

Fact Sheet 3

Reducing the Risk of Groundwater Contamination by Improving Fertilizer Storage & Handling

1. Fertilizer storage practices

If stored safely in a secure location, fertilizers pose little danger to groundwater. Common sense suggests keeping fertilizer dry and out of the way of activities that might rip open a bag or allow rain to enter a bulk container.

Locate fertilizer storage areas downslope and at least 400 feet away from your well to provide reasonable assurance well water will not be contaminated. Separation from the well should be greater in areas of sand or fractured bedrock. Worksheet 8, *Site Evaluation* can assist you in ranking your farmstead soils and geologic conditions by their ability to keep contaminants out of groundwater.

Managing your existing storage facility

Compared to the cost of a major accident or even a lawsuit, storage improvements can be a bargain. The cheapest alternative you may have is to cut back on the amount of fertilizer stored. If that option is not practical, consider how you can protect the fertilizers you keep on hand.

- A locked storage cabinet or building provides security by reducing the chance of accidental spills or theft. Provide signs or labels indicating the cabinet or building is a fertilizer storage area.
- Sound containers are your first defense against a spill or leak. Should a bag be accidentally ripped, fertilizers should be confined to the immediate area and promptly recovered.
- Provide pallets to keep bags off floor. Store dry products separate from liquids to prevent wetting from spills.
- If you plan to store large bulk tanks, provide a large-enough containment area to confine 110 percent of the contents of the largest bulk container, plus the displaced volume of any storage tanks.

Ideally, your fertilizer storage area should be separate from other activities. If the building must also serve as a machine shed or as housing for livestock, you may find it difficult to meet all the requirements for safe storage.

Fires in a storage area can pose a danger to firefighters and to the environment. Reducing the fire risk in the storage area may be the first step, but other things can be done. You can reduce the damages by anticipating such emergencies. Label windows and doors to alert firefighters to the presence of fertilizer stored in the structure.

If a fire should occur, consider where the water will go and where it might collect. A curb around the floor can help confine contaminated water. In making the storage area secure, also make it accessible, allowing you to get fertilizers out in a hurry.

*For glossary,
see page 2 of
Worksheet 3.*

Building a new storage facility

While a new facility just for fertilizer storage may be expensive, it may be safer than trying to adapt areas meant for other purposes. Keep the principles in mind that were mentioned above. Safe storage can minimize the risk of accidents and spills around your fertilizer storage area.

In the event of an accident, an impermeable (waterproof) floor, such as coated or sealed concrete, helps to prevent fertilizer seeping into the ground and leaching to groundwater. A curb built around liquid fertilizer storage areas will prevent contaminants from spreading to other areas.

Secondary containment provides an impermeable floor and walls around the storage area, which will minimize the amount of fertilizer seeping into the ground if a bulk liquid fertilizer storage tank should leak.

A mixing/loading pad provides for secondary containment during the transfer of liquid fertilizer to application equipment or nurse tanks. Store piles of dry bulk fertilizer on an impermeable surface under cover or in a building. Treat dry fertilizer impregnated with a pesticide, as a pesticide. Store under cover or protected from rain.

For information on factors to consider in designing a storage facility, such as ventilation, temperature control and worker safety, contact your county Extension office or Extension Agricultural Engineering, (913) 532-5813, for plans and recommendations.

2. Mixing and loading practices

Groundwater contamination can result from small quantities spilled regularly in the same place. Spills of dry fertilizer should be promptly and completely cleaned up and placed immediately into the application equipment. Cleaning up spills of liquid fertilizers can be much more difficult.

Better management of your existing mixing and loading site

Liquid fertilizer spills and leaks are bound to occur from time to time. Even if you don't have an impermeable mixing and loading pad, you can minimize contamination by following some basic guidelines:

- Avoid mixing and loading fertilizers near your well. One way to do this is to use a nurse tank to transport water to the mixing and loading site. Ideally, the site should be moved within the field of application.
- Avoid mixing and loading on gravel driveways or other surfaces that allow spills to sink quickly through the soil. A clay surface is better than sand or gravel.
- Install an anti-backsiphon device on the well or hydrants. Never put the hose in the sprayer tank. Provide an air gap of six inches between the hose and the top of the sprayer tank.
- Always supervise sprayer filling.
- Consider using a closed handling system, in which the fertilizer is directly transferred from the original container to the application equipment, such as by a hose. Humans and the environment are not inadvertently exposed to the fertilizer.
- Apply final rinsate to the field being fertilized.

