

Good Farm Practices Protect Groundwater

There's a lot you can do to protect your groundwater and keep government regulators off your back.

When Bill and Wahnetta Haywood bought their farmhouse 10 years ago in Janesville, Iowa, they tested the water immediately. "The nitrates were running up to 96 ppm [parts per million]," Bill says. The limit set by the EPA is 45 ppm.

Bill, a wildlife conservationist and county weed commissioner on the Black Hawk County Conservation Board, was not surprised by the high reading. The house is surrounded by corn fields, and the soil is underlined with fractured limestone, which promotes leaching of nitrogen into groundwater. Because they had two children, the Haywoods believed they had to rectify their water problem quickly.

High levels of nitrates pose the biggest risk for pregnant women and young children, especially those under six months of age. Nitrates are converted to nitrites, which prevent blood from bonding with oxygen in babies. This results in bluish-tinged skin, thus the term "blue baby syndrome." In rare cases, babies have died from the condition.

The Haywoods' solution was a \$400 distiller. Using a vapor condensation method, it distills purified water into a storage tank. Bill and Wahnetta, who now have five children, distill a minimum of 2 gallons a day for cooking and drinking at about \$1 per day in electrical costs.

A whopping 95% of rural residents depend on groundwater for drinking. Figure in the possibility of pesticides and other contaminants in the water, and you understand why the issue is arguably the most crucial environmental concern in decades. (For background information on this topic, see the series of articles *Progressive Farmer* published from August 1985 through January 1986.)

The public is quick to point an accusing finger at farmers, but much

contamination stems from industrial and even natural (biological) sources. Still, agriculturalists are partially responsible. So what can farmers do to protect this resource?

Test Your Well Water

"First of all, test your water," says Jim Porterfield, associate director for the Natural and Environmental Resources Division of the American Farm Bureau. "I recommend a fairly comprehensive test of well water, including metals, organics, bacteria, nitrates, and pH. The test will give you a baseline if problems arise in the future. Once you have that information, you can begin deciding on future farming practices."

A directory of independent testing facilities is available at no cost from the American Council of Independent Laboratories, 1725 K St. N.W., Suite 412, Washington, DC 20006, phone 1-202-887-5872. For a list of agencies that can provide information about specific water-testing services in your area, send a self-addressed stamped envelope to Clean Water, *Progressive Farmer*, Box 2581, Birmingham, AL 35202.

Two facilities that offer comprehensive tests are National Testing Laboratories, Inc., 6151 Wilson Mills Rd., Cleveland, OH 44143, phone 1-800-458-3330; and Water Test Corp., Box 6360, Manchester, NH 03108, phone 1-800-426-8378. National Testing checks for 93 contaminants, including pesticides, for \$119. This figure does not include return shipping costs. Water Test checks for 101 items and charges \$245, including shipping costs both ways.

Follow Good Farm Practices

Many practices recommended for farm management will help prevent groundwater contamination.

"Integrated Pest Management, for

instance, should figure into every farmer's philosophy and operation," Porterfield says. "Plants will withstand a certain amount of damage without losing yields. It's beneficial for farmers to know when it's economically profitable to treat pests."

Preventing leaks in underground fuel tanks also can stop contamination. "The EPA has tightened down across the country regarding leaking underground storage tanks," says Bill Segars, an Extension agronomist at the University of Georgia. One primary source of this contamination is service stations, he adds.

