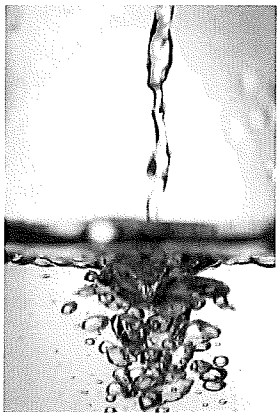
The Source



A Comprehensive Source of Information for Source Water Protection Programs

October 2021

Pesticides and herbicides work by interfering with the life processes of plants and insects. As you are probably already aware, some pesticides and herbicides are toxic to humans, livestock, and our pets. Even though pesticides/herbicides are normally not found in high enough concentrations in our drinking water to cause acute health effects immediately, the concern is more for the chronic health problems that may result from prolonged exposure to trace amounts. Therefore, I feel that a discussion on the proper handling and storage of these chemicals is of importance at this time.

Regards,
Deborah McMullan
Source Water Protection Specialist

STORAGE AND HANDLING OF PESTICIDES/HERBICIDES

Even though pesticides and herbicides play an important part in agriculture, we must take voluntary actions to ensure that these chemicals are not introduced to our drinking water. Acute health effects from pesticide and herbicide exposure includes chemical burns, nausea and convulsions. This article will cover proper way to store, mix and load pesticides. As well as spill cleanup and container disposal.

STORAGE OF PESTICIDES

If a bulk liquid pesticide or herbicide is stored in an above ground tank, there should be an impermeable concrete floor underneath the tank. This floor should also have a curb around the entire floor to prevent chemicals from spreading to other areas. The containment area should be large enough to confine 125% of the contents of the tank.

- Always store pesticides and herbicides inside a building. This building should be located at a minimum of 100 feet away from any water well or surface water. This distance should be greater if the site has very sandy soils or fractured bedrock near the surface. The risk of pesticides contaminating ground water is directly influenced by the properties of the pesticide and the soil on which it may be spilled and applied.
- Locate the mixing and loading area close to your storage facility and provide a concrete floor for the mixing area. This will make clean up of spills much easier.
- Keep large drums or bags on pallets rather than the floor. Shelves for smaller containers should have lips to keep the containers from sliding off. Steel shelves

are more appropriate for this use than wood shelves. This makes clean up of spills much easier.
- Store dry products above liquid to prevent wetting from spills.
- Keep pesticides separate from herbicides, insecticides, and fungicides.

MIXING AND LOADING

For agricultural purposes, an impermeable or waterproof surface should be provided for mixing and loading of pesticides and herbicides. The pad should be large enough to contain leaks from bulk tanks, to hold wash water from cleaning equipment and to keep spills from transferring chemicals to the sprayer or spreader.

Always keep the pad clean and dispose of pesticides properly so that rainfall will not mix with spilled pesticides/herbicides and cause contamination.

Locate the pad next to the storage area, making sure that any water runoff from the pad flows away from water wells. If necessary to prevent runoff water from reaching a well, you may need to construct a diversion to another area.

Spills and leaks will occur from time to time. Even when there is no impermeable mixing and loading pad, the risk of contamination can be minimized by following a few basic guidelines.

- Avoid mixing and loading pesticides/herbicides near any well. This may require the use of a nurse tank to transport water to the mixing site. Preferably the mixing site should be within the field of application.
- Avoid mixing and loading on gravel driveways or other surfaces that allow spills to sink quickly through the soil. Remember a clay surface is better than sand.
- Install a back-siphon prevention device on the well or hydrants to prevent reverse flow of liquids into the water supply.
- Leave a 6-inch air gap between the hose and the top of the sprayer tank. Never put the hose inside the sprayer tank.

SPILL CLEANUP

Promptly sweep up dry spills and reuse the pesticides and herbicides as intended. You may have to remove some debris such as sticks, rocks etc.

Liquid spills are harder to clean up. You should first recover as much of the spill as possible and reuse is as it was intended. Again, it may be necessary to remove some debris such as sticks, rocks, clay pods etc. If the spill has reached the soil, you may need to remove this soil to the field in which the pesticide was intended to be used. Also, have clay, sawdust, or cat litter available to absorb unrecovered liquid from concrete pads.