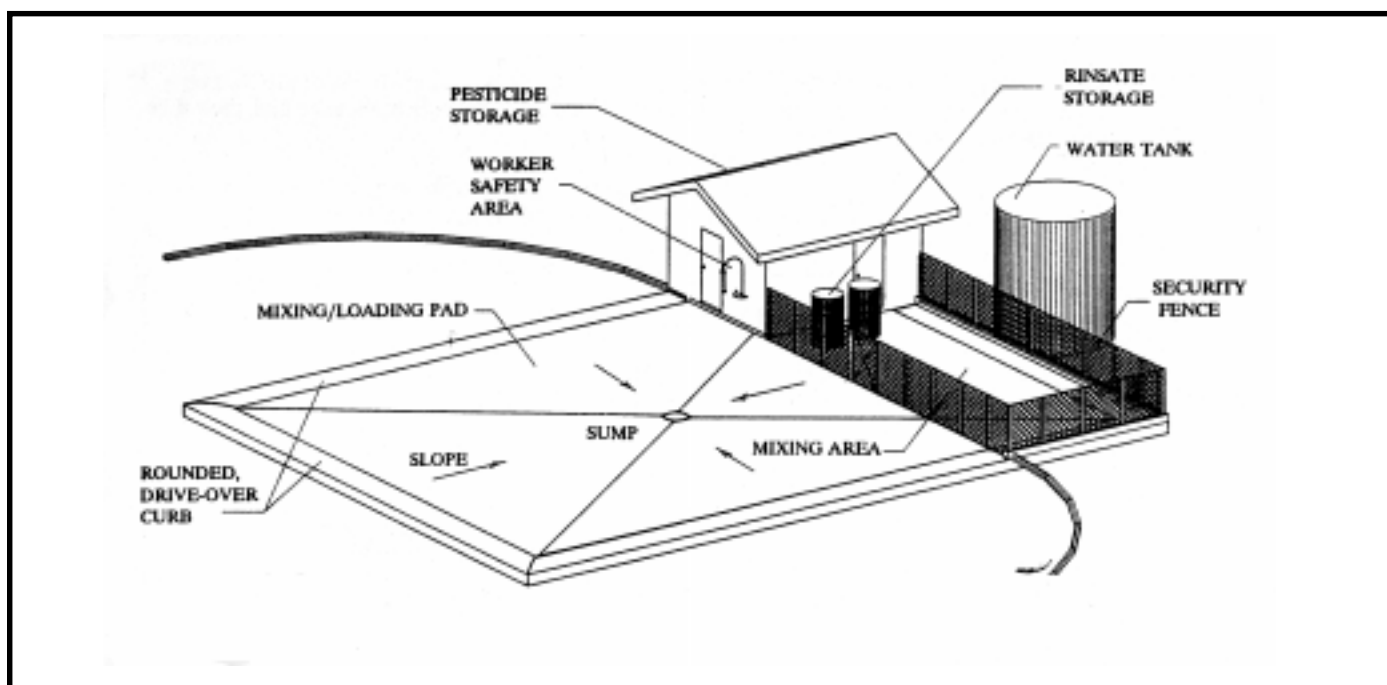


Figure 1: Small-scale drive-across pesticide/fertilizer facility. Source: *Designing Facilities for Pesticide and Fertilizer Containment*, MWPS-37, Midwest Plan Service, Ames, Iowa, 1991.

A liquid fertilizer mixing and loading pad

Containing liquid fertilizer spills and leaks requires an impermeable surface (such as coated or sealed concrete) for mixing and loading. A concrete pad should be large enough to accommodate your equipment and to contain leaks from bulk tanks, wash water, and spills from transferring fertilizers to the sprayer (see Figure 1).

Locate the pad adjacent to the storage area. At sites where runoff could reach the well, construct a diversion to direct runoff to another area.

The size of the pad depends on the equipment you use. It should provide space around the parked equipment for washing and rinsing. The fertilizers and rinse water should have a confined area, such as a sump, for settling before transfer to rinsate storage tanks. Having several separate rinsate storage tanks allows you to keep rinse water from different fertilizer chemical mixes separate. That way, it can be used for mixing water on subsequent loads.

If you are considering constructing a mixing/loading pad, more detailed information is available from county Extension offices or Extension Agricultural Engineering, (913) 532-5813.

3. Spill cleanup

For dry spills, promptly sweep up and use the fertilizer as it was intended. Dry spills are usually very easy to clean up. Dry impregnated fertilizer is considered a pesticide and, if spilled, 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 use as it was intended. Some contaminated soil may be required to be removed and field applied if possible.

Contact your county Emergency Preparedness Coordinator or other emergency response authority to report, and to receive advice and assistance in remediating a spill.

The KDHE Bureau of Environmental Remediation, (913) 296-1679, or the Kansas State Board of Agriculture, (913) 296-2142, can also provide assistance and should be contacted in the event of a fertilizer spill.

Have an emergency response plan for the site. Know where the runoff water will go, how to handle your particular fertilizers, and whom to call for help.

Kansas State Board of Agriculture: Fertilizer Containment Regulations

Regulations dealing with the containment of commercial fertilizer at storage facilities were initiated to protect groundwater from fertilizer product contamination. Each storage facility already in place and meeting the following requirements is subject to the regulations: 1) facilities with 5,000 gallons or more storage capacity; and, 2) Facilities through which a volume of 125 tons or more of liquid fertilizer or 25 tons or more of dry fertilizer is received into or transferred out of during any 365-day period. Any new facilities to be built with 2,000 gallons or more storage capacity are also subject to the regulations. There is no farmer exemption.

