FACT SHEET

Septic System Alternatives

In many areas where remote cabins are located, or rural water and sewer systems do not exist in rural communities, the pit privy is still utilized. Extension has plans for a functional, sound design for pit privies. In addition to plans, a new list of publications and ideas for alternative septic systems is available from the National Small Flows Clearinghouse, and a copy is now in each office of Cooperative Extension Service. Some of the more relevant publications are listed below with their price and order number from the National Small Flows Clearinghouse. The mailing address for the National Small Flows Clearinghouse is:
National Small Flows Clearinghouse,
West Virginia University,
P.O. Box 6064,
Morgantown, West Virginia 26506-6064.

To fax your order, the fax number is: 1-304-293-3161.

You can call in an order to: 1-800-624-8301 and ask for a National Small Flows Clearinghouse customer service representative, but note that business hours are: 8 am. to 5 p.m.. eastern standard time.

The Clearinghouse also offers a publication on Alternative Toilets for $12.95, publication number WWBKG-N09. There are two publications on innovative, alternative technologies, WWBRG-N05, Innovative/Alternative Technologies I for $1.90 and WWBRG-N-07, Innovative/Alternative Technologies II for $2.30. There's also a publication on Onsite Sand Filter Packages, WWPCG-N29 for $14.10. A further list, as indicated earlier, of products and information resources is available from your Extension office.

FACT SHEET

Enzyme and Septic System Additives: are they worth it?

Another aspect of onsite septic systems that is important to understand, is whether Enzyme Treatments and Septic System Additives are necessary and worth the trouble and expense. Many companies advertise an enzyme additive which can be added to your septic system, and is intended to enhance the biological degradation and decrease the amount of solids in a septic tank. While there is nothing detrimental in these additives, the only thing in truth that will actually increase the biological decomposition of septic wastes, is to increase the temperature of the septic tank. Some of these additives cost from $100 to $200 but will do very little to improve the performance and decomposition rate in septic systems. They are definitely not advisable, especially for the price. The most important thing to understand about additives, is that not much you can add to your system will improve its performance except to raise the temperature. Everything that is important to the degradation of septic wastes is already in your septic tank. Therefore nothing need be added for it to work well. Methods for simply raising the temperature of a septic system is described in Fact sheet 3, "Insulating a Septic System: What's Best?".

The office of the Cooperative Extension Service Housing and Energy Specialist maintains a file copy of a publication from the National Small Flows Clearinghouse entitled, "Additives Information Package, WWPCGN66" which supports the contentions of this factsheet. Call 1(800) 478-8324 for further information.

FACT SHEET

Insulating A Septic System: What's Best?

Other important questions regarding septic tanks are: How important is insulating the septic system, and should you insulate the leach field? First insulating a septic system can in no way hurt anything and will probably improve its performance. Insulating will increase the temperature in a septic tank, but this does not mean it won't have to be pumped out regularly. However, insulating the septic system effectively raises the temperature of the tank and therefore will increase biological activity in the tank. It also ensures against a

snowless, very cold winter where freeze depth may severely curtail biological activity and lower the temperature in the septic tank, perhaps even freezing the septic tank contents.

A similar recommendation is true for the leach field. Keeping the leach field warmer and preventing it from freezing during the winter will help sustain leaching conditions in the soil and therefore will improve the winter performance of the system. However, it is more important to keep the tank warm than it is to keep the leach field warm. A better solution, rather than spending money to insulate the leach field from above, would be to simply bury it deeper in the ground, if that is possible, within the constraints of the water table level at your site.

Extension agents are often asked: how regularly should a septic system should be pumped in order to keep it functional? This is a difficult question to answer for all cases because systems are site specific and the amount of use is crucial. Generally it is suggested that every two years a septic system be pumped out. The reason for this is that most septic tanks are nothing more than long term storage tanks. They cannot achieve significant biological degradation of the septic wastes in the soil at the temperatures we typically have in the ground in Alaska. So they must be pumped and the sewage taken to either a sewage treatment plant or a safe disposal area for final disposal.

However if your house has a large number of people living in it, more than the bedroom design would normally accommodate, (more than two people per bedroom) then it's likely that your septic tank load will be higher than normal and pumping it every year might be in order. Another crucial factor is the amount of absorption your septic system can handle in terms of soil leaching. You may have "tight" soils or loess which has a very low "hydraulic conductivity", and can't accept much water. The soil may have a poor percolation test result because water flows through it very slowly. In such cases, it also may be necessary to pump it more often so that slow leaching does not limit the performance of your septic disposal system.

You may also find that after ten years or so, a leach field begins to fail. This is a common occurrence because a healthy leach field will get a regular flow of bacteria from the fluids exiting the septic tank. These bacteria create organic slimes in the soil which clog the soil pores and cut down enormously on the absorption capacity of the soils. An interesting suggestion has been made recently which could help deal with this problem. Consider installing two parallel leach trenches, two parallel leach systems which could be alternatively used by valving both of them.

The scenario would go like this: one trench of the leach system would be used for a period of two years and then the valve closed. The other is then opened by its valve, so that the second parallel system would then serve as the leach field for the next two years, while the original, having been closed down, would lie fallow and recover from the bacterial loading that it had received. This drying out and "lying fallow", by switching every two years alternatively, from one leach system to another, could and probably should in most cases, enable the leach field(s) to last indefinitely. This is a system that has recently been suggested by engineers and experienced people in the industry and hasn't been tested widely, but seems to make very good sense. And if it's possible to afford such an option, it's highly recommended. Obviously it costs twice as much for the leach field that's twice the size in order that each can handle the leach requirements separately over alternating two year periods.

