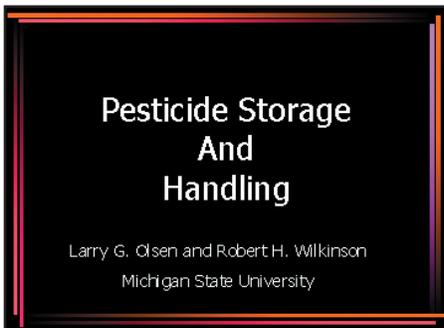
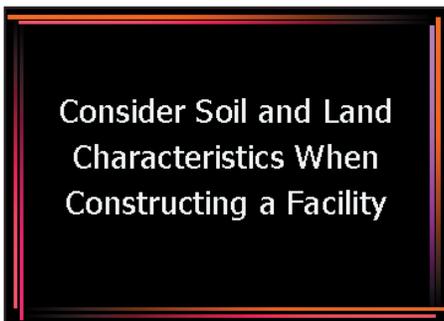




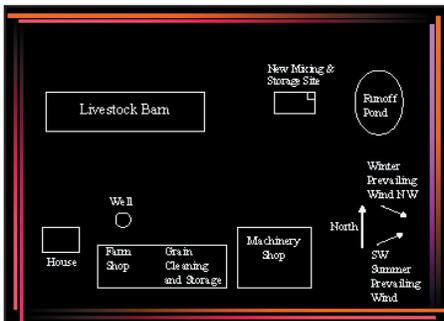
1. Credit slide - This slide set and storyboard was produced by the Michigan State University Pesticide Safety Education Program.



2. Introduction: "Pesticide Storage and Handling"  
Why have storage requirements?  
-Deemed important by society,  
-Good storage facilities and practices enhance product management and provide protection to the environment in the event of a spill or release.  
-Meeting minimum requirements ensures product and container integrity.  
-Good storage practices may be a benefit when considering liability protection.  
-Good storage practices keep chemicals well organized and improves inventory control.



3. Consider soil and land characteristics when constructing a facility to prevent contamination of surface and groundwater by runoff, leaching, and drainage. Chemical storage areas should be at least 2 feet above the water table and should not be located in areas with a high probability of flooding.



4. It is important to consider winter and summer prevailing winds when locations a storage facility on a site. Wind should always be blowing away from the farm buildings, homes and livestock areas.

Minimum Recommended Distance  
From Loading Pad and Storage Area:

- 200 ft - House and Surface Water
- 150 ft - Well
- 50 ft - Fuel Storage and Public Road
- 25 ft - Property Line and Pressurized Water Line

5. These are the recommended minimum distances from loading pad and storage area. A pressurized water line is one that goes to a house or livestock building for human or animal consumption.

A Separate Building for Storage is Preferred

6. A separate building for storage is preferred. - In the event of a fire, fire fighters are recommended not to extinguish the fire with large quantities of water because chemicals may be washed off the site and contaminate other areas and water. Basements of homes are not good storage places for most pesticides, and restricted-use chemicals should NEVER be stored in them.



7. This storage unit satisfies the recommendations for a good storage facility:

- Separate from other buildings.
- Building material and design are fire resistant and a fire extinguisher is found inside along with smoke detectors and alarms.
- Electricity can be shutoff from the outside.



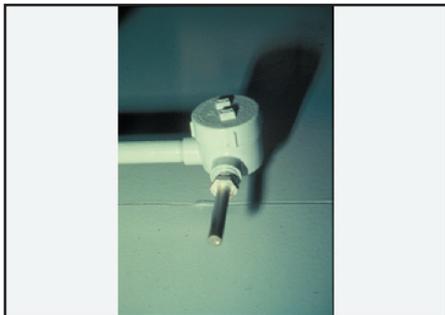
8. This portable storage unit is self-contained, well labeled, ventilated and has its own heat.



9. This is a farmer-built storage pole barn in preliminary stages. Notice the floors and roof.



10. Use fire-resistant building materials when constructing a storage facility. The materials do not necessarily have to be fireproof, but construction materials and design should delay the spread of fire.



11. A sensor for fire protection set at 165 degrees F will set off an alarm and sprinkler system to contain small fires.



12. It is a good idea to hook up the sensor to an alarm siren on the outside of the building where it can be readily seen, informing people when something is wrong. This sensor can also be hooked up to indicate when the storage area temperature is below freezing.



13. The sensor will activate a sprinkler inside the building to contain small fires. Fire codes may require these in the future.



14. Seal the floor of the facility with a recommended epoxy, enamel, or similar seal. Several commercial products are specifically made for sealing containment floors. Be sure the sealer you select will hold up to the chemicals you store.