The above-mentioned storage facilities are required to have at least one loading pad or area, as well as diking, to contain any spilled material.

For additional information regarding fertilizer containment requirements, contact the Kansas State Board of Agriculture, 901 S. Kansas Avenue, Topeka, Kansas 66612, (913) 296-3786.

4. Container disposal practices

Bulk deliveries of anhydrous ammonia, liquid fertilizers and dry fertilizers have reduced the need to dispose of containers. Many farmers do, however, use bagged fertilizers. Empty bags should be bundled and disposed of at least 400 feet away from your well and preferably in an approved landfill.

Your drinking water is least likely to be contaminated by your disposal practices if you follow appropriate management procedures or dispose of fertilizer wastes in any location that is **off the farm site**. However, proper offsite disposal practices, such as an approved landfill, are essential to avoid risking contamination that could affect the water supplies and health of others.

5. Other management factors

Reducing fertilizer waste makes financial as well as environmental sense, but it means more than just reducing spills. It also means not buying more than you need to apply and keeping records of what you do have on hand. Buying only what you need makes long-term storage unnecessary.

Keeping records may seem like a task unrelated to groundwater contamination, but knowing what you've used in the past and what you have on hand allows you to make better purchasing decisions. Keep records of past field application rates and their effectiveness.

CONTACTS AND REFERENCES

Who to call about...

Plans and recommendations for fertilizer mixing and loading pads

Your county Extension office or Extension Agricultural Engineering, (913) 532-5813.

Fertilizer spills and proper disposal of soil contaminated by a fertilizer spill

Your local Emergency Preparedness Coordinator, the Kansas Department of Health and Environment at (913) 296-1679, or the Kansas State Board of Agriculture at (913) 296-2142.

Health effects of nitrates in drinking water

Kansas Department of Health and Environment, Topeka, Kansas, (913) 296-5500. With specific questions, contact your local health department.

Drinking water quality and treatment

EPA Safe Drinking Water Hotline, Monday through Friday, 7:30 a.m.–4 p.m. Central Standard Time. Call 1(800) 426-4791.

What to read about...

Publications are available from sources listed at the end of the reference section. (Refer to number in parentheses after each publication.)

Groundwater contamination, protection and testing

Nitrates and Groundwater. MF-857. (1)
Managing the Farmstead to Minimize Groundwater and Well Contamination. MF-948. (1)
Groundwater and Well Contamination. MF-932. (1)
Safe Domestic Wells. MF-970. (1)
Pesticides in Drinking Water. MF-961. (1)
Ensuring Safe Drinking Water. MF-952. (1)
Suggested Water Tests for Private Systems. MF-871. (1)
Taking a Water Sample. MF-963. (1)
Testing to Help Ensure Safety of Drinking Water. MF-951. (1)
Commercial Laboratories Certified for Water Quality Tests. MF-872. (1)
Understanding Your Water Test Report. MF-912. (1)

Health effects

The product label. Read your product labels carefully for specific information on fertilizer health effects.

Nitrates and Groundwater: A Public Health Concern. Freshwater Foundation. (4)

Fertilizer storage, handling, disposal and safety

Designing Facilities for Pesticide and Fertilizer Containment. Midwest Plan Service. MWPS-37. (2)

Anhydrous Ammonia Safety. Tabloid. MF-990. (1)

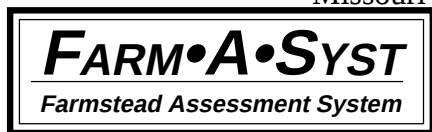
Constructing an Inexpensive Ag Chemical Rinse Pad. ACRE Fact Sheet #14. (5)
Discusses capturing wastewater, storage of chemicals, site selection, and the design of a simple rinse pad.

Disposing of Crop Protection Chemical Containers. ACRE Fact Sheets #5 and #12. (5)
Fact Sheet #5 provides an eight-point checklist of procedures to follow for safe disposal of chemical containers. Fact Sheet #12 discusses pressure-rinsed and triple-rinsed containers and rinsed container disposal.

Chemicals in Your Community: A Guide to the Emergency Planning and Right To Know Act. 1988. U.S. Environmental Protection Agency. (3)
Pages 26-27 contain information on implications of this law for farmers.

Publications available from...

1. Your county Extension office or directly from Extension Distribution Center, Umberger Hall, Kansas State University, Manhattan, Kansas 66506, (913) 532-5830. There may be charges for the publications, postage and sales tax.
2. Your county Extension office or the Midwest Plan Service Secretary, Extension Agricultural Engineering, 237 Seaton Hall, Kansas State University, Manhattan, Kansas 66506, (913) 532-5823.
3. U.S. Environmental Protection Agency (EPA), Office of Pesticide Programs (TS-766C), 401 M Street S.W., Washington, D.C. 20460.
4. Freshwater Foundation at Spring Hill Center, 725 County Road 6, Wayzata, Minnesota, (612) 449-0092.
5. Alliance for a Clean Rural Environment (ACRE), P.O. 413708, Kansas City, Missouri 64141, 1(800) 545-5410.



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