

**CHECKLIST  
FERTILIZER STORAGE**

- ✓ Store fertilizers separate from other chemicals in dry conditions.
- ✓ Extra care needs to be given to concentrate stock solutions. Secondary containment should be used.
- ✓ Provide pallets to keep large drums or bags off the floor. Shelves for smaller containers should have a lip to keep the containers from sliding off easily. Steel shelves are easier to clean than wood if a spill occurs.
- ✓ If you plan to store large bulk tanks, provide a containment area large enough to confine 125 percent of the contents of the largest bulk container.
- ✓ Keep the storage area locked and clearly labeled as a fertilizer storage area. Preventing unauthorized use of fertilizers reduces the chance of accidental spills or theft. Labels on the windows and doors of the building give firefighters information about fertilizers and other products present during an emergency response to a fire or a spill.
- ✓ Provide adequate road access for deliveries and use, and in making the storage area secure, also make it accessible, to allow getting fertilizers and other chemicals out in a hurry.
- ✓ Never store fertilizers inside a wellhouse or a facility containing an abandoned well.

## **FERTILIZER STORAGE AND HANDLING**

Greenhouse fertilizer storage areas contain concentrated nutrients that must be stored and managed properly. Fertilizers can cause harm if they reach surface or ground water. Excessive nitrate concentrations in drinking water can cause health risks, especially in young children. Phosphorus can be transported to surface waters and cause algae blooms and eutrophication; resulting in poor water quality. Storing fertilizers separate from other chemicals in dry conditions can minimize these risks. Extra care needs to be given to concentrate stock solutions. Secondary containment should always be used.

Untimely application of fertilizer leads to excessive release from the production system to surface and/or ground water. Potential problems can be minimized through adequate environmental awareness, employee training, and emergency preparedness. Below are guidelines for properly storing and handling greenhouse fertilizers.

### **Storage Location**

Greenhouse fertilizer storage areas contain relatively large quantities of concentrated chemicals. Risks in storage areas include release through broken, damaged, or leaking containers; loss of security leading to irresponsible use; accumulation of outdated materials leading to excessive quantity of fertilizer thus unnecessarily raising risk level; and combustion of oxidizing compounds in fertilizer (e.g., nitrates) caused by fire or another disaster event.

The least amount of risk involves having a building or area dedicated to fertilizer storage; separated from offices, surface water, neighboring dwellings and bodies of water; separate from pesticides and protected from extreme heat and flooding. The storage area should have an impermeable floor with secondary containment, away from plant material and high traffic areas. Clean-up equipment should be readily available.

Storage areas should not contain pesticides, or other greenhouse chemicals; storage areas may contain general greenhouse supplies; there should be no food, drink, tobacco products, or livestock feed present.

- Provide pallets to keep large drums or bags off the floor. Shelves for smaller containers should have a lip to keep the containers from sliding off easily. Steel shelves are easier to clean than wood if a spill occurs.
- If you plan to store large bulk tanks, provide a containment area large enough to confine 125 percent of the contents of the largest bulk container.
- Keep the building or storage area locked and clearly labeled as a fertilizer storage area. Preventing unauthorized use of fertilizers reduces the chance of accidental spills or theft. Labels on the windows and doors of the building give firefighters information about fertilizers and other products present during an emergency response to a fire or a spill. It is a good idea to keep a separate list of the chemicals and amounts stored. If a fire should occur, consider where the water used to fight the fire will go and where it might collect. For example, a curb around the floor can help confine contaminated water.

- Provide adequate road access for deliveries and use, and in making the storage area secure, also make it accessible, to allow getting fertilizers and other chemicals out in a hurry.
- Never store fertilizers inside a wellhouse or a facility containing an abandoned well.

Sound containers are your first line of defense against a spill or leak. If a container is accidentally ripped open or knocked off a shelf, the spill should be confined to the immediate area and promptly cleaned up. The building should have a solid floor and, for liquid fertilizers, a curb. The containment volume should be large enough to hold the contents of the largest full container.

