NebGuide

University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

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G2054

Protecting Private Drinking Water Supplies: Pesticide and Fertilizer Storage and Handling

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This publication is one of six in a series designed to help rural families protect their private drinking water supplies. The greatest protection of drinking water supplies can be achieved by applying principles from all publications in the series.

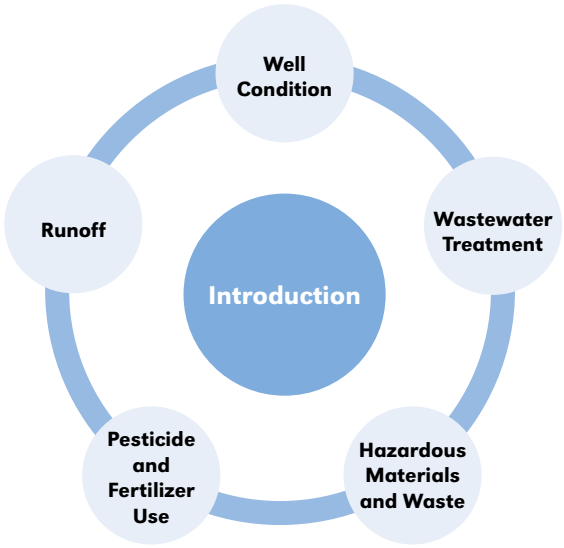

Figure 1. This NebGuide is one of six in a series designed to help rural families protect their drinking water supplies. All are available on the UNL Extension Publications website under the topic Water Management.

Pesticides and fertilizers can play an important role in management of rural areas. However, if not stored, mixed, and used safely, these products can degrade water quality for drinking purposes. Careful management of pesticides and fertilizers will help keep the groundwater that supplies your drinking water safe.

Pesticides can be toxic to people and animals. Exposure to high concentrations in drinking water for even a short period of time can result in acute health problems. A pesticide concentration in drinking water high enough to cause acute poisoning is rare, and would most likely be the result of a spill or back-siphon accident during which concentrated product entered the well. Exposure to low doses of pesticides in drinking water over a long period can result in chronic health problems. Long-term exposure to pesticides can cause cancer, birth defects, or organ injuries. When found in water supplies, pesticides typically occur in trace levels.

Fertilizer is a major source of nitrate. Nitrate-nitrogen levels exceeding the public health standard of 10 milligrams per liter (mg/l; equivalent to parts per million for water measure) have been found in many drinking water wells. Nitrate levels in drinking water above the drinking water standard can pose a risk of methemoglobinemia (blue baby syndrome). Infants under 6 months of age are particularly susceptible to methemoglobinemia from high nitrate-nitrogen levels. Nitrate also can affect adults, but the evidence is much less certain.

Careful management of pesticides and fertilizers on your property will minimize the risk of groundwater contamination. Implementing good storage, mixing, and application practices will help keep the groundwater that supplies your drinking water safe.

Begin by completing the following assessment.

Respond to the following statements. Check only those that accurately describe your pesticide and fertilizer management practices. Unchecked statements indicate factors that could put your drinking water supply at risk of contamination. Although voluntary, risk factors should be addressed. Attempt to eliminate risk factors when possible.

Following the assessment is additional information to help you understand the associated risks.

Purchases and Storage

___ Purchases are planned so that materials will be used in the near future.

___ Quantities purchased are only enough for the immediate job.

___ Records are kept of fertilizers and pesticides in storage.

___ Dry pesticides or fertilizers are stored for less than two weeks.

___ Dry pesticides or fertilizers remain in clearly labeled original packaging.

___ Packaged dry pesticides or fertilizers are stored in watertight, covered containers.

___ Storage facility floor is waterproof, such as sealed concrete or asphalt.

___ Any spills are cleaned up properly and immediately.

___ Storage facility is locked and has signage.

Mixing

___ Pesticides or fertilizers are mixed at least 100 feet downslope from any well.

___ Materials are mixed according to label directions, in quantities that can be used for the application so there is no excess in need of disposal.

___ Anti-backflow device is used when mixing pesticides and fertilizers, or a 6-inch air gap is maintained between the mixing container and the hose or other water source.

___ A responsible adult is present at all times supervising the mixing and filling of spray equipment.

Application

___ All label directions are followed.

___ Sprayers are washed out in the area where the product was applied.

___ Application is kept away from wells and areas that drain toward wells.

Pesticide and Fertilizer Purchase and Storage

Plan purchases of pesticides and fertilizers. Don't be tempted to buy in volume to get the lower cost per unit. A product on a storage shelf poses a risk, and unwanted or unneeded products present disposal problems.

Reducing pesticide and fertilizer waste makes financial as well as environmental sense. Buy no more than is needed to apply, keep records of what you have on hand, and use older products first.

Buying only what is needed makes long-term storage unnecessary. In addition, you avoid cold weather storage problems, which can make some chemicals useless. If you must store pesticides and fertilizers, store liquids on lower shelves and dry formulations on upper shelves. This reduces spill risk and the likelihood that a leaking liquid will contaminate dry material. Common sense suggests keeping products dry and out of the way of activities that might puncture or knock over a jug or rip open a bag or box. If stored safely in a secure location, the risk to groundwater is greatly reduced.

