Testing indicators for soil biodiversity and ecological function in the European FP7 project EcoFINDERS

Indicators for soil biodiversity and function

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One of the aims of the European Commission project 'Ecological Function and Biodiversity Indicators in

European Soils' (EcoFINDERS) is the design of policy-relevant and cost-effective indicators for monitoring soil biodiversity to aid the implementation of European soil policy. To that end we generated a list of 19 potential indicators (selected using a logical sieve exercise) that covered a range of methods including traditional (i.e. respiration, nitrification) and developing (i.e. functional gene analysis) approaches, faunal (from earthworms to protozoa), microbiological (i.e. PLFA, TRFLP) and functional (i.e. water infiltration, suppressiveness) analysis, and in-situ (i.e. bait lamina), intact (i.e. soil cores), and composite soil sampling methods. The purpose of the field sampling was, first, to determine the sensitivity of the indicators to land use change and, second, to evaluate the cost-effectiveness of the individual methods. Where possible we made use of existing long-term sites that would have background and baseline data that would allow calibration of the EcoFINDERS results. To ensure European coverage and applicability we selected agricultural (arable) sites from Atlantic, Continental, Mediterranean and Pannonian climatic zones, along with Atlantic and Continental grassland sites. At each site there were three replicated plots of two contrasting land use types. One of the land uses was considered a control, which had baseline data available, against which the contrasting land use was compared. The comparisons included: tillage vs. no-tillage; cereal vs. fallow; conventional vs. organic arable management; and intensive vs. extensive grassland management. The first sampling at all six sites took place in autumn 2012 and complete analysis of all samples is scheduled for completion by May 2013. Subsequent sampling will take place in spring and autumn 2013. Details of the sampling effort required for each indicator is already revealing some interesting observations. We will discuss the sampling strategy and the results from the first sampling. The sensitivity of the indicators to the land use changes will be evaluated and initial results on the cost-effectiveness of the indicators presented.