



## What to Consider Before Using Soil Sterilant or “Bare-ground” Herbicides

**JoAnne Skelly, Extension Educator Carson City / Storey County**  
**Susan Donaldson, Water Quality Education Specialist**

Imagine never having to weed again. It’s every gardener, landowner or property manager’s dream. When people read on an herbicide label that soil sterilants kill all unwanted plants, they think they have found the answer to their weed problems. It is important to understand how these products work and what problems can result from their use.

Soil sterilant herbicides are “total kill” products that last in the soil for long periods, sometimes for 10 or more years, particularly in arid environments. They have the potential to unintentionally cause significant damage to desirable plants. They are sometimes called bare-ground herbicides, as they are used to remove all vegetation from the area of application, and they persist in their active form for long periods. Unlike preemergence herbicides, which only affect sprouting seeds, soil sterilants are designed to kill existing vegetation.

While these products may kill the weeds you don’t want, they may also kill your favorite shade tree if its roots are currently



*Tree roots can extend long distances from trees, and soil sterilants can adversely affect trees at some distance from the area of application.*

growing in the area where you have applied the herbicide, or they may grow into those areas while the product is still active.

Soil sterilants are meant for use in non-vegetated areas, such as railroad rights-of-way, industrial sites, parking lots and roadways, or where undesirable plants could cause damage, present fire hazards or impede work crews (Ware and Whitacre,

2004). They are not designed for home use around gardens and landscapes.

### **Properties of soil sterilants**

There are many different types of herbicides, and they affect plants in different ways. A selective herbicide kills specific types of plants, such as grasses or broadleaf weeds such as dandelions. Non-selective types kill most plants with which they come into contact. This includes grass and broadleaf weeds as well as desirable plants. Pre-emergence weed killers prevent sprouted weed seeds from growing, but don't kill established weeds. Post-emergence herbicides are effective in controlling existing weeds. Soil sterilant herbicides are non-selective pre- and post-emergence vegetation killers.

In addition to their long lifetimes, most soil sterilants are also very water-soluble. They can move downward or laterally with rain or irrigation water through soil to the roots of desirable trees, shrubs and other plants, especially when applied on an incline or slope. Since roots of trees may extend horizontally three to four times the width of the tree or plant canopy, it may not be obvious where they are growing. The result can be death or serious injury to desirable plants even though they are located a distance from the original application site. There are many stories of chemical applications killing neighbors' trees, shrubs and lawn. Even rinsing a sprayer or washing off equipment near desirable plants can damage or kill those plants.

Because these chemicals remain in the soil for so many years, they can continue to spread with water movement, year after year. Runoff containing soil sterilants can contaminate surface water supplies. When a soil sterilant moves through the soil, there

is also the possibility for groundwater contamination. Label directions usually prohibit using these products near drinking water reservoirs or where wells may be recharged.

Soil sterilants containing the active ingredients atrazine, bromacil, diuron, prometon, simazine and tebuthiuron have all been found in low levels as water contaminants in various locations in Nevada. The amount of leaching that may occur depends on the soil type and amount of rain or irrigation. The potential for movement is usually greatest in sandy soils (EXTOXNET, 1993)

Problems can also result if treated soil is moved or blows from the application site to another part of the yard, where it can damage plants or prevent plant growth in the new location. Similarly, compost can be contaminated when treated foliage is added to the raw materials.

Long-term use of soil sterilants will cause bare ground that is prone to erosion, may eliminate healthy insect diversity and can increase the incidence of wildlife pests such as ground squirrels. The plants that are able to grow in these sites are often noxious weeds (Wolfe, 1999). Weeds also may develop a resistance to the product, becoming more difficult to control.

### **Sample label language**

Before you use any pesticide, you must read and understand the label directions. Labels include information about sites in which products can be used, special warnings or restrictions relating to environmental hazards, and the types of plants that can be controlled by the product.

Directions on one soil sterilant label state:  
*To be used on ramps, fence rows, railroad*

*sidings, in storage yards, parking lots, around buildings, industrial plant sites, lumberyards, utility and pipelines, schools highway authorities, vacant lots.*

*This granular weed killer is a non-selective herbicide for controlling a wide range of annual and perennial weeds and grasses. It is recommended only for non-cropland areas such as railroads rights-of-way and industrial areas (underscore added by authors)...Do not apply on or near valuable woody or herbaceous plants or on areas where their roots may extend because of possible injury to such plants...Do not use on any land to be used for subsequent cropping. Keep animals off treated areas (Bing, 2010).*

It is a violation of law to apply a product in an area that is not specified on the label. Note that the label does not allow use in residential landscapes.

It is your responsibility as the product user to take appropriate measures to ensure the product does not damage adjacent plants, leach into water bodies or contaminate non-target sites.

## **Conclusion**

The old saying “If it sounds too good to be true, it probably is” applies to soil sterilant or bare-ground herbicides. It takes a long time to regrow a mature tree that has been damaged by herbicides, and offsite damage to neighbors’ plants can be costly to rectify. It is extremely difficult and expensive to clean up contaminated drinking water, rivers, streams or lakes. The risks of using soil sterilants far outweigh the benefits to homeowners.

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