

OKLAHOMA

# Farm & Ranch\*A\*Syst

## Fact Sheet 3

### Reducing the Risk of Ground Water Contamination by Improving Fertilizer Storage and Handling

This fact sheet addresses two areas of fertilizer management that can reduce the risk of contaminating your ground water—fertilizer storage and fertilizer handling. Fertilizer storage and handling are important because a spill could pose a direct threat to your farm's drinking water supply. Storing and handling fertilizers properly can dramatically reduce the risk of spills. When safely and securely stored, fertilizers pose little risk to ground water.

Proper handling practices should address mixing and loading (including site selection), spill cleanup, and container disposal. The term "fertilizer" in this fact sheet refers to any dry or liquid fertilizer, but does not include anhydrous ammonia. All users of fertilizers should read and follow label directions. The fertilizer label provides the applicator with information about efficient, safe, and legal use.

#### *Fertilizer Storage*

The fertilizer storage facility must keep fertilizers cool, dry, secure, and accessible for use. Reduce the need to store fertilizers by buying only the amount you need. This will reduce the risk of a spill. Carefully estimating current needs and maintaining an accurate inventory will help. Always store fertilizers away from high-traffic areas that might damage containers and cause spills. Consider how fertilizers can be protected and use the oldest fertilizers

first. Finally, treat dry fertilizer mixed with a pesticide as a pesticide (see Fact Sheet 2).

Fertilizers should never be stored with fuels or other combustibles. Consider where the surface runoff water from fire fighting will go and where it might collect if a fire should occur. A curb around a sealed floor can help confine the water. A secondary containment dike should be constructed to keep water from flowing off the immediate site. Any contaminated water should be collected for proper disposal or use.

The fertilizer storage must be designed to contain spills. Primary containment is the container that holds the fertilizer. Secondary containment is an area designed to contain all spills without contaminating the floor, soil, or environment.

#### *Storage Facilities*

Consider the benefits of a new fertilizer storage facility versus modifying an old facility. On a short-term basis, an existing building can be used for fertilizer storage, but a special purpose fertilizer storage facility is recommended in the long term to provide proper containment and to reduce risk. The following points should be considered:

\* **Site Selection.** Locate the building downslope and at least 100 feet from any water wells, streams, or water bodies and out of any flood plain. Separation from wells should be

greater if the site has sandy soils or fractured bedrock near the land surface. The site should have proper drainage and stability to ensure that a containment pad will not be subject to stresses from soil movement.

- \* **Storage Environment.** Keep the storage environment cool, dry, secure, and separate from other activities, such as livestock housing or a workshop.
- \* **Primary Containment.** Sound containers are the first defense against leaks. Fertilizer containers should be stored separately from other chemical products.
- \* **Secondary Containment.** An impervious floor, such as coated steel or sealed concrete (unsealed concrete is not impervious to all liquids), will prevent fertilizers from seeping into the ground. The floor should be curbed and sloped to a sump to prevent spills from spreading to other areas. Containment for bulk tanks can be difficult because the containment must be large enough to hold more than the content of the tank plus the displaced volume of any other storage tanks and equipment in the containment area. Regulations require the actual net containment volume to be 110 percent of the contents of the largest bulk container. If the structure is also used for pesticides, there must be separate containment for them.

- \* **Security.** The building, bins, cabinets, and valves on large tanks should be locked to prevent unauthorized entry or use of fertilizers. In making the storage secure, also make it accessible to allow easy access to fertilizers and equipment so they can be removed quickly in an emergency.
- \* **Signs or Labels.** Identify fertilizer storage areas for emergency response personnel. Labels and/or material safety data sheets (obtained from the dealer) should be available outside of the building to give firefighters information about fertilizers during a fire or spill response. Make sure containers are clearly labeled.

## Handling

Without a suitable containment facility, ground water contamination can result from spills in the mixing and loading area. Small quantities of fertilizer spilled regularly in the same place can go unnoticed, but the nutrients can contaminate the soil and eventually reach ground water. By mixing and loading on an impermeable surface such as a sealed concrete pad, you can contain and reuse most spilled fertilizers.

## Mixing and Loading

### 1. Site (mixing/loading pad description).

Containing fertilizer spills and leaks requires an impervious (liquid-proof) surface with a provision to contain wash water or spills. The mixing/loading pad should be large enough to contain leaks from bulk tanks located on the pad, wash water from cleaning equipment, any spills that occur while transferring fertilizers to the sprayer or spreader, and rainwater if the facility is not roofed or inside a building. The pad should also provide adequate space around parked equipment for washing and rinsing. Finally, roofing will minimize the need for storm water runoff prevention measures.

