



Use of compost to restore a contaminated site in Southern Italy: preliminary study to assess compost efficiency in remediating a heavily polluted soil in Taranto city.

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Soil pollution is one of the most soil relevant threats recognized in the world. Contamination affects soil quality and soil capacity to react against several land degradation processes (erosion, organic depletion, desertification, etc.). The identification of opportune strategies to hinder pollution is a fundamental requirement to restore soil quality. In particular, large attentions have got the techniques, which promote the decontamination, and at the same time, improve fertility allowing a new use of a soil restored.

In this work we present a preliminary study to assess the use of compost (an organic fertilizer produced through a process of transformation and controlled stabilization of selected organic waste at the source) in remediating a heavily polluted soil in southern Italy. The study site is located in Taranto city (Apulia Region) and is contaminated predominantly by heavy metals and lightly by organic toxic compounds such as polychlorinated biphenyls (PCBs). An exhaustive chemical characterization has been carried out on soil samples and then, a treatment with compost was applied on the study site. Successively, two data acquisition campaigns have been realized (after 4 and 7 months by compost treatment, respectively).

Soil chemical analyses of texture, electrical conductivity, pH, organic carbon content, total nitrogen, available phosphorous, carbonate and water content have been carried out to investigate soil properties.

In the polluted site chemical analyses of characterization showed low content of nutrients (nitrogen and phosphorous) and high level of carbonate. Heavy metals screenings, carried out through ICP-MS equipment, evidenced a massive contamination by Be, Se, Sn, Pb, Cr, Zn, while GC-MS investigations revealed a lower pollution by PCBs.

The results of the monitoring campaigns showed a consistent reduction of the heavy metals concentrations: a higher decrease is observed after 7 months by compost treatment. At the same time, a considerable increase of organic carbon, nitrogen and phosphorus is also registered.

The overall results suggest that the use of compost contributed to improve soil physico-chemical properties and promote a relevant decrease of pollution suggesting that a process of soil quality restoration is performing.