Investigation of microbial communities and micronutrients in sheep manure fertilized soils with a pH gradient

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Microbial communities play a central role in vital soil processes such as nutrient flow and the transformation of organic matter into bioavailable forms for other organisms[1]. The aim of this study was to assess the microbial community and micronutrient content in soils of identical origin with differing pH, whilst being incubated with sheep-manure. Understanding the effect of pH and manure application on the relationship between microbial communities and micronutrients will help to optimise nutrient bioavailability for plants. Phospholipid fatty acids (PLFAs) were analysed by GC-MS and the results used to characterise microbial communities in the experimental soils. In addition, selected essential micronutrients were extracted *via* low molecular weight organic acids to mimic those leaching from plant roots and arising from of microbial activity.

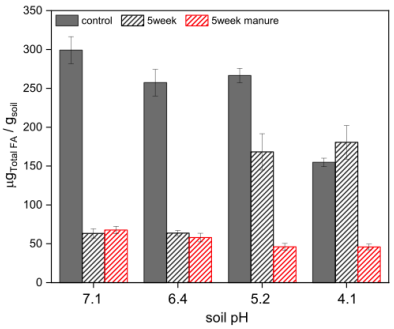

Figure 1. The change in total fatty acid concentration for control (t=0, without manure), 5 week (t=5, without manure) and 5 week manure (t=5, with manure) soils with pH.

Our results reveal that soil pH affects the microbial community size and a 5-week incubation with added manure transforms the microbial community indirectly by changing the soil pH. Moreover, the availability of micronutrients varies with soil pH by changing their speciation, which also affects their mobilisation.

1. P. G. Falkowski, T. Fenchel and E. F. Delong, *Science*, 2008, **320**, 1034-1039.