

- Follow all label instructions regarding use on specific plants and insects and pesticide application rates, methods, and timing.
- Calibrate, clean, and maintain all application equipment properly.

Special steps for farmers and ranchers

- Maintain irrigation equipment and monitor output to minimize the potential for runoff or deep percolation (leaching) losses.
- Consider using setback areas, vegetative filter strips, contour farming, and other practices as appropriate to reduce runoff losses from irrigation and precipitation.

Protect wellheads

- Prevent back-siphoning; use adequate backflow prevention devices in mixing chemicals and filling tanks. In agricultural production chemigation operations, use backflow protection (chemigation check) valves.
- Properly close abandoned water wells.

Plan to minimize risk

- Identify water wells, surface drainage, and other potential pathways for contamination. Avoid using, storing, or mixing pesticides near these areas.
- Note potential sources of contamination, including chemical storage and mixing areas. Secure these areas to minimize the risk of accidental spills and prevent contact with water.
- Prepare plans to prevent contamination and to respond to emergencies.

Special steps for homeowners and small acreage landowners

- Choose a pesticide based on the labeled uses and the user licensing requirements (restricted-use pesticides require a user to have an appropriate pesticide applicator's license).

- Contact your Extension agriculture, natural resources, or integrated pest management agent regarding pesticide application and licensing requirements.

For more information

Please visit the Texas Groundwater Protection Committee Web site: <http://www.tgpc.state.tx.us/>.

For fact sheets and links to other helpful resources on protecting water quality, please visit the Irrigation, Water Quality and Water Management Web site of the Texas AgriLife Research and Extension Center at Lubbock: <http://lubbock.tamu.edu/irrigate/waterqual.php>.

Please visit the Texas Water Development Board's Agricultural Water Conservation Web page to view the Water Conservation Best Management Practices Guide and other agricultural water conservation literature at <http://www.twdb.state.tx.US/assistance/conservation/aglit.asp>.

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Keep Pesticides Out of Texas Water Supplies

Best Management Practices to Prevent Pesticide Contamination

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Demands are increasing for Texas' limited water supplies, so it is critical that we protect them from contamination.

Pesticides offer many benefits and are important tools in ensuring a dependable and pest-free food supply and fiber for clothing. They help us control insects and rodents in our homes and at work. They also help us to control weeds, diseases, and insect pests in our lawns, landscapes, sports fields, and, most importantly, in our agricultural crops, fields, and grazing lands.

However, we need to use pesticides carefully to minimize the risk of harming the environment and our health. Pesticides have been detected in some of Texas' drinking water supplies, largely well below the U.S. Environmental Protection Agency's (EPA's) Maximum Contaminant Level (MCL). Specific Best Management Practices (BMPs) regarding pesticide use and drinking water treatment were implemented to reduce pesticide levels in the water. Prevention is superior to cleaning up pesticide-contaminated

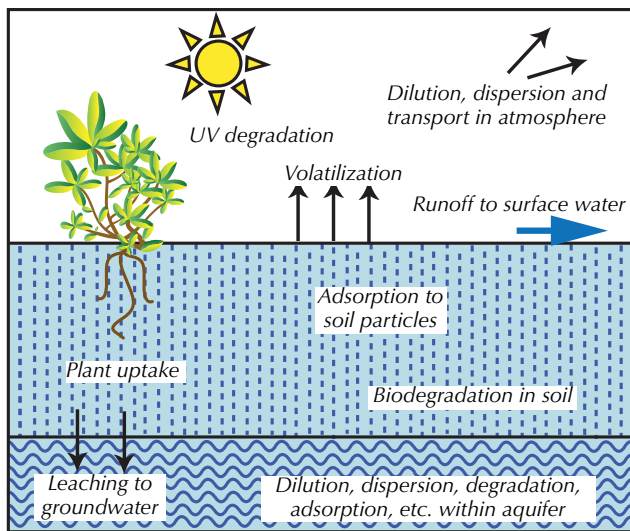


Figure. 1 Some of the ways pesticides may disperse and break down in the environment.

groundwater. Reading and following the directions on the pesticide label is vital for protecting our water resources. By following the pesticide label directions and the suggestions in this brochure, you can be part of the prevention efforts to ensure cleaner water for your children and for all Texans.

Where do pesticides go?

After pesticides are applied, they may evaporate (*volatilize*) into the air, dissolve in water, adhere to soil particles (through *adsorption*), be taken up in or attached to plants, or be broken down by sunlight (through *UV degradation*) or by microorganisms (through *biodegradation*) (Fig. 1).

Pesticides may be transported to groundwater through leaching or to surface water through runoff, erosion, and sedimentation.

Four properties of pesticides can affect the risk of water contamination:

- **Solubility** determines how readily a chemical dissolves in water.
- **Adsorptivity** determines how strongly a chemical is absorbed to soil particles.
- **Volatility** determines how quickly a chemical will evaporate in air.

- **Degradation** describes how quickly a chemical breaks down because of biological and environmental factors.

The information and instructions on a pesticide label take these properties into account when describing the proper use of the pesticide.

Local conditions that affect risk of contamination

Several factors influence the movement of pesticides in the environment:

- **Soil texture** affects how quickly water moves through soil; how much water can be stored in the soil; and, how much surface area is available on the soil particles for adsorption. Water moves quickly through coarse (sandy) soils posing a higher risk for groundwater contamination than finer textured (loam and clay) soils.
- **Organic matter** in the soil reduces the risk of water pollution because it increases the potential for adsorption. It also supports higher populations of microorganisms that can break down the pesticides.
- **Topography, soil structure, soil surface condition, and soil moisture** affect water movement into and through the soil, which influences the risks of contaminants leaching to groundwater or contaminated water running off into surface water.
- The **distance** from groundwater and surface water resources, the **depth** to groundwater, and the **nearness** of abandoned or poorly built water wells also affect risk of contamination.

If you live in an area where the local conditions encourage fast movement of water to groundwater or surface water resources, you need to be even more careful to prevent pesticides from moving from your property into water supplies.

How can I help protect our water from pesticides?

Use integrated pest management strategies

- Choose the right chemical for the problem.
- Apply it at the right time for efficient and effective control.
- Consider crop rotations, conservation tillage practices, optimum planting and harvest dates, and other strategies to achieve good crop results while minimizing the need for pesticides.
- Check with your Extension agriculture, natural resources, or integrated pest management agent for specific integrated pest management recommendations.

Store, handle, and dispose of pesticides properly

- Always read and follow the directions on the pesticide label!
- Store, handle, mix, apply, and dispose of chemicals according to the instructions on the product label, and keep the pesticides away from water wells or water drainage areas.
- To minimize the need for disposal, buy and mix only the amount of chemical that is needed.
- Contain and clean spills quickly.
- Avoid spraying, mixing, and rinsing tanks within 50 feet of a wellhead; use a longer hose or use a water spigot away from the wellhead, if possible.
- Consider installing a concrete pad, detention storage or berms to contain chemicals, spills, and rinse liquids in your mixing and tank-filling area.

Apply pesticides carefully

- Read and follow the label directions!
- Observe all restrictions on location, soil types, depths to water table, and other limitations as noted on the label.