

SWEDISH EXPERIENCES WITH APPLICATIONS OF MUNICIPAL AND INDUSTRIAL RESIDUES ON LARGE-SCALE SHORT-ROTATION COPPICE PLANTATIONS

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Short-rotation coppice (SRC) with willow (*Salix sp.*) is a commercial crop in Sweden grown on approximately 15,000 hectares of agricultural land to produce biomass for energy. The produced biomass is almost entirely used in district heating plants for combined heat and power generation. In recent years, nutrient-rich residues, mainly municipal and industrial wastewaters as landfill leachate and log-yard runoff, as well as solid material as sewage sludge and wood-ash, have been successfully applied to willow SRC to reduce fertilisation costs and simultaneously increase biomass production and/or facilitate alternative low-cost treatments. Pollutant and nutrient contents in residues and soils are reduced through plant uptake and microbial degradation, and at the same time biomass production is enhanced. The information provided will describe operating systems in Sweden where large-scale willow SRC plantations treat different residues (municipal wastewater, landfill leachate, log-yard runoff, sewage sludge, wood-ash) and simultaneously produce biomass. This presentation also will give results from research efforts to estimate parameters of special environmental concern (e.g., nutrient leaching, plant stress tolerance, heavy metal fluxes) related to such applications, in an effort to evaluate the risk of environmental hazards from such practices.

KEY WORDS: willow, *Salix*, Sweden, phytoremediation, vegetation filters, municipal wastewater, landfill leachate, log-yard runoff, sewage sludge, wood-ash

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