### 2. Practices (managing the mixing and loading site).

Even if you don't have an impermeable mixing and loading pad, you can minimize soil and ground water contamination by following some basic guidelines:

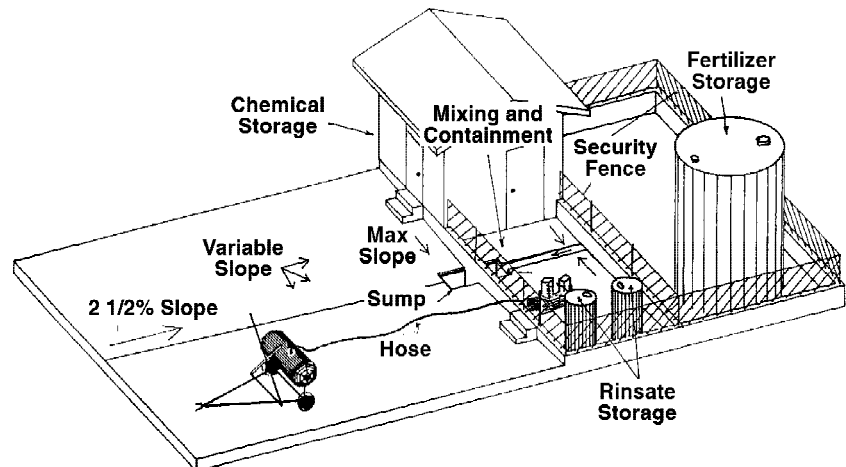
- \* Do not mix and load fertilizers near any well, stream, or body of water. One way to do this is to use a nurse tank to transport water to the field to mix and load near the area of application. Another method is to use a hose to supply water some distance from the well.
- \* Relocate mixing and loading sites frequently to avoid concentrating spills in one area.
- \* Install an AWWA approved backsiphon prevention device on the well or hydrants to prevent reverse flow of contaminated liquids into the water supply. The pump drawing water from a pond or stream should also have a backsiphon device. Alternately, provide a six-inch air gap between the hose outlet and the top of the sprayer tank. Never place the hose in the applicator tank while filling.

- \* Always monitor tank filling on liquid fertilizer applicators.
- \* Use rinsate as mixing water on subsequent loads.

## Spill Cleanup

Refer to the fertilizer label for specifics on cleaning up spills. Oklahoma law requires that spills of any amount in streams or lakes be reported. In the event of spills or leaks on soil, report concentrated product spills greater than one quart or tank mix solution greater than five gallons. Report spills of smaller quantities if they may cause damage because of the specific compound or spill location.

- \* To report a spill, call the 24-hour emergency hotline of the Oklahoma Department of Environmental Quality at 800-522-0206.
- \* For dry spills, promptly sweep up and reuse the fertilizer as it was intended. Dry spills are usually very easy to clean up. Dry impregnated fertilizer is considered a pesticide. If spilled, it should be recovered and applied to the target crop as it was intended.
- \* For liquid spills, recover as much of the spill as possible and reuse as it was



**Figure 1.** Farm-sized fertilizer facility. (Source: D.W. Kammel and D. O'Neil. "Farm-Sized Mixing/Loading Pad and Agri-chemical Storage Facility." Paper presented at the summer meeting of the American Society of Agricultural Engineers, June 24-27, 1990.)

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intended. Remove contaminated soil and spread very sparingly over the field, if possible.

**Have an emergency response plan for each site. Have the proper equipment on hand to clean up spills. Know how to handle your particular fertilizers and whom to call for help.**

### *Container Disposal Practices*

Follow label instructions for container disposal. Unwashed and improperly stored containers can lead to ground water contamination by allowing fertilizer residues to leach into the ground. Some basic guidelines that can help avoid these problems are:

- \* Never dispose of fertilizer containers in abandoned wells, cisterns, pit silos, sink holes, or other excavations.
- \* Empty returnable containers and keep them dry and out of the weather.
- \* Pressure-rinse or triple-rinse disposable plastic containers immediately after use, since residue can be difficult to remove after it dries. Pour rinse water into the spray tank after rinsing.

Puncture containers and store them in a dry covered area until you can take them to an authorized landfill or recycling center.

- \* Recycle properly rinsed plastic and metal containers through fertilizer container recycling programs if available. See your fertilizer dealer or county Extension agent for information.
- \* Bind or wrap empty bags to minimize dust and take them to an authorized landfill. Do not bury or burn fertilizer containers or bags on the farm.
- \* Do not accumulate excess quantities of containers.

### *Where to call about...*

#### **Fertilizer Spills—**

Oklahoma Department of Environmental Quality, 800-522-0206 (state-wide 24-hour emergency hotline).

U.S. Environmental Protection Agency, 800-424-8802 (national 24-hour hotline).

#### **Plans and Recommendations for Fertilizer and Loading Pads—**

Your county Extension office.

#### **Proper Disposal of Soil Contaminated by a Fertilizer Spill—**

The Oklahoma Department of Agriculture, 405-521-3864.

#### **Drinking Water Quality and Treatment and Health Advisories—**

EPA Safe Drinking Water Hotline, Monday through Friday, 8:00 a.m. to 4:30 p.m. (CST), 800-426-4791.

County Extension office.

County health department environmental specialist.

Oklahoma Department of Environmental Quality, 405-271-4468.

### *What to read about...*

*Nitrates in Soil and Water.* OSU Extension Facts F-2242.

*Knowing When to Fertilize.* OSU Extension Facts F-2236.

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Extension carries out programs in the broad categories of agriculture, natural resources, and environment; home economics; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

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- Extension programs are nonpolitical, objective, and based on factual information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
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- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

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