



Fertility of Technosols constructed with urban wastes

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Growing plants in urban areas requires large amounts of arable earth that is a non-renewable resource. Increase of urban population leads to the production of large quantities of wastes and by-products that are only partly recycled as a resource and quite systematically exported out of urban areas. To preserve more natural soil resources (forest and agricultural soils), a strategy of waste recycling as fertile substrates is proposed. Eleven wastes are selected for their environmental harmlessness and their contrasted physico-chemical properties for their potential use in pedological engineering. The aim is (i) to demonstrate the feasibility of the construction of fertile substrates exclusively with wastes and by-products and (ii) to model their physico-chemical properties following various types, number and proportions of constitutive wastes. Twenty-five binary and ternary combinations are tested at different ratios for total carbon, Olsen available phosphorus, cation exchange capacity, water pH, water retention capacity and bulk density. Dose-response curves describe the variation of physico-chemical properties of mixtures depending on the type and ratio of selected wastes. Quite all of the mixtures have properties very near to those of natural soils. Some of them present more extreme urban soil features, especially for pH and POlsen. The fertility of the new substrates is modelled by multilinear regressions for the main soil properties. This allows to predict the fertility of constructed Technosols and participates to the development of soil eco-conception in urban and industrial areas (Rokia et al., Modelling agronomic properties of Technosols constructed with urban wastes, Waste Management (2013), 10.1016/j.wasman.2013.12.016).

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