15. This floor has been sealed.



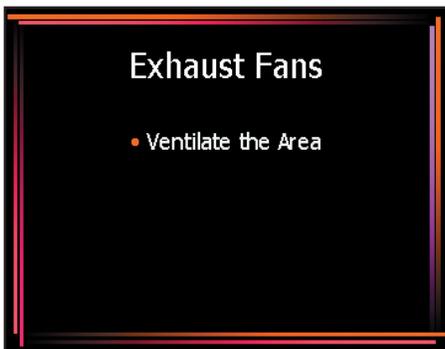
16. Floor curbing will help control spread of spills.



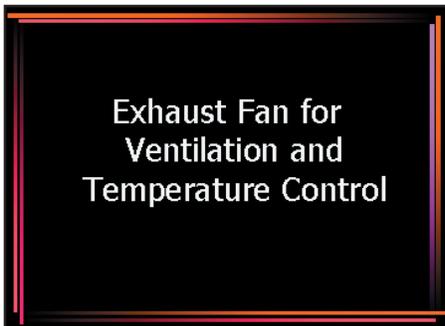
17. Corner curbing is critical and best installed at the same time as the floor, in one slab.



18. Floor drains must **not** be connected to the wastewater sewer or septic tank. Sump drains must direct spilled water or liquids to a holding tank until it can be used or disposed of properly.



19. Exhaust fans are necessary to reduce fumes and dust. It is recommended that 3 to 6 air changes occur per hour with a minimum ventilation rate of 150 cubic feet per minute. Fans may be wired to turn on when the light switch is turned on, or may operate continuously on low speed and shift to high speed when lights are turned on and the room is occupied.



20. Exhaust fans are also used for ventilation and temperature control, keeping temperature variations to a minimum.



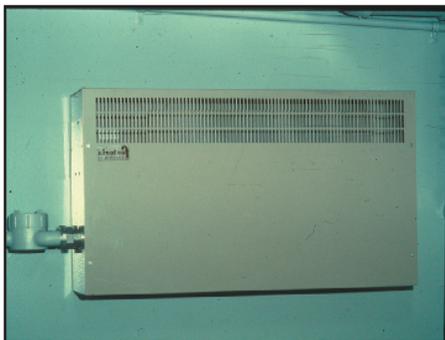
21. This exhaust fan is drawing air from near the floor and/or pit area.



22. The air inlets for the fans should be placed near the floor to pick up heavy pesticide vapors.



23. Provide a separate heat source to prevent pesticides from freezing. Store pesticides at a safe distance from the heat source. You don't want pesticide storage air circulating to other parts of the storage shed and work area.



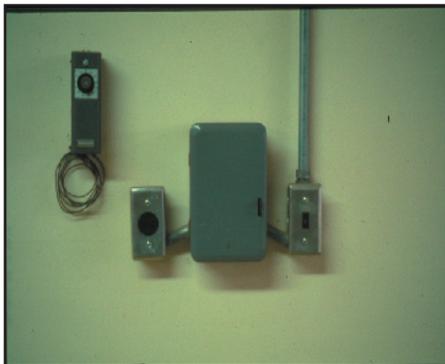
24. This is a small electric heater. Open flame heaters are not recommended and may not be permitted.

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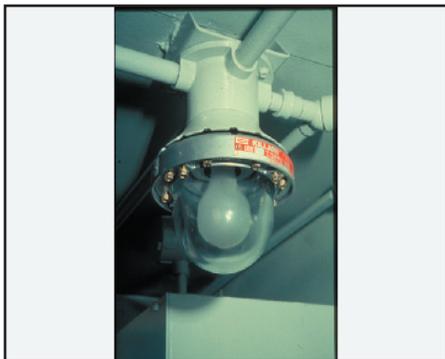
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## Explosion-Proof Electrical Fixtures May Be Required

25. Explosion-proof electrical fixtures may be required. Check the local building codes and consult with an inspector.



26. This electrical connection is designed and wired to be explosion-proof.



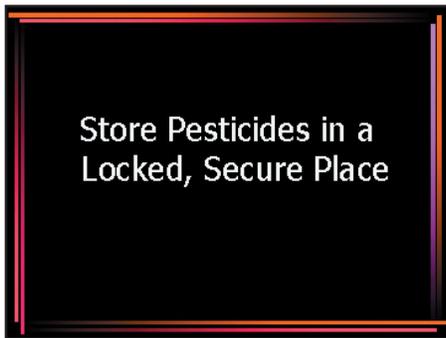
27. Explosion-proof light fixtures may add expense to the building, but are important features of the storage area.

## Chemical Flash Points

28. Chemical flash points give an indication of how readily a chemical may burn. It is the lowest temperature at which the chemical may ignite in air. Chemicals with higher flash points are less flammable or hazardous than those with lower flash points. Persons responsible for the storage area should know the flash points of the chemicals being stored--have an MSDS sheet available for each chemical. Segregate highly flammable chemicals from less hazardous ones. Chemicals stored above their flashpoints require explosion-proof electrical service.



