Vetiver Grass And Its Application For Treatment Of Sewage Effluent

I participate in a number of Internet discussion groups. Recently questions were raised as to the problems caused by seepage from overfull household sewage tanks polluting the adjacent beaches on Caribbean Islands. Raw sewage on the rampage, whether from overfull sewage tanks, improperly operated public sewage systems, or from sewage filled drains is often a problem in poorer countries and contributes to health and other problems. Vetiver grass, can in some instances be used, very effectively as a mitigation technology. In its most simplest form it can be planted as a mini wetland at the outlet end of a private household sewage tank to dry up excess seepage, and on a larger and more complex scale it can form the basis of for a constructed wetland as a means to finally "clean" the output of public sewage plants.

In Australia practical demonstration of both has shown very good results.

It has been used at Beelarong, Queensland, to "dry up" seepage and remove pollutants from small septic systems (documented at: http://www.vetiver.com/AUS-Beelarong.pdf). In summary: "Results demonstrated that "Monto" Vetiver grass is very effective in treating Beelarong blackwater in an evapotranspiration bed. Total nitrogen pre-treatment was 95 mg/L compared to 16 mg/L after two rows of Vetiver and 1.2 mg/L after five rows of Vetiver. Faecal coliforms pre-treatment were 500 organisms/100mL and post-treatment approximately 50 organisms/ 100 mL in both wells. Total phosphorus was low pre-Vetiver treatment at 1.3 mg/L but declined further with Vetiver treatment." This was achieved with only 200 plants.

Another paper, http://www.vetiver.com/AUS_ekeshire01.pdf describes how vetiver has been used for larger sewage treatment programs. In all cases vetiver reduces the levels of nitrates, phosphates and BODs very significantly. Note how as vetiver continues to develop its root system in the second year its pollution mitigation impact more than doubles.

The results were as follows:

Tests	**Plant Influent**	**Plant Effluent 2002/03**	**Plant Effluent 2003/ 2004**
H (6.5 to 8.5)	7.3 to 8.0	9.0 to 10.0	7.6 to 9.2
Disolved Oxygen (2.0 minimum)	0 to 2 mg/l	12.5 to 20 mg/l	8.1 to 9.2 mg/l
5 Day BOD (20 - 40 mg/l max)	130 to 300 mg/l	29 to 70 mg/l	7 to 11 mg/l
Suspended Solids (30 - 60 mg/l max)	200 to 500 mg/l	45 to 140 mg/l	11 to 16 mg/l
Total Nitrogen (6.0 mg/l max)*	30 to 80 mg/l	13 to 20 mg/l	4.1 to 5.7 mg/l

Total Phosphorous (3.0 mg/lmax) *	10 to 20 mg/l	4.6 to 8.8 mg/l	1.4 to 3.3 mg/l

* Licence requirements. (N and P levels are possible future requirements)

Some of you may be asking why introduce this topic to this newsletter. There are three good reasons: (1) vetiver hedgerows apart from reducing sewage pollution is reducing the erosive force of outflows from these dysfunctional sewage systems and at the same time stabilizing the area of use; (2) vetiver is removing pollutants before they can pollute downs stream resources; and (3) it is my firm belief that as soil conservationists we need to look beyond the narrowness of our science and utilize good soil conservation practice techniques for other purposes when and where applicable.

The Vetiver System is in many ways unique in that it has such a wide range of applications across many sectors.

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