Finally for composting toilet alternatives and other detailed information regarding onsite waste water treatment and septic tanks and any alternatives you may be interested in considering, please call 1-800-478-8324, the Extension Energy and Housing Specialist, for details, and publications on these topics.

FACT SHEET

The Effect of Salt and Back Flush of Water Softening Systems to Septic Tanks and Leach Fields

Many areas of Alaska suffer from poor water quality. In order to overcome this problem, many Alaskans use sodium chloride-based water softening treatment to improve the quality of their water. These systems require

back flushing and the back flush solution is highly saline, containing sodium chloride, common salt, which is then flushed into a septic system and leach field. It is well known that salt is an antibiotic material. Salt effectively kills bacteria and other pathogens at high concentrations, similar to those that are in the back flushing solution. It also is highly corrosive. So salt will have two effects, both of them negative, on septic systems. It can inhibit or entirely eradicate the bacterial action of the anaerobic bacteria in your septic tank and at the same time, it will corrode and rust away metal septic tanks.

The first action salt has on a septic system is on the performance of a leach field. If the salt solution gets into the leachate, it kills the bacteria in the leach field and eliminates the accumulation of bacterial slimes, and this allows the leach field to work better. However, the leachate then is more polluting because it contains untreated sewage with dead bacteria in it, an effect of the salt in the septic tank. Although the leach field will not fail as quickly, the system as a whole is working poorly and will need to be pumped often in order to function well. This regular addition of salt will have this effect continuously over the life of the septic system.

One way to overcome the problem of corrosion, due to salt back flushed into a septic system, is to use either a fiberglass or polyethylene plastic septic tank. These are becoming more common and easily available and are a good idea for many reasons. Whether or not salt is an issue, polyethylene results in a life time tank, since it will not corrode. Since it is buried, no detrimental effects from ultra violet light, which degrades plastic, will occur. The only disadvantage of plastic tanks is that they have to be filled almost entirely with water when installed in order to keep from collapsing during back fill. This is because they are not as strong as a steel tank, but for every other reason they are a very wise choice. Normally this temporary water fill is drained into the leach field fairly quickly, as the tank fills with other septage.

The winter 1995 issue of Small Flows newsletter, contains a series of letters from researchers (p. 11 of the issue), on the concerns about discharging chloride salts into a septic system. None of the research reports any positive effects whatsoever from sodium chloride. For instance, on Letters to the Editor, page 11, one respondent, Benjamin Boer, advocates use of potassium chloride instead of sodium chloride as a regenerant for water softener systems. Attached to the letter is a brief article on why potassium chloride is a positive solution and a good substitute for sodium chloride. His community, Cambria, California, made a decision to promote potassium chloride instead of sodium chloride as a water softening regenerant. He says that potassium chloride's higher cost (sometimes as much as twice the cost of sodium chloride) is more than outweighed by its benefits for a small community. He says sodium chloride remaining in the treated wastewater may affect the district's waste discharge requirements and its suitability for agricultural use. This problem is not an issue in Alaska.

Another overview by Mary H. Gayman of Drayner, Inc. of Kingsburg, California, gives a phone number for further information (209) 897-3323, and covers a wide range of impacts on septic drainage soils (the leach field) of sodium additions. She maintains right up front that the harmful effect of sodiums on soil, clays particularly, is well documented. Waters containing 50 percent or more as sodium ion of total cations (sodium, calcium, magnesium and potassium) are potentially harmful to water absorption characteristics of soil. Even in sandy soils, waters of 85 percent or higher salt content are likely to make soils impermeable after prolonged use. Interpret this as meaning that a high sodium loading of septic tank effluent is going to (eventually) make your soils totally dysfunctional as absorption media for your leach field.

An important research report was done in 1984 for the Water Quality Research Council. It was entitled "Potential Effect of Water Softener Use on Septic Tank Soil Absorption in On-Site Waste Water Systems". It was done by University of Wisconsin-Madison researchers E.J. Tyler, R.B. Corey, and M.U. Olotu. The report recommends that studies be initiated to determine the effects of solutions containing conductivities of natural soil columns and actual salt concentrations in various zones of septic tanks without and with the addition of water softener wastes. This is because the actual difficulty of measuring the effects of water softeners has never been separately investigated to an adequate extent to prove their damage capability or if in fact they are not harmful.

One interesting point for home owners to be aware of is that labels on commonly used laundry powders and

cleaning, beauty, and cooking products reveal high levels of sodium as principle ingredients. Robert A. Patterson, soil scientist of the Department of Resource Engineering, University of New England, New South Wales, Australia determined that 38 percent of the sodium budget for septic systems comes from laundry powders, which list up to 40 percent of their content as sodium sulfate. So it's important to be aware that even if you don't have a water softener that's sodium chloride based, you are putting a lot of sodium into the septic system anyway. Clearly sodium does not have any beneficial effects and one needs to be aware of the long term potential of continuous sodium addition and amount of increased sodium loading due to water softening. It is unlikely to ever be helpful to the absorption field.