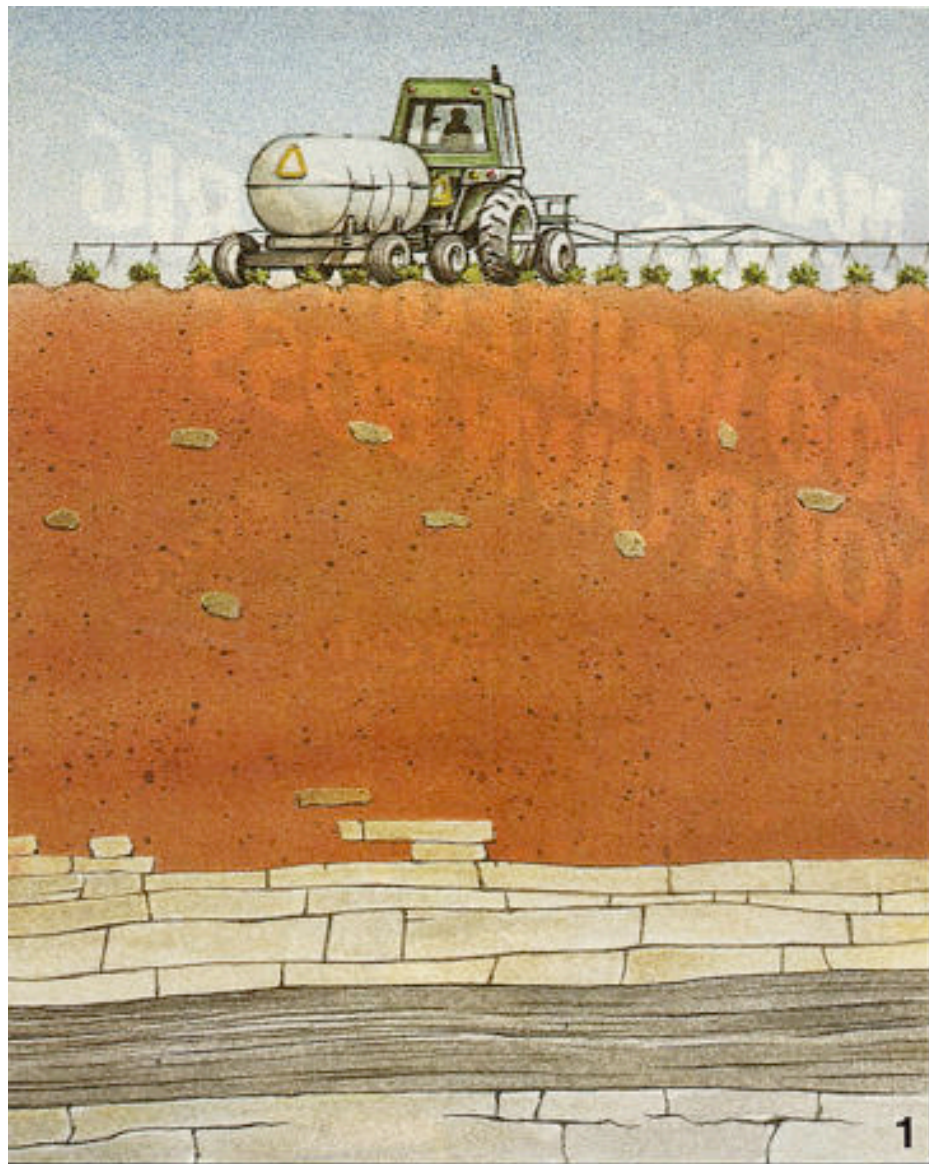
Farmers can make sure leaks aren't occurring on their own land by keeping a record of the amount of fuel stored and the amount used.

Nitrate contamination in Bill Haywood's water most probably came from the commercial nitrogen fertilizer used in the surrounding corn fields. He says the nitrate level in his water dropped drastically when his neighbors stopped production because of Government subsidies. Other sources of nitrates include animal waste runoff, septic tanks, and legumes like alfalfa, soybeans, and clover.

