



Soil tillage conservation and its effect on erosion control, water management and carbon sequestration

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The energetic function of the soil expressed through the potential energy accumulated through humus, the biogeochemical function (the circuit of the nutrient elements) are significantly influenced by its hydrophysical function and especially by the state of the bedding- consolidation, soil capacity of retaining an optimal quantity of water, and then its gradual disponibility for plant consumption. The understanding of soil functions and management including nutrient production, stocking, filtering and transforming minerals, water , organic matter , gas circuit and furnishing breeding material, all make the basis of human activity, Earth's past, present and especially future. The minimum tillage soil systems – paraplow, chisel or rotary grape – are polyvalent alternatives for basic preparation, germination bed preparation and sowing, for fields and crops with moderate loose requirements being optimized technologies for: soil natural fertility activation and rationalization, reduction of erosion, increasing the accumulation capacity for water and realization of sowing in the optimal period. By continuously applying for 10 years the minimum tillage system in a crop rotation: corn – soy-bean – wheat – potato / rape, an improvement in physical, hydro-physical and biological properties of soil was observed, together with the rebuilt of structure and increase of water permeability of soil.

The minimum tillage systems ensure an adequate aerial-hydric regime for the biological activity intensity and for the nutrients solubility equilibrium. The vegetal material remaining at the soil surface or superficially incorporated has its contribution to intensifying the biological activity, being an important resource of organic matter. The minimum tillage systems rebuild the soil structure, improving the global drainage of soil which allows a rapid infiltration of water in soil. The result is a more productive soil, better protected against wind and water erosion and needing less fuel for preparing the germination bed.

Presently it is necessary a change concerning the concept of conservation practices and a new approach regarding the control of erosion. The real conservation of soil must be expanded beyond the traditional understanding of soil erosion. The real soil conservation is represented by carbon management. We need to focus to another level concerning conservation by focusing on of soil quality. Carbon management is necessary for a complex of matters including soil, water management, field productivity, biological fuel and climatic change. Profound research is necessary in order to establish the carbon sequestration practices and their implementation impact.