29. Use local building codes. - Check with a local building inspector or zoning office for details.



30. Store pesticides in a locked, secure place.



31. Notice this secure lock and the warning sign in two languages.



32. This sign has National Fire Protection Association (NFPA) codes that indicate what is stored in the building.



33. One type of Department of Transportation (DOT) placard.



34. Wood shelving can absorb chemical spills and leaks and will sag if subjected to much weight. Wood can be used if it properly treated with epoxy or similar paint and not subjected to excessive weight.



35. Use metal storage shelves to prevent absorption of spills and allow for easier clean up.



36. A well designed storage facility with metal shelving.

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**Provide Some Secondary Containment**

37. Provide some secondary containment to control small spills, protect against leaky containers, and to allow for faster and easier cleanup.



38. Inexpensive pans may serve as secondary containment for small containers.



39. This is how the pans work on a shelf. Notice the dates put on these containers by the grower.



40. Dry materials could be stored in plastic containers with lids. These closed containers help reduce odors. Be sure you are in a well ventilated area when opening these storage containers.



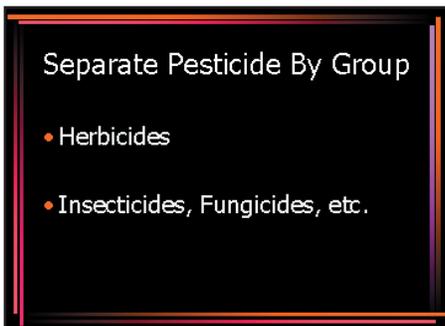
41. Secondary containment should also be used to catch drips.



42. Store your inventory of ag-chemicals according to local, state, and federal fire protection codes (NFPA 30 and NFPA 395).



43. "Consult labels for special storage instructions."



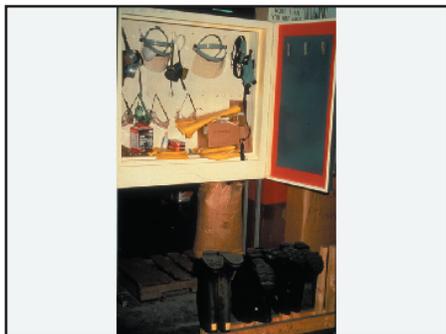
44. Separate pesticides by group. Provide separate storage areas keeping herbicides separate from insecticides and fungicides, etc.

Do Not Store Pesticides With:

- Food
- Feed
- Potable Water
- Seeds
- Protective Equipment

45. Do **not** store pesticides with..."

- Food.
- Feed.
- Potable water.
- Seeds.
- Protective equipment.



46. Personal protective equipment should be stored away from pesticides.

Never Place Pesticide Containers in Windows

47. Never place pesticide containers in windows.



48. When pesticides are exposed to the light and heat coming through windows, they can break down faster and possibly fall off the ledge.

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### Store Pesticides in Original Containers

- Never Repackage Pesticides
- Always Keep the Label Fixed to the Container

49. Store pesticides in original containers.



50. If a chemical bag breaks during transport or handling, put it in another container making sure the label is clearly visible.

### Keep Pesticides Out of Reach of Children, Pets, Livestock and Irresponsible People

51. Keep pesticides out of reach of children, pets, livestock and irresponsible people.



52. Every year there are about 30 to 35 pesticide-related deaths in the U.S.; 50% are suicides and 25% are accidental poisonings of children. Always keep pesticides in their original containers with labels attached.





57. This person is well suited with personal protective equipment (PPE) and ready to assist with the clean up of a pesticide spill.



58. This is one type of absorptive material that can be used to clean up liquid spills. Once the material is used it can spread at recommended rates on a labeled site.



59. These tools are used for cleaning up spills of dry materials, or liquid spill after it has been absorbed with a proper material, cat-box filler, absorbent pellets or pads, etc.



60. Mini-bulk storage is a container holding more than 55 gallons but not exceeding 300 gallons. Mini-bulk containers are designed for ready handling and transport and are filled by the chemical manufacturer or licensed repackaging facility. Proper labeling is required.



61. Loading pads that are properly constructed and managed will help achieve the goal of containing and handling pesticide rinsate, surplus, and accidental spills.



62. This clean loading pad area had a reinforced concrete pad with sealed joints, drive-over curbs and operating floor sumps.



63. This curb was built with a drive-over design. This style of curb can be used for a loading pad or storage building.



64. This is a containment barrier. During mixing and loading the valve is shut. While it is raining and the area is not in use the valve is open.



