

Technology

Novel system using floating plant mats for treating waste water for agricultural reuse

Research organization



Vita 34 AG business unit BioPlanta is a team of engineers and scientists highly specialized in bio- and phytotechnologies. BioPlanta renders engineering and consulting services for passive treatment and recycling of municipal, industrial waste water, landfill leachate and mine water in international projects.

Description of the technology being developed

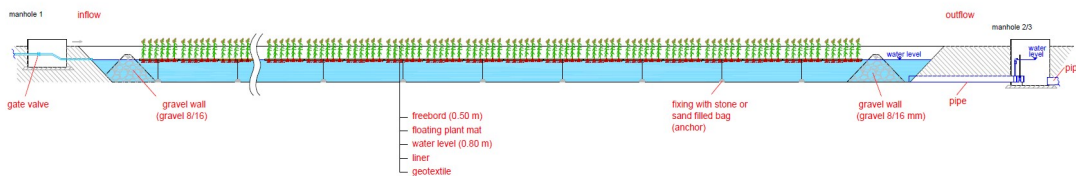
In a novel approach floating mats were developed using dried bamboo sticks and coconut tissue. Based on pre-tests using hydroponic systems in greenhouse *Carex acuta* (sedge) and *Scirpus lacustris* (bulrush) were selected for planting of floating mats for field trial.

In field trial efficiency of removal of pathogens pre-treated sewage was investigated. Sewage was discharged from main municipal waste water treatment plant of city Leipzig (Germany). In total three systems were installed, operated and monitored about six months (from June to December 2015).

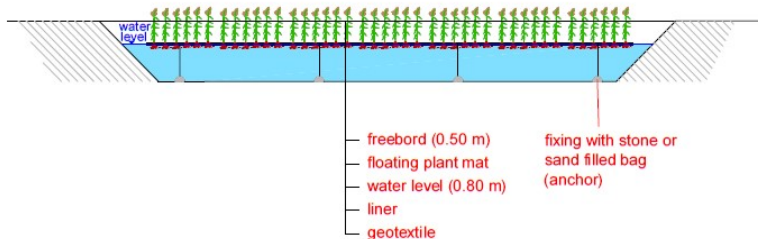
Vita 34 proved that floating plant mats represent a suitable method for removal of *E. coli* from pre-treated municipal waste water. Removal of *E. coli* for tested systems with planted mats was about 92 to 100 %. For enterobacteria removal ranged between 54.5 to 100 %, for coliform bacteria between 60 and 100 %.

On the base of results of field trial a full scale design, cost estimation and cost comparison were developed.

1) longitudinal section



2) cross section





Prototype of floating plant mats in Avilés, Spain (Layman Report, LIFE02 ENV/E/182)

For a community of about 3,000 inhabitants floating plant mats of about 1,500 m² in total are needed. Floating plant mats were installed in sealed basins which are constructed by excavation, profiling of slopes and sealing using a plastic liner.

Benefits	Pathogen removal from waste water before use for irrigation
Financial viability	In case of a small community with about 3,000 inhabitants (360 m ³ /d waste water) about 35,000 USD investment costs (depends on site conditions and local costs for material and construction services) and 2,050 USD operation costs per year are estimated. Treated water can be re-used for irrigation of crops.
Potential users	Small and medium sized communities (decentralized) and industry
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