

## Herbicides and Water Quality

### **Use caution when working with all pesticides!**

The term “pesticide” includes herbicides, fungicides, insecticides, and anything else that kills or controls what might be considered pests in the garden. Almost all pesticides we use on our landscapes or in our gardens have potentially damaging side effects. This is especially true if they are not used exactly as their labels state. Over-application not only may damage desirable plants, but careless use can be very harmful to beneficial organisms such as birds and bees.

Ground and surface water pollution are also possible problems when chemicals are used in the garden. Water quality is an issue that is now a matter of national concern. All of us who tend plants in western Washington can play a part in helping to keep our natural waters clean and healthy.

Herbicides, which are commonly used to control unwanted plants in yards and gardens and often applied directly to the soil, have the highest potential for causing ground and surface water pollution. All of us live on a stream, whether there is one flowing through our backyard or not. Water that flows off our land finds its way into drainage ditches or storm sewers and eventually into larger bodies of water. It carries with it in solution or suspension much of what it contacts, and pollution is often the result.

Whether an herbicide has the potential to find its way into ground or surface water is dependent on a number of factors. A chemical’s solubility (whether it readily dissolves in water), its adsorptive qualities (how tightly it binds to clay and humus particles in the soil), and its degradation (how fast it breaks down into harmless components) are all factors that influence a chemical’s movement in the soil.

External factors that must also be considered include soil texture, slope or grade of the land, depth of groundwater from soil surface, and hardpans or other impermeable subsoil layers.

Texture refers to the amounts of sand, silt, and clay that make up a soil. Soils that contain a fair amount of clay are less likely to allow rapid movement of herbicides through them. The clay particles bind herbicide molecules tightly to themselves, and, for the most part, herbicides do not leach into groundwater. A soil containing humus will act in much the same way, binding up the chemicals. However, erosion or runoff may carry the particles of clay along with their tightly adsorbed herbicides, and they will eventually get into surface water. Sandy soil does not adsorb chemicals, and an herbicide that is very soluble in water may pass through it and wind up in the groundwater relatively quickly. Lots of organic matter or humus added to a sandy soil will cause it to act more like a clay one.

Many chemicals are attacked and broken down by microbes in the soil. In addition, some herbicides are broken down fairly rapidly by light through a process called photodecomposition. The residual activity of an herbicide is directly related to how quickly it's broken down into harmless components. Obviously, chemicals that remain in their original condition for long periods have a greater chance of getting into water just by virtue of the fact that they are around for such a long time. However, if these materials are tightly bound to clays and humus, they are unlikely to be a problem for groundwater no matter how long they are active in the soil.

Here are some steps you can take to help prevent herbicide contamination of our water:

1. Whenever possible, pull weeds by hand.
2. Generous use of mulch will greatly inhibit the growth of weeds.
3. Use proper irrigation techniques. Direct water where it is needed, and don't allow it to run off onto sidewalks or down driveways, thereby carrying herbicides directly to storm drains. Don't overwater, which can also cause runoff.
4. Amend sandy soil to increase its adsorption capability and decrease leaching of chemicals into groundwater.
5. Correct soil erosion. This can be done by planting , so that roots hold the water, by modifying a slope, and by changing the texture of the soil to increase its ability to hold water. Installing a drainage system or a barrier might also help.
6. **As is true with all pesticides, the best practice is to minimize usage.**