

THE POTENTIAL TO REDUCE NUTRIENT POLLUTION IN LANDFILLS PROTECTIVE- AND PLANT LAYERS BY PHYTOREMEDIATION

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Abstract

Surface water from the plant layer within some areas at the Filborna landfill in Helsingborg have, since the final coverage was carried out in 2004 -2005, had too high levels of nutrients (nitrogen and phosphorus). The run off water has high concentrations of nutrients and needs to be treated at NSR's treatment plant for leachate instead of being discharged directly to the recipient. The high levels are a result of application of a soil (plant layer) that are very rich in nutrients (a mix of food waste compost and sewage sludge).

The purpose with NSR's pilot case, in the project "Baltic Phytoremediation -BAPR" funded by the EU's Interreg South Baltic program, is to test phytoremediation as an effective, practical and economic solution to reduce the nutrient levels in the landfill protective and plant layers. The aim is to reduce the concentration of nutrients in run off water to levels acceptable to the recipient. There might also be positive side-effects, for example utilization of biomass (biochar or biogas) and positive effects related to the ecosystem.

The paper describes how to choose and test different plants in combination with an appropriate maintenance program, including the disposal of the biomass for example as a substrate for biochar production.

The test includes experiments on a larger scale at the landfill as well as in culture beds. The purpose of the experiments on the existing landfill is to highlight the practical aspects of using plants for nutrient uptake, for example: Soil preparation, establishment, maintenance, harvesting and biomass removal.

The purpose of the cultivation beds is to study the chemical and physical conditions regarding nutrients in soil and soil water under more controlled conditions. The test is planned to last for two years.

Keywords: high nutrients soil, reduce nutrients in soil, biochar, root depth, landfill, *Miscanthus*, *Phalaris arundinacea*, *Reed canary grass*