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# EC98-768 Farm\*A\*Syst Nebraska's System for Assessing Water Contamination Worksheet 4: Pesticide Storage and Handling

Robert Grisso  
*University of Nebraska at Lincoln*

DeLynn Hay  
*University of Nebraska at Lincoln, dhay@unlnotes.unl.edu*

Paul J. Jasa  
*University of Nebraska at Lincoln, pjasa1@unl.edu*

Richard K. Koelsch  
*University of Nebraska - Lincoln, rkoelsch1@unl.edu*

Sharon Skipton  
*University of Nebraska-Lincoln, sskipton1@unl.edu*

*See next page for additional authors*

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**Authors**

Robert Grisso, DeLynn Hay, Paul J. Jasa, Richard K. Koelsch, Sharon Skipton, and Wayne Woldt

# Farm A Syst

WORKSHEET 4

Nebraska's Farm Assessment System for Assessing the Risk of Water Contamination

## Pesticide Storage and Handling

### Why should I be concerned?

Pesticides are showing up where they're not wanted—in our drinking water. If pesticides are not handled and stored correctly around the farm, they can seep through the ground after a leak or spill, or enter a well directly during mixing and loading.

Pesticides play an important role in agriculture. They have increased farm production and enabled farmers to manage more acres with less labor. Taking voluntary action to prevent pesticide contamination of groundwater will help ensure their continued availability for responsible use by farmers.

Pesticides work by interfering with the life processes of the target pests. Pesticides can be toxic to people. If pesticides enter a water supply in large quantities—as can happen with spills or backsiphonage accidents—**acute health effects** (toxic effects apparent after only a short period of exposure) can

range from moderate to severe, depending on the toxicity of the pesticide and the amount of exposure, and can include chemical burns, nausea, and convulsions. Contaminated groundwater used for drinking water supplies may result in **chronic exposure** (prolonged or repeated exposure to low doses of toxic substances), which may be hazardous to people and livestock. Long-term exposure to pesticides can cause cancer, birth defects, or organ injuries.

Some pesticides are “restricted use” and require certification before use. Following the label and guidelines found in pesticide application training will help prevent contamination due to improper use and storage.

When found in water supplies, pesticides typically occur in trace levels. The concern is primarily because of their potential to cause chronic health problems from prolonged exposure.

Your drinking water is least likely to be contaminated if you follow appropriate management procedures or dispose of wastes in any location that is **off the farm site**. However, proper offsite disposal practices are essential to

avoid risking contamination that could affect the water supplies and health of others.

**The goal of Farm\*A\*Syst is to help you protect the groundwater that supplies your drinking water.**

### How will this worksheet help me protect my drinking water?

- It will take you step-by-step through your pesticide handling, storage, and disposal practices.
- It will rank your activities according to how they might affect the groundwater that provides your drinking water supplies.
- It will provide you with easy-to-understand rankings that will help you analyze the “risk level” of your pesticide handling, storage, and disposal practices.
- It will help you determine which of your practices are reasonably safe and effective, and which practices might require modification to better protect your drinking water.