65. This spray tank has been equipped with an auxiliary tank of water so the sprayer can be cleaned in the field. This practice leaves the chemical in dilute form in the target area and prevents the build-up of chemicals at the loading pad. Change the locations in the field where you rinse equipment. Clean water should run all the way through the spray system.



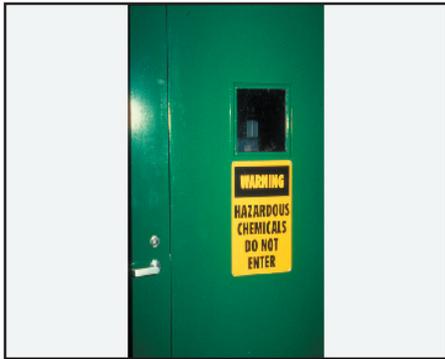
66. Always wear appropriate personal protective equipment when working near or with pesticides and pesticide equipment.



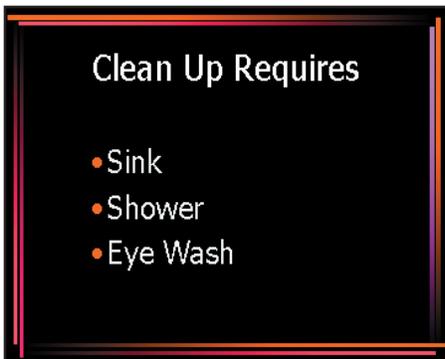
67. Have a chemical-approved fire extinguisher.



68. This approved chemical fire extinguisher is readily accessible.



69. Be sure that all the buildings are locked and properly labeled with warning signs.



70. Clean up requires:  
-sink,  
-shower, and  
-eye wash equipment.



71. The sink area should have a supply of soap.



72. Showers and eye wash stations may be hand or foot operated. Be sure all persons working in the area know how they operate.



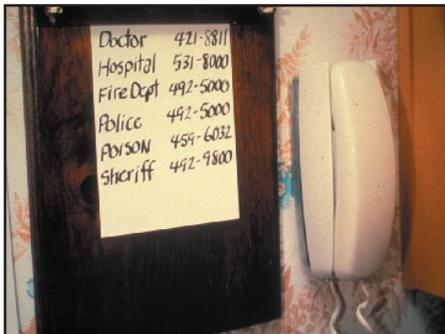
73. This portable eye wash can be taken to the field or to the victim if they are immobilized.



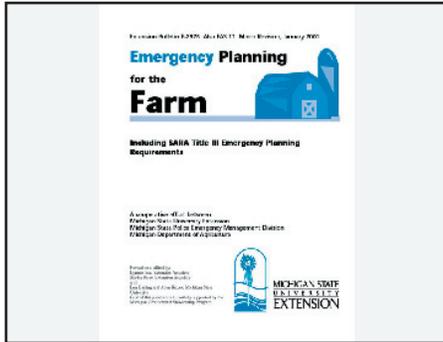
74. First aid kits should be easy to access.



75. Keep a list of emergency phone numbers readily available.



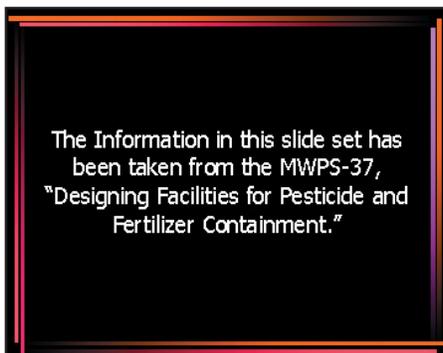
76. Keep emergency telephone numbers by the phone and update them regularly.



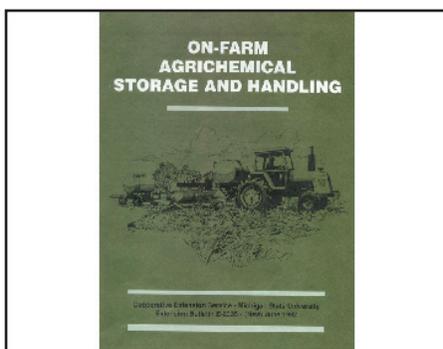
77. Growers must follow **SARA TITLE III** guidelines for proper storage and emergency planning. Obtain a copy of E-2575.



78. Farmers should, give the local fire department and emergency response coordinator a list of materials, quantity and floor plan of the storage facility. This allows the local emergency planning committee and fire department to plan for fires and other disasters.



79. The information in this slide set has been taken from the MWPS-37, "Designing Facilities for Pesticide and Fertilizer Containment."



80. More information on this subject can be found in the "On-farm Agri-chemical Storage and Handling," Extension Bulletin E-2335, by Robert Wilkinson, Agricultural Engineering Department, MSU, East Lansing, Michigan.