CONTAINER DISPOSAL

Leaving containers unwashed and improperly stored can lead to ground water contamination if chemical residues leak onto the ground. To prevent this from occurring follow these guidelines:

- Use returnable containers and mini bulks. Be sure to take them back to the dealer as often as possible.
- Pressure-rinse or triple-rinse containers immediately after use. Some reside can become difficult to remove after it dries. Pour the rinse water into the spray tank. Puncture containers and store them in a covered area until you take them to a permitted landfill.
- Recycle plastic and metal containers whenever possible.
- Shake out bags, bind or wrap them to minimize dust, and take them to a permitted landfill.
- Do not bury or burn pesticide containers or bags on private property.

WHAT CAN A WATER SYSTEM DO TO HELP PREVENT CONTAMINATION?

- Notify local farmers, ranchers, and agricultural product applicators that your Source Water Protection Program exists and educate them as to the location of your Capture Zone so that care can be taken when using these products.
- Provide educational materials on proper applications of pesticides and herbicides to reduce leaching or other adverse environmental effects.
- If the System's wells are located within an agricultural area, monitoring of the public wells periodically for any sign of contamination from infiltration of agricultural products or runoff.
- Host an annual agricultural chemical collection program.
- Encourage farmers to contact the Texas Soil and Water Conservation Board's Conservation Reserve Program on possible best management practices they may implement.

ATRAZINE A COMMON CHEMICAL FOUND IN PESTICIDES AND HERBICIDES

Atrazine is the most widely used herbicide in Texas production. It is also found as an active ingredient in "weed-and-feed" products. With its widespread use, atrazine has been discovered in minute quantities in Texas ground and surface waters. Because of this, it is important to understand atrazine behavior in the environment and the adverse effect on human and animal health.

Atrazine kills plants by disrupting photosynthesis. Photosynthesis happens when light energy is converted to chemical energy needed for food production. Atrazine simply causes a targeted plant to starve to death.

Atrazine is generally applied to soil in a broadcast manner to ensure adequate distribution over the desired area. Rainfall and irrigation shortly after application transports atrazine into the upper soil where plant seedlings germinate. These seedlings take up the herbicide

through the roots. If rainfall or irrigation water accumulates at the soil surface faster than it can percolate into the upper soil, this standing water may run off the application site and carry some of the atrazine with it.

Since atrazine is moderately water soluble, it will be present in the surface runoff water as well as in the soil water percolating downward. Atrazine is needed in the upper soil for weed control. Its movement downward through the soil, or leaching, is limited by its ability to attach itself to soil particles. Soils high in clay and organic matter content are less likely to let atrazine move downward than sandy soils. Atrazine will generally stay in the upper 1 to 6 inches of the soil.

Therefore, the presence of atrazine in surface water runoff is of greatest concern. It may kill untargeted aquatic plant life when entering waterways. It may also be carried into streams and other tributaries that flow into surface water that may be used as a source for dinking water. Atrazine has been detected at very low levels in surface waters at several locations throughout Texas. Normal water purification systems used by municipalities do not remove atrazine from the water.

Should the public be alarmed? The Environmental Protection Agency (EPA) has established a maximum contaminant level (MCL) for atrazine. Drinking water that meets this standard is considered safe with respect to atrazine. The calculated MCL for atrazine in drinking water is three parts per billion. The EPA believes that water containing atrazine at or below this level is acceptable for drinking every day over the course of one's life. In fact, in order to obtain an acute dose of atrazine from water contaminated at the maximum level, a person would have to drink more than 9 million gallons of water at one time. In this case, the water would be a greater problem than the atrazine, because drinking more than 15 percent of one's body weight is lethal.

One of the main problems with atrazine run off is the killing of untargeted plant life that could lead to unwanted environmental changes in our rivers and streams. Care should be taken to use properly calibrated application devices. Proper container cleanup and disposal also are essential protection practices.

If you have added a water source since your original Source Water Protection Plan was created, then it's time for an update. Call Deborah McMullan 512-923-5842 or Deborah.mcmullan@trwa.org for free assistance.

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