



No Waste

#4

December 2017

Newsletter of Project LIFE No_Waste

LIFE14 ENV/PT/000369 - MANAGEMENT OF BIOMASS ASH AND ORGANIC WASTE IN THE RECOVERY OF DEGRADED SOILS: A PILOT PROJECT SET IN PORTUGAL

>>> In the Spotlight: Importance (and quality) of soil organic matter

Mining soils are impoverished systems in which biological activity and diversity are often threatened. Besides that, inadequate land management of soils in the Mediterranean region has led to a reduction of their organic matter content.¹ Decline in the organic matter is therefore an important cause of soil degradation, leading to malfunctioning of soil biological activity, damages in soil fertility and loss of carbon storage capacity, which consequently hinders a sustainable management of resources.

Organic materials from large-scale processes, such as **biological sludge (BS)** from wastewater treatment processes, have received attention in view of development of additives for recovery of some soil functions. Land application of BS has been proposed to **refill the organic matter stocks needed for soil biological activity, and it also allows recycling of N, P and other macronutrients.**² Main advantages include widespread availability and a high content of organic matter (typically more than 78%) comprising proteins, lignin, carbohydrates, lipids and celluloses, which can be utilized by soil microorganisms.³

However, BS may contain unstable organic matter and pathogens, which may pose environmental and health risks, releasing malodours from volatile organic compounds and ammonia or causing genetic damage to several plants.² For this reason, pre-treatment of sludge before land application has been much recommended.⁴ In particular, **sludge composting** has been proposed as the most reliable approach: composted BS appears to be more appropriate as soil conditioner due to a higher content in more stable and humified organic matter, thus improving long term soil fertility and quality.³

¹Nunes et al. (2008). *Bioresource Technology* 99 doi:10.1016/j.biortech.2007.09.016

²Rossini-Oliva et al. (2017). *Chemosphere* 168 doi:10.1016/j.chemosphere.2016.10.040

³Rantala et al. (1999). *Water Science & Technology* 40(11-12) doi:10.1016/S0273-1223(99)00717-9

⁴Alvarenga et al. (2015). *Waste Management* 40 doi:10.1016/j.wasman.2015.01.027



>>> Project updates

New pot experiment running on selected mining soils!

Combined effect of biomass combustion fly ash granules and pulp mill sludge compost on soil behavior

Experimental matrix of this full factorial experiment covers:

- 3 fly ash granules application rates
- 3 sludge compost application rates
- 3 watering regimes
- sowing of mining soil native plants

Intermediate results have shown that sludge compost results in sudden pH increasing, while ash granules allow for gradual pH rising



>>> What else is new?

Project presentation at the 18th EMEC

on 26th November 2017 entitled:

Waste Management From Pulp and Paper Industry: Recycling to Soil as a Viable Management Option

"Addition of soil improvers led to an increase in the pore water pH relative to control pots (0% of soil improvers added), and had an impact on the solubilisation of both macro- and micronutrients. These results provided information on adequate dosages of soil improvers to be added to soils for the correction of soil acidity.", wrote the authors.

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