

Why Do Septic Systems Fail?

John Talbott

Does sewage back up into your house?

Is there a wet, smelly spot in your yard that is difficult to mow?

Is your septic tank piped to a road ditch, storm sewer or stream, or connected to farm drain tile?

If you answered yes to any of these questions, your septic system is designed improperly or failing. It is not treating and disposing of sewage in a safe, sanitary manner.

In a properly operating septic system, the solid material in the sewage is settled out in a septic tank and stored until removal by pumping.

The effluent from the tank is still sewage. It has a strong odor and is high in disease-causing organisms. This effluent is treated and absorbed in a soil absorption or leach field.

No matter what the cause, septic system failure is a nuisance and a health hazard that should be corrected promptly. Failures can result in the spread of serious disease and pollution of wells, lakes and streams. Some of the more common reasons for septic system failure are discussed here. These failures can be attributed to several causes. A trained sanitarian should diagnose the problem and make recommendations for corrective action.



Replacing a septic system is a big task involving soil moving and heavy equipment.

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Using too much water

Using more water than the soil can absorb is the most common reason for failure. The sewage is forced to the surface or backs up into the house. This problem often is the result of one of two things:

- Improper design of the system.
- A change in water use habits, such as an increase in the size of the family or the addition of a water-using appliance.

Surface water draining from roofs, driveways and roads onto the soil absorption field area can put an extra load on the system. If the soil is saturated with clean water, even seasonally, it cannot accept any more wastewater. The untreated wastewater either will rise to the surface or back up.

Physical damage

Driving, parking or building on top of a soil absorption unit can damage the field. Pipes can shift or be crushed, and the soil can become compacted. Damage of this sort can make it difficult to locate the septic tank and prevents access for regular pumping.

Tree roots also can clog the soil absorption field. Plant the area in grass, not trees or shrubs.

Improper design and construction

Improperly designed or constructed septic systems are doomed from the start. These systems usually fail in a few months because they are sized inadequately, installed in impermeable soils or not constructed properly. In Oregon, several inches of unsaturated soil must be present beneath the soil absorption system to a limiting layer. Temporary or permanent water tables, bedrock or impervious soil all are considered limiting layers.

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The soil is the most important part of the septic system and must be evaluated and protected properly. If the soil layer is too thin, the wastewater will not be treated before it enters the groundwater.

If the soil is too compacted, it will not absorb all the wastewater, forcing it to the surface. The soil profile should be evaluated by a local health department sanitarian or a registered soil scientist to ensure that it's appropriate for wastewater treatment and disposal. Even compacted soils will prove adequate if the ditch for the absorption line is deep enough and wide enough to accommodate placement of gravel. Gravel increases the absorption capacity of the system.

When constructing a septic system, it's essential that all components of the soil absorption field be designed with 1/8 to 1/4 inch of fall for each foot of length of the absorption line. If a line lies at too steep a grade, the wastewater will not be evenly distributed to all portions of the soil absorption field. This may overload one part of the field.

The heavy equipment used in home construction can compact the soil. During construction of the house, fence off certain areas to keep out heavy vehicles: the area designated for the soil absorption system, the required replacement area and the area directly downhill. Note that constructing and excavating a system during periods of high soil moisture can result in excessive soil smearing and compaction.

Lack of maintenance

The septic tank should be pumped about every three years to remove the sludge and scum retained in the tank and prevent clogging of the soil absorption field. Pump more frequently if a garbage disposal is used in the home. You can prevent problems with garbage disposals by excluding materials not readily digestible by the tank's bacteria. These materials include eggshells, fruit pits and bones. Use toilet paper that is designated as safe for septic systems. Biological and chemical septic tank additives are unnecessary and do not eliminate the need for pumping.

A septic tank is equipped with baffles at both the inlet and outlet. The inlet baffle prevents short-circuiting of the sewage, and the outlet baffle prevents the floatable scum from moving out into the soil absorption field. In time, these baffles can deteriorate and drop off into the tank. The condition of the baffles should be checked when the tank is being pumped. Replace those in poor condition with sanitary tees.

Corrective action

Any repair or new installation of a septic system must be approved by the local sanitarian, and the local health department is responsible for issuing a permit.

Water conservation reduces the amount of water the absorption field must accept. It also reduces the flow through the septic tank, allowing more time for solids to settle out. Water conservation can prolong the life of any soil absorption system.

Install additional lines of soil absorption field to increase the size and capacity of the soil absorption system to accept wastewater. Or, you can plug one line, diverting all of the wastewater into the remaining lines for at least one year. The next year a different line can be plugged, and the rested line reopened. In this way, you can rest one line each year, thus regaining capacity to accept and treat wastewater in the soil.

Repair physical damage such as leveling the distribution box or repairing crushed or broken pipe to restore the system. Remove any tree roots interfering with the operation of the soil absorption field.

Improve surface and subsurface drainage by diverting all surface and groundwater away from the soil absorption field. The soil must absorb all the wastewater from the house. Surface and groundwater only add to the load.

When a system fails

- Do not place more soil over a surfacing soil absorption field; this does not fix the system, and it will soon surface again.
- Do not pipe the sewage to the road ditch, storm sewer, stream or a farm drain tile. Doing this pollutes the water and creates a health hazard.
- Do not run the sewage into a sinkhole or drainage well. This pollutes the groundwater.
- Do not wait for the system to fail before pumping the septic tank. Once a system fails, it's usually too late to pump the tank. In some cases, corrective measures are not enough — a new system must be constructed.

A properly designed, constructed and maintained septic system can treat wastewater effectively for many years. For more information, contact your county office of the OSU Extension Service or your local health department.



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