



Water is Life : Quality Matters



# HOW TO PROTECT YOUR WATER FROM FERTILIZER CONTAMINATION

**Fact Sheet 3**  
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Proper storage, handling and application of fertilizers on farmsteads or acreages are essential to protect water sources from chemical contamination. Excessive application rates, spills in storage areas, and seemingly insignificant spills during mixing and loading can lead to fertilizer movement into surface or ground waters.

If contamination reaches drinking water sources, nitrates in the fertilizer can pose serious health risks—especially for infants and young livestock. In addition to health concerns, laws governing nutrients in surface water are being more strictly enforced than in the past. This is in part because fertilizer runoff into surface water can cause excess algae growth and result in fish kills.

For additional information or reading materials, see the Contacts and References section at the end of this fact sheet.

## FERTILIZER STORAGE

If stored safely and in a secure location, fertilizers pose little danger of contaminating ground or surface water. Store fertilizers in a secure, well marked, and well ventilated location that is safe from children, livestock and vandalism. The best storage is in a covered area that provides secondary containment in case of spills. Secondary containment should include curbing around an impermeable floor with no drain. At the very least, fertilizer should be stored on an impervious surface and covered.

Other fertilizer storage guidelines include:

- Label and keep records on fertilizer products for easy identification and tracking.
- Store fertilizers away from flame, ignition, fuel and water sources.
- Consider potential for flood, fire, or other disasters before storing fertilizers.

# MIXING AND LOADING PRACTICES

Ground water contamination can result from small spills around storage, mixing, or loading areas. Small quantities spilled regularly in the same place may not be noticed at the soil surface. The chemicals can accumulate in the soil, however, and eventually reach groundwater, or can be carried in surface runoff to streams through ditches and other drainages.

When mixing liquid fertilizer use an anti-backflow device on the well or hydrants. Never put the hose into the liquid. Keep an air gap of 6 inches between the hose and liquid in tank.

Use rinsate from liquid fertilizer for mixing subsequent loads and reuse spilled dry fertilizer in the next application.

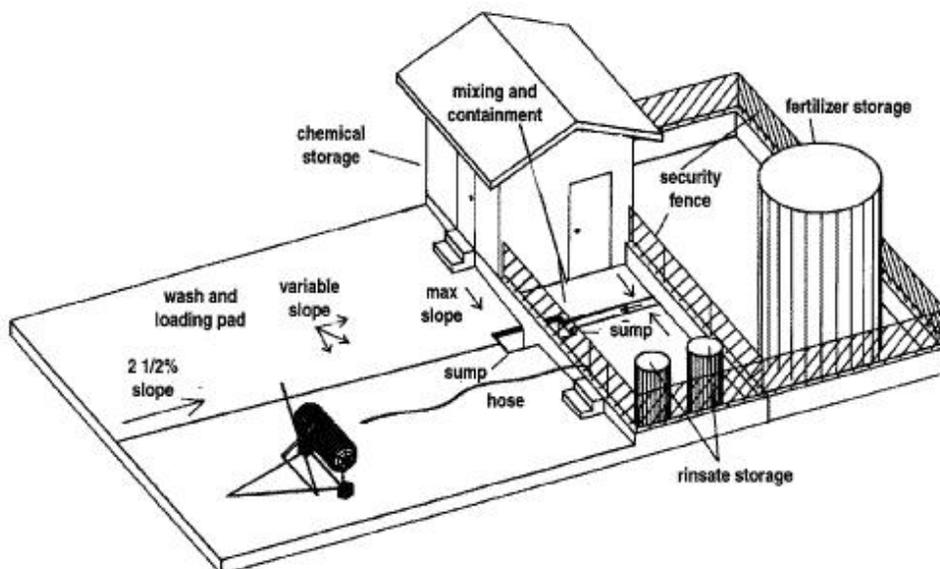
## **TAKE ACTION!**

To contain spills, always mix and load fertilizer on an impermeable surface, such as sealed concrete.



## A Mixing and Loading Pad

The figure below shows one design for a mixing and loading pad. This type of structure minimizes fertilizer transport by placing storage areas close to mixing and loading areas. It also provides an impermeable surface which drains rinse water to a sump so rinsate can be pumped into storage tanks and used for the next load. For dry fertilizers, the loading pad provides a solid surface so spilled fertilizer can easily be swept up and reused. The mixing pad should be large enough to park equipment on with sufficient room to catch spilled fertilizer and water from washing and rinsing.



