

## **0286 - HEAVY METAL DYNAMICS IN A CALCAREOUS SOIL AFTER THE ADDITION OF SEWAGE SLUDGE COMPOST**

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Agronomic valorization is a common form of reusing the nutrients contained in organic wastes and a way of increasing the organic matter content in agricultural soils, normally depleted as a consequence of an intensive management of soils. But at the same time, organic wastes from urban origin, refuse of sewage sludge, could contain important amounts of organic or inorganic pollutants, mainly heavy metals that could be accumulated in soil and could constitute an important environmental risk. The control of the total amount that could be added to soil and the dose are important parameters that could be adapted to specific soil and crop characteristics. In this work, sewage sludge compost (SSC) was applied to a Calcaric cambisol, located in Villafruela (Burgos, Central Northern Spain), in which a traditional three years oleaginous-cereal-legume rotation was in practice. In the experience, three different doses of SSC, 3.5, 7.5 and 17.5 t/ha, and two controls, with and without inorganic fertilization, were applied to different 10x24 m plots in a randomized block design with five replicates per treatment; the SSC was applied in two times in non consecutive years. Soil and plant samples were taken yearly after the harvest of the different cultures: sunflower, barley and vetch and their chemical properties and heavy metal content analysed using normalized test methods. Plots receiving fertilization with SSC displayed statistically significant increases in crop yields in comparison to the control without any fertilization and with a response proportional to the dose; however, only with the highest dose (17.5 t/ha) the crop yield is higher than the control with inorganic fertilization. Compost addition also affected soil properties with temporary increases in soil salinity, organic matter and total N contents but without any residual effect one year later. There was a net, statistically significant accumulation of P-Olsen and in the total content of several heavy metals such as Zn and Cu, also proportional to the dose of SSC that was applied. Non-significant increases of total Pb and Cr were also found. Heavy metals in plant samples had more plant-specific response; cereal species, sunflower and barley, specifically accumulated several highly mobile metal ions such as Cu, Ni and Zn, even less mobile metals such as Cr or Pb, showed high values in roots. Heavy metal concentrations in grains were not increased in any of the treatments.