

Project Summary

Title	Soil properties effects and management of organic residues to improve C sequestration, reduce N losses and improve crop yields
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Purpose	The overall objective of this proposal is to explore the effects of soil management practices on C sequestration in soils, losses of N and improvement of maize yields.
Project Summary	Rates of decomposition of organic materials in soil determine the amount of carbon (C) which is mineralized and released as CO ₂ versus the amount of C that is retained in various forms in the soil. Decomposition rates also greatly influence the amount of nitrogen (N) which becomes available for plant uptake or susceptible to leaching versus that which is retained in SOM or lost via gaseous emission. The processes that follow the decomposition of residues by microorganisms are strongly influenced by soil chemical and physical properties, and also by plant roots via the processes of mineral N uptake, respiration, exudation and decay. The equilibrium between carbonates, bicarbonates, CO ₂ and pH controls inorganic C losses and deposition over large areas of arid and semi-arid climates and should be linked to the biological cycle of C. However, few quantitative relationships between decomposition rates of organic manures & wastes (OW) and controlling edaphic, climatic and biotic variables have been determined. The overall objective of this proposal is to explore the effects of soil properties and management practices on C sequestration in soils, off-site losses of N and crop productivity. The methodology includes the simultaneous use of

	laboratory and field experiments with stable isotopes of N and C to follow the dynamics of N and C. Best management practices will be identified by field experiments and simulation scenarios with the process oriented computer simulation models of N and C transformations in a soil-OW-plant system (NCSOIL).
Country and Specific Location(s)	Kenya
Participating Institutions	Community Based organisations
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End date	September, 2012
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