## Mixing and Loading Practices Without an Impermeable Pad

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

- Avoid mixing and loading fertilizers near your well head or surface waters. With liquid fertilizers use a nurse tank to transport water to the mixing and loading site.
- Move mixing site from year to year (within the field of application).
- Avoid mixing and loading on gravel driveways or sandy surfaces that will allow spills to pass quickly through the soil.
- Always supervise the filling of application equipment.
- Consider using a closed handling system where the fertilizer is directly transferred from the storage container to the application equipment. A closed system protects humans and the environment from exposure.

## Fertilizer/ Pesticide Mixes

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If a fertilizer is mixed with pesticide the handling precautions for both chemicals apply to the new mixture. The pesticide handling precautions are usually more restrictive; therefore, the mixture should be treated as a pesticide. For more information, see Fact Sheet 2 (How to Protect Your Water from Pesticide Contamination).

### **TAKE ACTION!**

Do not mix any two chemicals without reading labels carefully to ensure chemicals are compatible.

Always keep rinse water for different chemicals separate.



## SPILL CLEANUP

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Good mixing practices and sound containers are your first line of defense against spills. Remember that small spills may create a big problem if they occur repeatedly and are not cleaned up. Promptly sweep up dry spills and reuse the fertilizer as intended. Recover as much of a liquid spill as possible and reuse as intended.

Large spills that may threaten surface water sources should be reported to the Department of Environmental Quality, Division of Environmental Response and Remediation (DERR). In some situations, contaminated soil might need to be removed and applied to a field using specific procedures approved by the DERR.

## Emergency Response Plan

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Take time to create your own emergency spill response plan. Make a list of emergency phone numbers, and decide ahead of time what your best plan of attack will be.

### **TAKE ACTION!**

Have an Emergency Response Plan

Know where the runoff water will go and how to handle your particular fertilizers.

Post phone numbers of your county Disaster and Emergency Services office.



## **CONTAINER DISPOSAL**

Bulk deliveries of anhydrous ammonia, liquid fertilizers and dry bulk fertilizers have reduced the need to dispose of containers. If you do use bagged fertilizers, the best practice is to dispose of containers off-site at a sanitary landfill, which is the safest way to reduce risk to water.

## **MANAGEMENT FACTORS**

The best way to determine how much fertilizer is necessary is to test your soil. Considerations for determining appropriate fertilizer application rates include your soil type, crop type, manure usage, irrigation methods, and existing nutrient levels in the soils. Soil nutrient testing is available through the Utah State University Analytical Laboratory. See the Contacts and References section below for contact information for the laboratory and for additional publications on the fertilizer requirements of various crops.

### **Nutrient Management Plan**

To avoid excess application it is important to develop a nutrient management plan for your farmstead or acreage. The plan accounts for nutrients going into

### **TAKE ACTION!**

Get your soil tested for nutrients.

Keep records of past fertilizer applications.

Buy only what you need, make long term storage unnecessary.

**SAVE MONEY, REDUCE FERTILIZER WASTE**

and coming out of your soil from fertilizer, manure application and irrigation water. This requires soil tests, calculations of nutrients applied as manure, and nutrients removed in harvest. This nutrient accounting approach ensures that you are not applying more fertilizer than necessary, which saves you money and protects water resources from contamination.

### **Recordkeeping**

The task of recordkeeping may not seem to be related to contamination of water, but knowing what you've used in the past and what you have on hand allows you to make better purchasing and management decisions.

# CONTACTS AND REFERENCES

## **NUTRIENT BUDGETS, APPLICATION RATES, AND SOIL TESTING**

Contact your Utah State University county Extension agent through your local phone book or (435) 797-2200 online at <http://extension.usu.edu/htm/counties>.

Utah State University Analytical Lab: (435) 797-2217 or <http://www.usual.usu.edu>.

## **PLANS AND RECOMMENDATIONS FOR FERTILIZER MIXING AND LOADING PADS**

Contact your Utah State University Extension county agent through your local phone book or (435) 797-2200 or on the web: <http://extension.usu.edu/htm/counties>.

MidWest Plan Service, Iowa State University, 122 Davidson Hall, Ames, Iowa 50011-3080: (800) 562-3618 or on the web at: <http://www.mwps.org/>

## **FERTILIZER SPILLS**

Utah Department of Agriculture and Food: (801) 538-7100 or on the web at [www.ag.utah.gov](http://www.ag.utah.gov).

National Response Center hotline: Call toll free (800) 424-8802.

