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# Technosols colonization by macrofauna and vegetation

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## Abstract

The growing urbanization leads to soil degradation, while urban people are demanding more greenspaces for leisure activities and gardening. To meet this demand, topsoil is imported from agricultural and natural environments. This practice is quite expensive, produces greenhouse gas emission during transport and leads to agro-ecosystems degradation. An alternative is to create a "constructed Technosol" from urban wastes. In parallel, it will solve the problem of their storage and recycling.

In collaboration with a private company and local authorities, we set up an experiment of 26 plots for a total area of 4500 m<sup>2</sup> (n = 3 or 4 per treatment). Several mixtures of materials were tested, with earth excavated from deep horizons, crushed concrete and/or green-waste compost. Three types of vegetation were implanted on these Technosols: trees, grassland and crops.

A three-years monitoring reveals that after one year, in grasslands, macrofauna density and family diversity reaches respectively 20% and 50% of those retrieved in surrounding soil. The addition of 10% compost in Technosols reduced by half the diversity of macrofauna. But the second year, density and diversity were not significantly different from the surrounding soil.

During two years of experiment, compost in grasslands did not have effect on total plant diversity. However, in the second year, more species of sowing floristic cortège have developed on Technosols without compost.

Compost addition decreased diversity but could also improve biomass production on crops. In conclusion, varying compositions of Technosols could be an efficient way to manage green spaces depending on our interest.

**Keywords:** Colonization, Constructed Technosols, Macrofauna, Plant diversity, Wastes mixtures

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