



Onsite Wastewater Treatment System Additives

Facilities that are not connected to central sewers require an onsite wastewater treatment system. Proper wastewater system function, trouble-free operation, and low lifetime costs depend on regular maintenance and system care. Owners and users of septic systems should refer to the "taking care of your system" section in the K-State Research and Extension publication *Getting to Know Your Septic System*, MF-2179 publication for more extensive guidance about care.

With the exception of lagoons, most onsite wastewater treatment systems consist of a septic tank and some type of soil treatment area. The soil treatment area typically contains gravity laterals, either rock and pipes, or chambers. The area could also be pressure-dosed using low pressure pipe, a mound, or a drip field. Whatever soil treatment is used, routine maintenance is essential for high function and long life of the treatment system.

Septic system additives are often highly promoted as an alternative to regular system maintenance and pumping. This publication addresses the questions: What are the actual benefits to using additives? What are the potential problems? Do additives have an effect on the function of the systems or the components of a septic system? Are they really needed? Considering the cost, do system additives provide an economic value? The following information concerning the use of onsite wastewater treatment system additives is true for all soil-based treatment systems.

Types of Additives

Generally, septic system additives are intended to perform either a chemical or biological function. Biological additives are usually bacteria, enzymes, yeast, or combinations of these materials. Chemical additives can either be inorganic (acids or bases) or organic, often including solvents.

Advertised Benefits of Additives

A wide variety of nationally and regionally marketed products are advertised as septic tank or onsite wastewater treatment system additives. Benefits claimed by these products include:

- Rehabilitating a failing (clogged) soil absorption system
- Rejuvenating stressed bacterial populations
- Maintaining system health
- Preventing system failure
- Improving settling of solids in the septic tank
- Digesting organic solids in the tank.

Additive Testing

Limited third-party research studies have been performed to evaluate septic system additives. Because they are conducted apart from the manufacturer (and companies they directly hire), these are the only tests considered unbiased. These few studies found no benefit to the septic tank function using any type of septic system additives, either chemical or biological. Most research indicates that additives have no effect on wastewater systems. In fact, some additives potentially could be detrimental to the function or components of the septic system or to groundwater quality.

Potential Detriments

Several potentially detrimental effects can result from using either a biological or a chemical additive. To better understand the possible negative effects, the functions of the system components must be understood.

As mentioned previously, the onsite wastewater treatment system is composed of a septic tank and dispersal field. In the septic tank, three layers develop. The bottom layer is the solids (sludge), which settle out in the tank. The middle layer is the partially clarified water, or effluent. The upper layer is comprised of floating scum, including fats, oils, and greases. These materials are lighter than water and float to the surface. Only the effluent from the middle layer should enter the soil

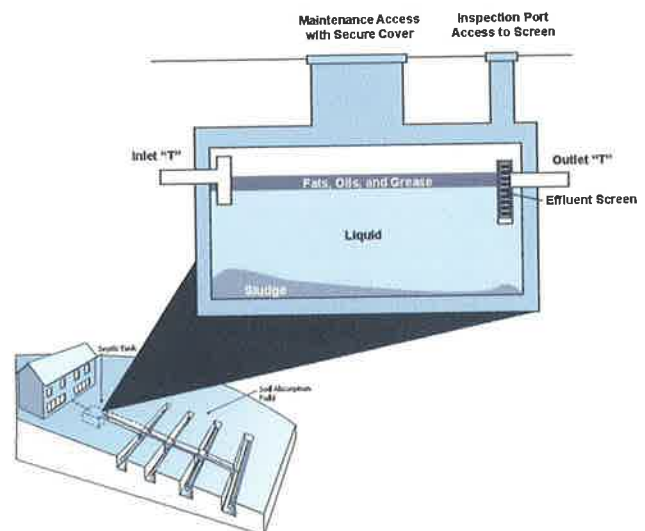


Figure 1. An important component of most onsite wastewater treatment systems is the septic tank. Notice that waste separates into three distinct layers in a properly functioning septic tank.

absorption field because solids and scum eventually plug the soil pores and lead to slower rates of absorption and potential system failure. Consequently, products that may interfere with component function should not be added to the septic system.

Biological Additives

Microbes are an important part of the treatment system because they degrade organic materials and reduce the amount of solids in the tank. Therefore, many biological additives are marketed for the purpose of accelerating this process. One research study, however, found that the use of a biological additive causes excessive decomposition of solids, which leads to overabundant gas production in the sludge layer. As a result, solids can become resuspended in the tank and transported into the soil absorption system, causing deposits in the pipelines, clogged soil pores, and reduced soil absorption rates. Therefore, avoid additives that cause the septic tank layers to mix.

Research has shown biological additives make no significant difference in the microbe population or diversity in a septic tank. Additives are not necessary for "restarting" microbe populations after the tank is pumped, or after the use of harsh chemical products in the home (such as drain cleaners, heavy duty cleaning products, or disinfectants). In a matter of a few days, microbe populations will become naturally re-established after the use of these products.

Chemical Additives

The hazards of chemical additives are potentially more serious than biological additives. Hydrogen peroxide was once thought to have the ability to rehabilitate soil absorption systems by removing organic material that was clogging the soil. However, subsequent studies found that hydrogen peroxide actually destroys soil structure and, thus, shortens the life span of soil absorption fields.

In addition to being dangerous to handle, some chemical additives may contain chemicals that are corrosive to metal and damaging to concrete. Some chemical additives may temporarily kill or sterilize the microbial population of the septic tank, allowing untreated effluent to pass through the tank and into the soil absorption system. Although tree roots cause damage to soil absorption systems and sewer lines,

chemicals designed to control tree roots should never be added to the system. Because solvent chemicals are not degraded as they pass through the soil, a solvent-containing additive passes through the septic system and contaminates groundwater.

Economics of Additives

Rather than routinely spending money on additives, a wiser decision would be to have the septic tank pumped by a professional every 3 to 5 years. Comparing the cost of additive manufacturers' recommended use, regular pumping of the tank is cheaper than septic system additives.

Conclusions and Recommendations

Research indicates that additives are not a suitable alternative to proper septic tank maintenance. To remove solids and protect the soil dispersal field, pump septic tanks every 3 to 5 years, depending on tank size, household occupants, and material disposal intensity.

A properly functioning and well-maintained septic system does not need septic tank additives at any time. In spite of claims and testimonials, research has not proven that additives improve a poorly functioning system. In fact, caution should be taken in using these products to avoid damage to the components or interference with the system function. Regular, planned maintenance will prolong the life and enhance the function of soil-based onsite wastewater treatment systems.

Additional Reading

United States Environmental Protection Agency. 2002. *Septic Tank Additives*, Special Fact Sheet 1. Onsite Wastewater Treatment Systems Manual. www.epa.gov/nrmrl/pubs/625r00008/html/fs1.htm

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CIDWT Decentralized Wastewater Glossary. Available online at: www.onsiteconsortium.org/files/GlossaryFinal_12-19-07.pdf.

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Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2877

February 2009

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