<p><b>How do I complete the worksheet?</b></p> <p>Follow the directions at the</p>	<p>top of the chart on the next page. It should take you 15-30 minutes to complete this worksheet and determine your risk level.</p>	<p>Information derived from Farm*A*Syst worksheets is intended only to provide general information and recommendations to farmers regarding their own farm practices. It is not the intent of this educational program to keep records of individual results.</p>
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<p>These terms may help you make more accurate assessments when completing <i>Worksheet 4</i>. They may also help clarify some of the terms used in <i>Fact Sheet 4</i>.</p> <p><b>Air gap:</b> An air space (open space) between the hose or faucet and water level in a spray tank, representing one way to prevent backflow of liquids into a well or water supply.</p> <p><b>Anti-backflow (anti-backsiphoning) device:</b> A check valve or other mechanical device to prevent the unwanted reverse flow of liquids back through a water supply pipe into a well.</p> <p><b>Backflow:</b> The unwanted reverse flow of liquids in a piping system or well.</p> <p><b>Backflow prevention device:</b> (See anti-backflow device.)</p> <p><b>Backsiphonage:</b> Backflow caused by formation of a vacuum or reduced pressure in a water supply pipe or hose.</p>	<h2 style="text-align: center;">Glossary</h2> <p><b>Closed handling system:</b> A system for transferring pesticides or fertilizers directly from storage container to applicator equipment (through a hose, for example), so that humans and the environment are not inadvertently exposed to the chemicals.</p> <p><b>Cross-connection:</b> A link or channel between pipes, wells, fixtures, or tanks carrying contaminated water and those carrying potable (safe for drinking) water. Contaminated water, if at a higher pressure, can enter the potable water system.</p> <p><b>Micrograms per liter:</b> The metric weight of a substance measured in micrograms contained in one liter. It is equivalent to 1 part per billion in water measure.</p> <p><b>Milligrams per liter (mg/l):</b> The metric weight of a substance measured in milligrams contained in one liter. It is equivalent to 1 part per million in water measure.</p>	<p><b>Parts per billion (ppb):</b> A measurement of concentration of one unit of material dispersed in one billion units of another material.</p> <p><b>Parts per million (ppm):</b> A measurement of concentration of one unit of material dispersed in one million units of another material.</p> <p><b>Pesticide:</b> A chemical to control, kill, or alter the activity of a pest. Examples: herbicide, insecticide, fungicide.</p> <p><b>Rinsate:</b> Rinse water from pesticide or fertilizer tank cleaning.</p> <p><b>Secondary containment:</b> A chemical storage area with impermeable floor and walls that prevent chemicals from seeping into the ground from a spill or leak.</p>
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# Pesticide Storage and Handling: Assessing the Risk of Surface Water and Groundwater Contamination

1. Use a pencil. You may want to make changes.
2. For each category listed on the left that is appropriate to your farm, read across to the right and circle the statement that best describes conditions on your farm. (Skip and leave blank any categories that don't apply to your farm.)
3. Then look above the description you circled to find your "risk number" (1, 2, 3, or 4) and enter that number in the blank under "YOUR RISK."
4. Allow 15-30 minutes to complete the worksheet and figure out your risk for pesticide storage and handling practices.

	HIGH RISK (risk 4)	HIGH-MODERATE RISK (risk 3)	MODERATE-LOW RISK (risk 2)	LOW RISK (risk 1)	YOUR RISK
<b>PESTICIDE STORAGE*</b>					
Amount stored	More than 55 gallons or more than 550 pounds of each pesticide.	More than 1 gallon or more than 10 pounds of each pesticide.	Less than 1 gallon or less than 10 pounds of each pesticide.	No pesticide stored at any time.	
Water solubility** (Mobility)	Chemicals classified as mobile to very mobile.	Chemicals classified as intermediate mobile.	Chemicals classified as low mobile.	Chemicals classified as immobile.	
Formulation— liquid or dry	All liquids.	Mostly liquids. Some dry.	Some liquids. Mostly dry.	No liquids. All dry.	
Type of storage	No cover. Spills not collected.	Partial cover. Spills not collected.	Covered. Spills not collected.	Covered. Spills are collected.	
Surface of storage facility	Sandy soils.	Loamy soils.	Clay soils.	Impermeable surface (such as concrete or asphalt).	
Spill or leak control in storage area	Permeable surface (gravel or dirt floor). Spills could contaminate floor.	Permeable surface (wooden floor) has some cracks. OR Impermeable surface has no curb. Spills could contaminate wood or soil.	Impermeable surface with curb installed has some cracks, allowing spills to get to soil. OR impermeable surface without cracks has no curb installed.	Impermeable surface (such as concrete) does not allow spills into soil. Curb installed on floor to contain leaks and spills.	
Containers	Containers allow chemicals to leak. <b>No labels.</b>	Containers are patched. Metal containers show signs of rusting.	Original containers are old. Labels partially missing or hard to read.	Original containers in good condition and clearly labeled. No holes, tears, or weak seams.	
Security	Open access to theft, vandalism, and children.	Open to work activities that could damage containers or spill chemicals.	Fenced area separate from most other activities.	Fenced or locked area separate from all other activities.	

