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# Agronomic fertility of dam sediment for soil construction in urban greening

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## Abstract

There is today a growing demand to develop green spaces in city, as they provide a support for biodiversity and can contribute to ecological connectivity with surroundings. Greening urban areas requires large amounts of arable soil that is a non-renewable resource. The purpose of our study is to determine whether river dam sediments can be used as alternative materials to preserve soil resource. Indeed, sediments are natural materials coming mainly from soils erosion available in large volumes (several hundred thousand cubic meters each year in France coming from EDF hydraulic power installations).

We studied four sediments coming from four hydroelectric plant dams showing differences in texture, mineral composition and initial organic matter content, that were compared with an agricultural loam soil. The sediments and the control soil were used alone or mixed with green waste compost. Each substrate was put into individual instrumented lysimeters (350L) in July 2015 sown with *Lolium perenne* and placed under natural outdoor conditions over a three-year period. Experiments in greenhouse under controlled conditions were also conducted to understand fine process.

In both experiments following parameters were measured:

Physical properties: aggregate stability, bulk density, hydraulic conductivity at saturation, porosity; chemical properties: pH, CEC, organic matter content, nutrients contents; biological properties: potential of mineralization of C, microbial and fungal biomasses, plant biomasses.

First results show that after six month, all sediments with or without compost favored plant development with differences in grass development depending on the sediments properties. Compost addition seems improve micro-organism performance in substrates.

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**Keywords:** organic matter, microbial and fungal biomass, ray grass, soil properties, dredged material