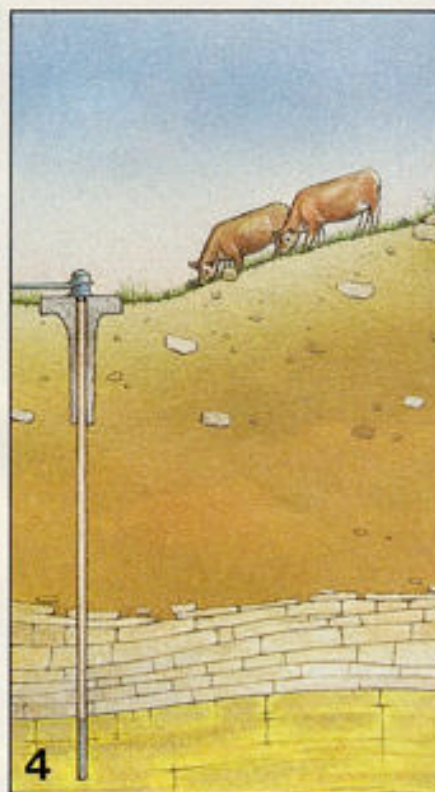
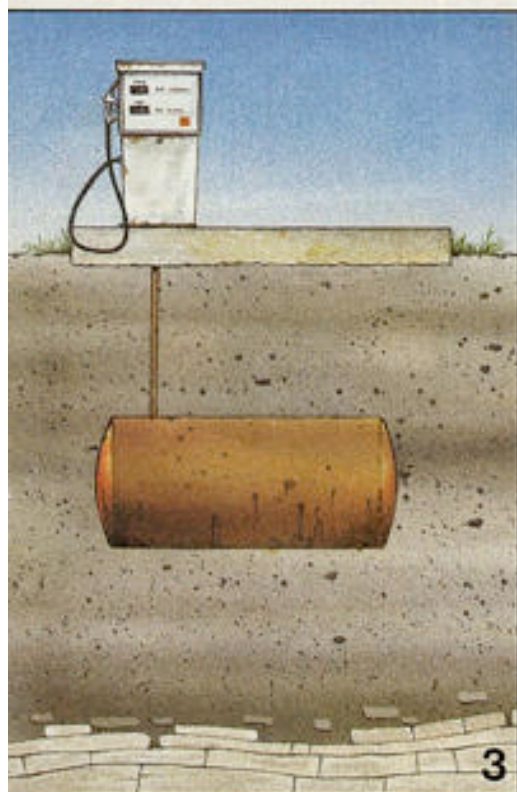
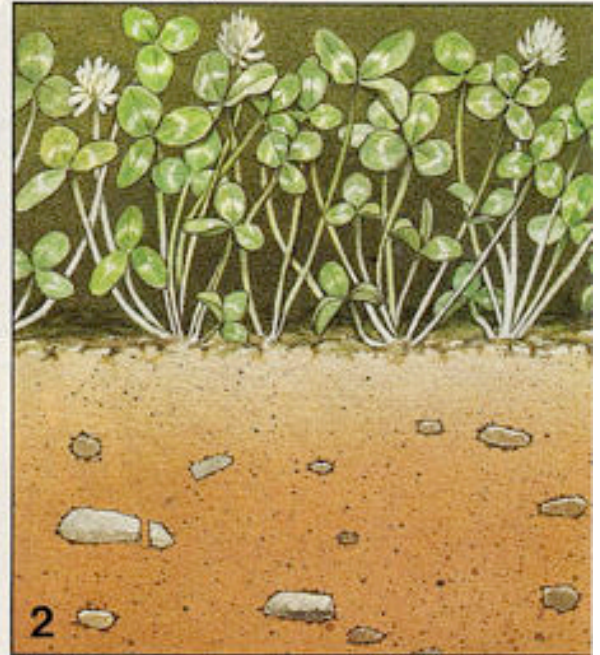
"The big misunderstanding," Porterfield says, "is that the public thinks organic nitrogen won't contaminate groundwater the way commercial nitrogen fertilizer will. It doesn't matter where nitrate comes from. It will leach equally as well once it's in nitrate form."

Pesticides and Soil Types

Generally, highly soluble pesticides—those which easily dissolve in water—are more likely to leach from the soil into groundwater. Pesticides that adsorb—or hold tightly—to soil particles are less likely to leach. Pesticides that degrade quickly are less likely to leach into groundwater.



Excess chemical use (figure 1) is one way groundwater is contaminated. But even nitrogen-producing legumes, such as clover (figure 2), can contribute to the problem and must be considered when figuring fertilizer rates. Leaky underground fuel tanks (figure 3) and constant drips from aboveground tanks can eventually affect groundwater. Wells should not be located at the bottom of a hill (figure 4). This makes them more vulnerable to any polluting source, including animal manure runoff.



