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Solid-state ^{13}C-NMR spectra of HF+ $K_2Cr_2O_7$-treated samples demonstrate chemical differences in the composition of COREC of the individual soils. Whereas in deeper horizons of CU-1 dominated carboxylic-C and carbonyl-C, in CU-2 the contribution of aromatics increases with depth revealing that a part of the stabilized SOM occurs as *black carbon*. Our results confirm that such black carbon represents an important fraction of subsoil SOM.

P217
15N-DNA Stable isotope probing and active soil microbial community in plant residue decomposition process

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Knowledge of soil organic matter (SOM) turnover is essential for understanding nutrient cycling. SOM turnover is largely controlled by microbial communities, however most of soil microorganisms are still unknown and very few have been directly related to their function in specific soil processes. The recently developed DNA-Stable isotope probing (SIP) technique allows direct observations of substrate assimilation in microbial communities and represents an interesting new tool for linking microbial identity and function. To identify the active microbial community involved in the decomposition process of crop residues, an incubation experiment was conduced with highly 15N-enriched residues (90 atom %) incorporated (1%) in a Vertisol soil, taken from a long-term field experiment carried out in Venezuela since 1997. The residues were incubated for 30 days (25 oC) at 40 % WHC. A control without residue was also used. Microbial activities (CO2 evolution, ergosterol content, enzymes activities, C and N biomass) were measured after 3, 7, 15 and 30 days. DNA was extracted and the active and passive community was analyzed by using the 15N-DNA stable isotope probing (SIP) and molecular (DGGE, cloning and sequencing) techniques. The results showed that residue additions stimulated soil microbial activities and the 15N-DNA stable isotope probing technique allowed the isolation of the active bacterial and fungal community involved in the decomposition process

P218
Fertilizer type and rate: effects on labile carbon and nitrogen pools in a long-term trial on a sandy Cambisol

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Type and rate of fertilizers influence the level of soil organic carbon (C_{org}) and N markedly, but the effect on labile C- and N-pools is open to question. Objectives were to investigate the impact of fertilizer type and rate on labile C- and N-pools on a sandy Cambisol. From the 27 year old long-term experiment in Darmstadt, six treatments were compared: application of mineral fertilizer with straw-yield incorporation (MSI) and application of farmyard manure (FYM), both at high, medium and low rate.
Soil microbial biomass C (C_{mic}) and N (N_{mic}) were determined. In an incubation experiment (266 days, 10 °C, 55 % WHC), we assessed CO_2-C and netto-N-mineralization. An exponential two-pool model was fitted to the mineralization data for separating labile C- and N-pools (C_1, C_2, N_1, N_2).
In all treatments, stocks of C_{org} declined since 1982. N stocks were maintained in the FYM treatment at high and medium rate. MSI treatments had lower C_{mic} (308 - 361 kg ha^{-1}) and N_{mic} (42 - 48 kg ha^{-1}) stocks than FYM treatments (404 - 520 kg C_{mic} ha^{-1} and 60 - 68 kg N_{mic} ha^{-1}). After 266 days, mineralized C (1132 - 1817 kg ha^{-1}) was significantly different between rates and increased in the order low > medium > high. Netto-mineralized N (91 - 125 kg ha^{-1}) increased in the same order. The pools C_1 and N_1 were small (1.3 - 1.8 % of C_{org}, 0.5 - 1.0 % of N) and independent of treatments. The pool C_2 comprised 7.1 - 12.5 % of C_{org} and increased with increasing input. Between 3.8 and 4.9 % of N were stored in the pool N_2.
Our results indicate that the sizes of labile C- and N-pools were governed by the rate and those of the non-labile pools by the type of fertilizer.

P219
Soil organic carbon and nitrogen dynamics in soils amended with organic residues

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The application of organic residues to soils have received considerable attention recently, due to the sequestration of atmospheric carbon and the subsequent increase in soil productivity and fertility. Added organic matter is beneficial especially in the case of soils susceptible to degradation (with low organic matter content). Such soils are typically found in the Southeastern Mediterranean zone. Thus in an incubation experiment, a soil from Greece with low organic matter content was amended with four different organic residues (cattle manure, pig manure, poultry litter, and sewage sludge) at a rate equivalent to 200 kg N ha^{-1}, and was tested for a period of one year. During that time organic carbon, as well as nitrogen mineralization were monitored. Inorganic fertilizer was also added to the soil at similar nitrogen rate. For comparison, a second soil from Romania, with high organic matter content was also amended with the same organic residues and inorganic fertilizer and was incubated along the other soil. It was found that soil organic carbon increased significantly in both amended soils. Although organic carbon decreased over the time, at the end of the incubation period organic carbon was still higher in the amended soils compared to the unamended. Nitrogen release was slower in the amended samples than in the samples with inorganic fertilizer, and this showed the agronomic benefits of using organic residues.

P220
Decomposition of tropical tree litters: Impact of litter quality on C mineralization kinetics and soil organic matter characteristics

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Tree litters and more particularly the tropical ones are recognized to have high levels of polyphenols and lignins. Polyphenols are the most abundant class of plant secondary metabolites and are mainly distributed in the vacuole of cells (soluble fraction) while lignin is an important polymer of plant structural C (cell walls). These compounds are both recognized to slow down litter decomposition and N mineralization rates. However, this relationship between litter quality and rate of decomposition is not quantified and moreover not fully explained yet. In addition the impact of initial intrinsic quality of such litters on soil organic matter chemical characteristics was not reported. For instance, is there a qualitative continuum between the initial characteristics of lignin polymer in the tree litter and that found in soil after decomposition?
The aims of our study were to i) better characterize the role of litter composition in slowing down C and N mineralization