### **Containers**

Fertilizer should be stored in their original containers unless damaged; labels should be visible and readable; food or beverage containers should never be used for storage. Labels should be in plain sight; no containers should come in contact with floor; all containers should be stored upright; aisles should be wide enough to comfortably accommodate workers; containers should not be crowded on shelves or pallets.

#### **Partially-used Containers**

Paper bags and boxes should be opened with a box cutter or scissors; open containers should be resealed and returned to storage; all open paper bags should be sealed inside another, larger container, sealed and labeled.

#### **Damaged Containers**

Containers should be checked often for damage; when damaged containers are noticed, contents should be repackaged and labeled or placed in suitable secondary containment which can be sealed and labeled.

### **Containment**

There should be no floor drain; the floor should provide containment in the event of a spill; there should be secondary containment routinely used for most open containers; damaged or leaking containers should be repaired and/or replaced as soon as possible; all spilled material should be cleaned up upon discovery; and cleanup materials should be discarded promptly and properly.

### **Fire Prevention and Suppression**

Fire detection and alarm system should be present; oxidizers and flammable materials should be stored separately; fire extinguisher should be immediately available; the fire department should be notified at least annually of current inventory.

### **Inventory and Recordkeeping**

Inventory should be actively maintained as chemicals are added or removed from storage; containers should be dated when purchased; outdated materials should be removed on a regular basis; inventory should be controlled to prevent the accumulation of excess material that may become difficult to use

**Lighting**

Electrical lighting should allow view into all areas and cabinets within the storage area.

**Monitoring**

There should be monthly inspection of storage for 1) signs of container corrosion or other damage - leaking or damaged containers should be repackaged as appropriate, 2) faulty ventilation, electrical, and fire suppression systems – problems should be reported and corrected.

**Security**

The storage room should be locked and access restricted to trained personnel.

**Signage**

There should be signs posted; warning signs should be used as needed; emergency contact information should be posted.

**Temperature Control**

There should be active mechanical temperature control and no direct sources of heat (sunny windows, steam pipes, furnaces, etc.).

**Ventilation**

Mechanical ventilation should be working and used.

**Storage and Record Keeping**

Fertilizer stock tanks should be labeled with fertilizer formulation and concentration; records should be kept of fertilizer formulation, concentration, date, and location of application; records should be kept of media nutrient analyses.

**Containment of Concentrated Stock**

Concentrated stock should be stored near the injector in high density polyethylene or polypropylene containers with extra heavy duty walls; secondary containment should be provided.

**Disposal**

Sufficient planning should be made to eliminate the need for disposal; empty fertilizer containers should be discarded based on latest advice from environmental protection authorities.

**Precipitate and Residue Disposal**

Fertilizer systems should be cleaned. Solids and rinse solution should be composted.

**Spill Prevention and Preparedness**

Opening fertilizer product containers, measuring amounts, and transferring fertilizer to the delivery system involves some level of risk from spills. Secondary containment should be used for fertilizer stock tanks routinely; spill clean-up materials should be used for liquids (e.g., absorbent materials) and solids (e.g., shovel, dust pan, broom and empty and/or buckets) should be available within the general area.

## **Delivery System**

The fertigation equipment should be checked monthly for accuracy; containment tanks, back flow preventors and any equipment that holds fertilizer in the dry or liquid form should be inspected; stock tanks should be inspected weekly for deterioration and cracks; the manufacturer recommendations should be followed when calibrating or working on fertilizer injector equipment; stock solution tanks and the areas surrounding fertilizer injectors and concentrated solutions should be kept clean and free of debris.

## **References**

*AEM Tier II Worksheet, Fertilizer Storage & Handling in the Greenhouse*, Agriculture Environmental Management (AEM)

<http://www.agmkt.state.ny.us/SoilWater/aem/forms/Greenhouse%20Fertilizer%20Storage.pdf>

*Pesticide and Fertilizer Storage*, United States Environmental Protection Agency

<http://www.epa.gov/oecaagct/ag101/pestfertilizer.html>