Storing Pesticides
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Cornell University
Pesticide Management Education Program

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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...
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 ft$^3$ per minute per ft$^2$ 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
- Emergency eye wash and shower

OUTSIDE of facility
Worker Safety

- Post emergency phone numbers

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<td>Poison Control</td>
<td>800-333-0542</td>
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<td>Chemtrec</td>
<td>800-424-9300</td>
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<tr>
<td>D.E.C.</td>
<td>800-457-7362</td>
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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 form 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
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
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