**Italic Boldface type:** Besides representing a higher-risk choice, this practice may also violate Nebraska law

\*The same area cannot be used for secondary containment for both pesticide and fertilizer handling.

\*\*See *Fact Sheet 4* for water solubilities of commonly used pesticides in Nebraska.

	HIGH RISK (risk 4)	HIGH-MODERATE RISK (risk 3)	MODERATE-LOW RISK (risk 2)	LOW RISK (risk 1)	YOUR RISK
<b>MIXING AND LOADING PRACTICES*</b>					
Location of well in relation to mixing/loading area with no curbed and impermeable containment area	<i>Within 10 feet downslope or within 100 feet upslope from well.***</i>	<i>10-50 feet downslope from well,*** or 100-500 feet upslope.</i>	<i>50-100 feet downslope from well.***</i>	100 feet or more downslope from well. Mixing is done in the field.	
Mixing and loading pad (spill containment)	No mixing/loading pad. Permeable soil (sand). Spills soak into ground.	Concrete pad with some cracks keeps some spills contained. No curb or sump.	Concrete pad with curb keeps spills contained. No sump.	Concrete pad with curb keeps spills contained. Sump allows collection and transfer to storage OR done in field.	
Backflow prevention on water supply	No anti-backflow device. <b><i>Hose in tank at or below highest water line.</i></b>	No anti-backflow device. Hose in tank above water line.	Anti-backflow device installed. Hose in tank above water line.	Anti-backflow device installed or 6-inch air gap maintained above sprayer tank OR done in field.	
Water source	Obtained directly from well.	Hydrant less than 150 feet from well.	Hydrant greater than 150 feet from well, or separate water tank.	Water tank at field location.	
Filling and mixing supervision	Seldom or never.	Occasional.	Frequent.	Constant.	
Handling system	All liquids and dry products hand poured. Sprayer fill port hard to reach.	All liquids and dry products hand poured. Sprayer fill port easy to reach.	Closed system for most liquids. Some liquids and dry products hand poured. Sprayer fill port easy to reach.	Closed system for all liquid and dry product transfers.	
Sprayer cleaning and rinsate (rinse water) disposal	Sprayer washed out at farm. <b><i>Rinsate dumped at one point at farm or in field. OR Rinsate sprayed over an area less than 100 feet from well.</i></b>	Sprayer washed out at farm. <b><i>Rinsate spread over a field area not in compliance with label.</i></b>	Sprayer washed out on pad at farm. Rinsate used in next load and applied to labeled crop.	Sprayer washed out in field. Rinsate used in next load and applied to labeled crop. Follow all pesticide label information.	

***Italic Boldface type:*** Besides representing a higher-risk choice, this practice may also violate Nebraska law

\*The same area cannot be used for secondary containment for both pesticides and fertilizer handling.

\*\*\*Illegal for new well construction. Existing wells must meet requirements in effect at time of construction.

	HIGH RISK (risk 4)	HIGH-MODERATE RISK (risk 3)	MODERATE-LOW RISK (risk 2)	LOW RISK (risk 1)	YOUR RISK
<b>DISPOSAL OF EXCESS PESTICIDES</b>					
Disposal of excess pesticides (less than 50 lbs. or 5 gal. for moderately toxic pesticides, less than 5 lb. or 1 gal. for highly toxic pesticides)*	<b><i>Drain in one spot.</i></b>	<b><i>Apply to same plant where maximum application rate or permissible residual levels are exceeded OR spread thinly where risk to water quality is unknown.</i></b>	Follow all label restrictions and spread thinly where it is certain product will not present a risk to water quality	Follow all label restrictions and apply to same plant in another location or a different plant for which the product is also registered. Do not exceed maximum application rate and permissible residual levels.	
<b>CONTAINER DISPOSAL</b>					
Disposal location	<b><i>Disposal of partially filled plastic or paper containers on farm.</i></b>	<b><i>Disposal of unrinsed containers or empty bags on farm.</i></b> OR Unrinsed containers and empty bags taken to licensed landfill, municipal incinerator or dump.	<b><i>Disposal of pressure rinsed or triple-rinsed containers on farm.</i></b>	Triple-rinsed or pressure-rinsed containers returned to dealer or taken to licensed landfill. Bags returned to supplier or hazardous waste collection service. Follow all pesticide label information.	