Utah Division of Environmental Response and Remediation: (801) 536-4100; 24-hour hotline: (801) 536-4123.

## **HEALTH EFFECTS**

### **PROJECT COORDINATED BY:**

Nancy Mesner, Utah State University. Written by Leonard Massie, Department of Agricultural Engineering, University of Wisconsin-Madison, and University of Wisconsin Extension, Cooperative Extension. Adapted for use in Utah by an interagency team from materials prepared by Montana State University Extension Service, Kansas State University and Purdue University Extension Service. The Farmstead Assessment System is a cooperative project of Utah State University Extension, Utah Department of Agriculture and Food, Utah Department of Environmental Quality, Utah Farm Bureau, Utah Association of Conservation Districts, Natural Resources Conservation Service.

### **UTAH FARM A-SYST ADVISORY COMMITTEE AND REVIEW TEAM:**

Howard Deen, John Harrison, Robert W. Hill, Rich Koenig, Nancy Mesner, - Utah State University Extension; Kerry Goodrich - Natural Resources Conservation Service; Mark T. Novak - Division of Water Quality, Utah Department of Environmental Quality; Bob Lowe - Division of Drinking Water, Utah Department of Environmental Quality; Mark Quilter - Utah Department of Agriculture and Food; Mark M. Petersen - Utah Farm Bureau; Utah Association of Conservation Districts.

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Mike Allred, Thomas E. Bingham, Kitt Farrell-Poe, Roy Gunnell, Krista Kuester, Dean Maxwell, Stephen E. Poe, W.D. Robinson, Jay Roundy, Adam Siggler and Kyle Peterson Koyle.

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Check all product labels carefully for specific information on fertilizer health effects.

### **MORE READING:**

*Fertilizer and Manure Application Equipment Code NRAES-57*

Midwest Plan Service (800) 562-3618

*Utah State University Fact Sheets:*

\* *Fertilizer Management for Alfalfa*

\* *Management Intensive Grazing Systems & the Environment*

\* *Selecting & Using Inorganic Fertilizer (HG 509)*

\* *Selecting & Using Organic Fertilizer (HG 510)*

Utah State University Extension Publications: (435) 797-2251

or <http://extension.usu.edu/cooperative/publications>

### **OTHER QUESTIONS?**

Contact USU Extension's Water Quality Program: (435) 797-2580

or on the web at <http://extension.usu.edu/waterquality/>

# GLOSSARY

These definitions may help clarify some terms used in this Fact Sheet and may also help you make more accurate assessments when completing the Utah Farmstead Assessment for Ground Water and Surface Water Protection Survey 3 (Landowner's Survey: What's the Risk to Your Water from Fertilizer Contamination?)

**AIR GAP:** An air space between the hose or faucet and water level, representing one way to prevent backflow of liquids into a well or water supply.

**ANTI-BACKFLOW (ANTI-BACK SIPHONING) DEVICE:** A check valve or similar mechanical device used to prevent the unwanted reverse flow of liquids back down a water supply pipe into a well.

**BACKFLOW:** The unwanted reverse flow of liquids in a piping system.

**BACK SIPHONAGE:** Backflow caused by formation of a vacuum in a water supply pipe.

**CLOSED HANDLING SYSTEM:** A system for transferring fertilizers directly from storage container to application equipment (e.g. through a hose).

**MIXING AND LOADING PAD:** An impervious surface designed to capture spilled fertilizer and water from washing and rinsing. This type of pad allows for the collection of rinsate and spilled fertilizer for proper disposal rather than allowing it to move into the soil.

**NUTRIENT MANAGEMENT PLAN:** A plan for tracking nutrients entering and leaving your soil. This includes an accounting of nutrients applied as manure or fertilizer, and nutrients removed in the form of crops. This type of a plan can help you determine how much fertilizer is necessary to reach optimal levels in your soil.

**PRIMARY CONTAINMENT:** The bags, barrels, or bins which are the first level of containment of fertilizers. This level of containment keeps fertilizer from being exposed to soil or to weather which could allow for transport to ground or surface water.

**RINSATE:** The water used to wash fertilizer application equipment.

**SANITARY LANDFILL:** A landfill specifically designed to protect ground water through the use of a high quality clay or other impervious film liner, accompanied by a system of buried pipes to collect any liquids generated. Meets state standards. Also called licensed landfill.

**SECONDARY CONTAINMENT:** Impervious floor and curbs around a chemical storage area that minimize the amount of chemical seeping into the ground from a spill or leak.

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