It is against the law to store a pesticide in any container other than the original container. A child could confuse a pesticide stored in a bottle or jug with a beverage. Also, important information regarding mixing, application, and safety measures are on the original containers.

If a liquid spill does occur, an impermeable (waterproof) floor, such as sealed concrete, should virtually eliminate any seepage of chemicals into the ground. Putting a curb around the floor will prevent chemicals from spreading to other areas. Cleanup should be immediate because many products can penetrate and be absorbed into concrete. Have cleanup supplies such as cat litter, a shovel, and a plastic temporary storage container nearby to collect and contain a liquid spill.

A locked storage cabinet or building provides security. Preventing unauthorized access to pesticides and fertilizers reduces the chance of accidental exposure, spills, or theft. Post signs or labels identifying the cabinet or storage area. Label windows and doors to alert firefighters to the presence of chemicals stored in the facility.

Mixing Pesticides and Fertilizers

Groundwater contamination can result even from small quantities spilled regularly in the same place. Will you mix products on the same spot for more than 13 days in a calendar year? Will you handle concentrated pesticides in containers greater than 2.5 gallons? Will you mix quantities greater than 100 gallons? If so, Title 198 requires using a mixing/loadout pad with an impermeable surface (such as concrete). Using an impermeable mixing pad is a good idea regardless of the quantities of pesticide you use or the number of days in a year you use them. The concrete pad should be large enough to accommodate your equipment and to contain leaks, wash water, and spills. The size of the pad also depends on the equipment you use. It should provide space around the equipment for washing and rinsing. If possible, locate the mixing pad next to the storage area. Spills should be promptly and completely cleaned up and placed immediately into the application equipment.

You cannot totally eliminate all spills and leaks, but you can minimize contamination if one does occur, even if you do not have an impermeable mixing pad, by following these guidelines:

Avoid mixing products near your well. One way to do this is to use a nurse tank to transport water to the mixing site. Ideally, the mixing site should be moved each year within the field of application.

Avoid mixing on gravel driveways or other surfaces that allow spills to percolate quickly through the soil.

Install a back-siphon prevention device on hydrants to prevent reverse flow of liquids into the water supply. Never

put the hose in the tank. Provide an air gap of 6 inches between the hose and the top of the tank.

Always supervise sprayer filling.

For dry spills, promptly sweep up and use the product as it was intended.

For liquid spills, recover as much of the spill as possible and use as it was intended. If this is not possible, use a clay absorbent material such as cat litter to absorb the liquid, and put in a plastic temporary storage container. Dispose of the material according to the pesticide label directions.

Check the Material Safety Data Sheet (MSDS) that accompanies the product for other cleanup recommendations.

Nebraska Department of Environmental Quality Title 126 requires reporting pesticide and fertilizer spills as follows:

- Pesticide or fertilizer spills of any amount to streams or lakes.
- Concentrated pesticide spills of 1 quart or more to the soil or a mixing pad.
- Dilute pesticide solution spills of 5 gallons or more to the soil or a mixing pad.
- Fertilizer spills greater than 50 gallons to the soil or a mixing pad.
- Pesticide or fertilizer spills of smaller quantities if they can cause damage because of the specific compound or spill location.

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

Acute emergency situations, such as spills or releases of petroleum products or hazardous substances, are to be immediately reported by telephone to:	
Monday - Friday From 8:00 a.m. to 5:00 p.m.	**DEQ** (402) 471-2186 (877) 253-2603
After hours, weekends, and holidays	**Nebraska State Patrol Dispatch** (402) 471-4545

Pesticide and Fertilizer Application

Follow all directions listed on the pesticide label or fertilizer container.

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

Using older products first keeps your inventory current and effective. However, before using chemicals that have been stored for a few years, check with your local University of Nebraska–Lincoln Extension educator about possible restrictions on their use.

Additional References

Pesticides And Groundwater County Guides: *snr.unl.edu/data/water/pestguides.asp*

Title 198 Rules and Regulations Pertaining to Agricultural Chemical Containment, Water Quality Division

Acknowledgments

This publication is the result of a collaborative effort between the University of Nebraska–Lincoln Extension, the Nebraska Department of Environmental Quality, Nebraska Department of Health and Human Services, the Nebraska Well Drillers Association, and the Nebraska On-site Waste Water Association, all of whom place a high priority on protecting Nebraska's drinking water resources.

This publication was modified from the University of Nebraska–Lincoln Extension publications EC98-768, "Farm*A*Syst: Pesticide Storage and Handling", EC 98-767, "Farm*A*Syst: Improving Pesticide Storage and Handling", EC98-770, "Farm*A*Syst: Fertilizer Storage and Handling", and EC98-769, "Farm*A*Syst: Improving Fertilizer Storage and Handling" which were adapted from material prepared for the Wisconsin and Minnesota Farm*A*Syst programs.

Partial funding was provided by the Nebraska Well Drillers Association, the Nebraska On-site Waste Water Association, and the Water Well Standards and Contractors' Licensing Board.

This publication has been peer reviewed.

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Issued June 2011