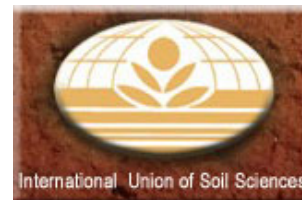




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Soil Organic Matter and Microbiology of Mollisols, Vertisols and Oxisols: Effect of Native and Agroecosystems.

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The objective of this research was to evaluate the effects of agroecosystems on the soil total C and N (TC and TN), aggregation and microbial community composition. Samples were taken from three sites: a Mollisol (Kansas, USA), an Oxisol (Brazil), and a Vertisol (Argentina). All three sites included a native prairie, and no-till and tilled cropping systems. Soil from the Oxisol was sampled from an experiment located at FUNDACEP, Cruz Alta (RS), Brazil. The soil was classified as clay Rhodic Hapludox. Tillage systems were conventional tillage (CT) and no-tillage (NT) under black oat/soybean/black oat + vetch/maize/radish oil (*Raphanus sativus* L.)/wheat/soybean rotation. Soil from the Mollisol was sampled from a long-term tillage experiment located in Manhattan, KS, USA. The soil was classified as fine-silty, mixed, superactive mesic Cumulic Hapludoll. The treatments were conventional tillage (CT) and no-tillage (NT) under continuous maize rotation. The Vertisol was sampled from an experiment located at INTA Parana, Entre Rios, Argentina. Treatments were reduced-tillage (RT) and no-tillage (NT) systems under wheat/soybean-maize rotation. All sites had native grassland for comparison. Soils samples from Brazil and Argentina were taken in August and from the USA in November 2005 at 0-5, 0-15 and 15-30 cm depth. Total C and N were determined by direct combustion using a Carlo Erba C/N Analyzer. Microbial community composition was determined phospholipid fatty acids (PLFA). Aggregate size distribution was determined by wet sieving and separated into >2000, 250-2000, 53-250, and 20-53 mm aggregate-size classes. The C and N concentration of the individual aggregate size classes were also determined. In the Mollisol, NT had significant greater TC and TN concentration compared with CT at 0-5 cm. However based on concentration there were no differences in TC and TN between tillage systems at the 0-15 and 15-30 cm depths. In the Oxisol, TC and TN concentrations were significantly greater under NT than CT at 0-5 cm ($P < 0.05$) and 0-15 cm ($P < 0.10$), but no differences were observed at 15-30 cm. In the Vertisol, there were no significant differences between tillage systems at 0-15 and 15-30 cm in the TC and TN concentration. Values will be adjusted for bulk density. Preliminary analysis indicated that the macroaggregates (>250 μ m) were greater in the no-till systems for the Mollisol and Oxisol. Comparisons will be made to the native system and between soils.

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