***Italic Boldface type:*** Besides representing a higher-risk choice, this practice may also violate Nebraska law. If you apply pesticides, you should also complete *Worksheet 15, Crop Pest Management*.

\*To the extent possible, it is also recommended that application be the first alternative considered in disposing of larger quantities of pesticides, provided that use remains permissible under current federal, state, and local laws and regulations. A second alternative is to return unopened original containers to the dealer or manufacturer. When disposal by one of these methods is not feasible, contact the Solid Waste Control Division, Nebraska Department of Environmental Quality (DEQ) at 402-471-2186 for information on safe disposal.

**Your groundwater vulnerability score from *Worksheet 2* was \_\_\_\_\_**

Note: If the surface texture, subsurface texture, or depth to groundwater used to calculate this score are not characteristic of the site conditions present for the activities/practices discussed in this worksheet, calculate a new vulnerability score for this site.

If your groundwater vulnerability score is:

- 1 to 1.4: your site has a **LOW VULNERABILITY** to pollution reaching groundwater.
- 1.5 to 2.4: your site has a **MODERATE-LOW VULNERABILITY** to pollution reaching groundwater.
- 2.5 to 3.4: your site has a **HIGH-MODERATE VULNERABILITY** to pollution reaching groundwater.
- 3.5 to 4.0: your site has a **HIGH VULNERABILITY** to pollution reaching groundwater.

**Your surface water vulnerability score from *Worksheet 2* was \_\_\_\_\_**

Note: If the surface texture, slope toward surface water, or distance from surface water used to calculate this score are not characteristic of the site conditions present for the activities/practices discussed in this worksheet, calculate a new vulnerability score for this site.

If your surface water vulnerability score is:

- 1 to 1.4: your site has a **LOW VULNERABILITY** to pollution reaching surface water.
- 1.5 to 2.4: your site has a **MODERATE-LOW VULNERABILITY** to pollution reaching surface water.
- 2.5 to 3.4: your site has a **HIGH-MODERATE VULNERABILITY** to pollution reaching surface water.
- 3.5 to 4.0: your site has a **HIGH VULNERABILITY** to pollution reaching surface water.

**Look over your worksheet scores for individual activities:**

- **Low risk** practices (1's): are ideal and should be your goal regardless of your site's vulnerability to pollution reaching ground or surface water. Cost and other factors may make it difficult to achieve a low risk rating for all activities.
- **Moderate-low risk** practices (2's): provide reasonable water quality protection unless your site's vulnerability to pollution reaching ground or surface water is moderate-high or high.
- **High-moderate risk** practices (3's): do not provide adequate protection in many circumstances, especially if your site's vulnerability to pollution reaching ground or surface water is high or high-moderate. They may provide reasonable water quality protection if your site's vulnerability to pollution reaching ground or surface water is low to moderate-low.
- **High risk** practices (4's): pose a serious danger of polluting water, especially if your site's vulnerability to pollution reaching ground or surface water is high, high-moderate, or moderate-low. Some high risk activities may not immediately threaten water quality if your site's vulnerability to pollution reaching ground or surface water is low, but still pose a threat over time if not corrected.

Read *Fact Sheet 4 Improving Pesticide Storage and Handling* and consider how you might modify your farm practices to better protect your drinking water supply and other ground and surface water supplies. Some concerns you can take care of right away; others could be major or costly projects requiring planning and prioritizing before you take action.



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**NOTES**