The coarser the soil, the greater chance there is that pesticides could reach groundwater. Soil that is sandy and low in organic matter promotes groundwater contamination, but clay and highly organic matter do not. Also, rainy climates or extensively irrigated soil promote pesticide leaching.

Preventive Management Practices

- Use Integrated Pest Management whenever possible. Evaluate your chemical use carefully.
- Choose pesticides that are least likely to leach into groundwater. A list of "priority leachers" is available from the EPA. This list and other information is available from state and county Farm Bureaus. Ask for the "Farm Bureau's Groundwater and Environmental Quality Self-Help Checklist for Farmsteads and Farm Fields."
- Mix, store, and load pesticides at least 100 feet away from wells, pref-

erably on a concrete surface for easy cleanup in case of spills. Don't use chemicals near sinkholes.

- Use backflow prevention devices when filling spray tanks. Allow an air gap between the hose and the water level in the tank. Have a check valve and proper safety equipment on irrigation wells. Be sure irrigation wells are appropriately sealed and cased.
- Rinse containers three times before the residue dries, dumping the rinse water into the spray tank. Puncture the container so that it can't be used again. Dispose of containers in approved landfills.
- Don't dump rinse water into or near ditches, streams, ponds, lakes, or any other body of water.
- Band rather than broadcast herbicides, insecticides, and fertilizers whenever it is possible. Some experts believe that banding will reduce

chemical use by two-thirds.

- Wear rubber gloves and boots when working with chemicals. Don't wear leather as it absorbs chemicals. Disposable, inexpensive coveralls also are available.
- Pump tail-water pits frequently and reuse the water to irrigate so chemical residue won't leach into groundwater.
- Test your well annually.
- Test the soil to see how much of last year's fertilizer remains within reach of the crop before fertilizing again. When figuring fertilizer rates, include nitrogen produced by legumes. Split nitrogen applications by plant growth stages.
- Use one of the five conservation tillage practices: ridge, strip, mulch, reduced, and no tillage.

By **NANCY DORMAN-HICKSON**
with illustrations by **RAY WATKINS**

Consider Pollution Insurance

"If a federal agent drives up in a big black car and starts digging up your soil and taking samples, then says you're responsible for down-creek pollution, what are you going to do?"

That scenario is offered by Jim Beall, the regional underwriting manager of the Mississippi Farm Bureau Insurance Co.

"Most farmers carry a comprehensive general liability policy," says Beall.

That policy may include sudden and accidental coverage, such as a dropped and ruptured can of herbicide getting into creek water, says Michael Robson, agency manager of the American Agricultural Insurance Co.

"But for most pollution purposes, the general liability policy is truly not designed to insure pollution liability," he adds.

General policies definitely do not cover long-term pollution damage, Beall says.

"Let's say John Q. Farmer has an underground diesel tank and it leaks downstream," says Beall. "When the fish start going belly-up in his neighbor's stream, the appropriate agencies come in to find out what's happening, where

it's happening, and when it happened. John Q. can be judged negligent, and then he'll have to make restitution."

Farm Bureau offers \$500,000 to \$1 million coverage for Farm Bureau members. Each farm is rated separately. For instance, a cotton farmer with 5,000 acres who carries coverage for half a million dollars would have a premium of around \$347 annually. But a hog farmer with 100 acres who carries coverage for half a million dollars, and who has 10 hog houses with 10 manure pits, would have a premium of about \$820.

Many state Farm Bureaus will present additional coverage, called Clean-Up Coverage, on that farm pollution policy in the near future. "If the fuel tank leaks on your farm and the EPA determines that you have to clean up the soil, this new coverage will provide cleanup," says Robson. The existing pollution policy only covers off-farm pollution.

Nationally, there are only about 750 pollution policyholders.

"Until some farmer gets sued for three-fourths of what he owns, that's probably the way it will be," Beall says.

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