – lumping, does not suspend in water
- ◆ Dust & G – clumping & caking
- ◆ Check containers for damage, leaks, rust, corrosion – put damaged containers in plastic tub in case it does start to leak or put into service container with label

Transporting Pesticides

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◆ Risks

- Pesticide storage on wheels
- Pesticide spill if accident
- Hazardous driving conditions
- Driver
- Vehicle maintenance issue
- The “other guy”



◆ Access to pesticides in vehicle?



Transporting Pesticides

- ◆ Pesticide use includes Transport after the manufacturer's seal has been broken
- ◆ Good separation between passenger compartment and pesticides – truck with cap is best.
- ◆ Nonporous truck bed, no sharp objects
- ◆ Monitor temperature





Be prepared for accidents - Kept in passenger compartment

- ◆ Copy of label and MSDS
- ◆ Cell phone
- ◆ Phone number for 24 hr emergency assistance
- ◆ PPE for chemicals transported
- ◆ Soap and water
- ◆ Dry –chemical fire extinguisher
- ◆ Spill kit, shovel, broom, dustpan, bags

Transporting Pesticides

- ◆ Transport pesticides separately from feed, seed, fertilizer, fuel
- ◆ Transport pesticide impregnated products separately from pesticides, etc.
- ◆ Only in the cargo area of vehicle



Transporting Pesticides

Loading:

- ◆ Wear work cloths and chemical resistant gloves
- ◆ Secure containers so they do not move during transport
- ◆ Cover flatbed with tarp
- ◆ Lock cargo box
- ◆ Never leave flatbed unattended!



Transporting Pesticides

Unloading:

- ◆ Take inventory
- ◆ Transfer into pesticide storage
- ◆ Look for spills and **clean cargo area**
- ◆ Return keys to secure location



Transport Regulations - USDOT

Depends on whether hazardous materials, type and quantities:

- ◆ Receive hazardous material training
- ◆ Carry shipping papers and emergency response information in vehicle
- ◆ Placard vehicle
- ◆ Transportation security plan
- ◆ Obtain CDL



Pesticide Security

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Benefits of Pesticide Security

- ◆ Protect workers, community, environment
- ◆ Reduce insurance costs and risk of lawsuits
- ◆ Reduce risk of theft/vandalism
- ◆ Good relations with community



Risks of Poor of Pesticide Security

- ◆ Unintended exposure
- ◆ Vandalism
- ◆ Theft
- ◆ Use by Unqualified applicator
- ◆ Criminal Use or pesticides



When assessing risks to pesticide security on your operation, Consider:

- ◆ Who has keys?
- ◆ Components of drugs or explosives?
- ◆ Small packages get legs.
- ◆ Involve police and employees in planning.

Prevent Unauthorized Access



- ◆ Allow safe and efficient employee access
- ◆ Prevent unauthorized access
 - Customers
 - Children
 - Vandals/shoplifters

Prevent Unauthorized Access



- ◆ Lock doors and windows
- ◆ Post warning signs
- ◆ Fence with locking gate for commercial business
- ◆ Alarm system ?

Control access? Study this!

- ◆ Barriers – locking all access points
- ◆ Signs – Warning and Keep Out
- ◆ Detect unauthorized activity
- ◆ Visitor access
- ◆ Key inventory, worker access
- ◆ Computer security
- ◆ Minimal inventory
- ◆ Report suspicious loss of inventory





Emergency Response

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Pesticide Spills and Fires

- ◆ Impacts on environment on your farm but beyond
- ◆ Emergency responders – firefighters, police, paramedics
- ◆ Flooding to areas off your farm
- ◆ Hurricanes
- ◆ Develop an emergency response plan



Emergency Response Plan:

- ◆ Who is the leader?
- ◆ Prepare step-by-step procedures for each emergency situation
- ◆ How do you decide if you need outside help?
- ◆ List of names, phone numbers and agencies + 911 – required by law, pesticide manufacturers, hazardous waste cleanup?



Emergency Response Plan:

- ◆ Outline of information to provide: name, contact number, what happened where, pesticides and amounts, any injuries or environmental damage
- ◆ Map of facilities shared with emergency responders



Emergency Response Plan:

- ◆ Detailed inventory with labels and MSDS away from storage
- ◆ Inventory of PPE and emergency equipment available and where

Sara Title III: Emergency Planning & Community Right to Know Act

- ◆ To prevent harm to responders from pesticide spill or fire
- ◆ State Emergency Response Commission
- ◆ Local Emergency Planning Committee in each county
- ◆ Depends on amount and type of chemicals

Spills

- ◆ Emergency phone number on label and shipping papers
- ◆ Or CHEMTREC

Spill Kits

- ◆ Handy where handling pesticide or containers, on vehicle that transports
- ◆ Telephone numbers for emergency
- ◆ PPE, chemical resistant for most pesticides: gloves, footwear, aprons
- ◆ Protective eyewear
- ◆ Respirator if required by label

Spill Kits

- ◆ Containment tubes or pads for liquids
- ◆ Adsorbent material for liquid, kitty litter
- ◆ Sweeping compound for dry spills
- ◆ Shovel, broom, dustpan
- ◆ Heavy duty detergent
- ◆ Sturdy sealable bag to put cleanup material in
- ◆ Fire extinguisher for all types of fire

4 C's – spill response

- ◆ Control spill
- ◆ Contain spill
- ◆ Contact authorities to report spill
- ◆ Clean up spill

◆ But first step is ?

PPE



Pesticide Response Plan

- ◆ Work with local fire department, hospital, police
- ◆ Location of storage
- ◆ Floor plan and access point
- ◆ Inventory list and risks of each
- ◆ Segregated areas
- ◆ Location of sensitive areas
- ◆ Discuss foam, water, or let burn?
- ◆ Train workers annually



In case of fire...

- ◆ Evacuate close to fire and downwind
- ◆ Call firefighters – 911, pesticides involved
- ◆ Provide inventory, labels, MSDS
- ◆ Secure perimeter
- ◆ Build dikes if using water
- ◆ Cleanup equipment, take shower
- ◆ Contact authorities