

## **Impact of tillage systems on surface soil properties in semi arid Morocco**

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Environmental and economical benefits from reducing tillage in production systems are enhancing adoption of no-tillage practices in the world. Undesirable effects of intensive conventional tillage systems on soil properties and processes are well documented. Potential improvement of soil quality under no-tillage systems is under intensive research. Among the soil quality improvement, it is agreed that no-tillage systems help reducing soil erosion, increasing soil cohesion and aggregation, enhancing organic carbon content and facilitating water flow in soil profile. In semi-arid Morocco, though plow-based tillage systems are still the most common, no-tillage research started in early 1980s emphasizing on water conservation, crop productivity amelioration and soil quality build-up. Experiment results have shown that on rich clay soils and in dry years, no-tillage systems favored higher cereal yields than conventional tillage systems. Among other desirable and pertinent results, it was found that no-tillage systems increased levels of total and particulate organic matter, water and wind stable aggregates and nutrients (phosphorus, nitrogen, potassium) and permitted higher capacity to store available water in seed-zone. Nevertheless, no-tillage effects became less pronounced with increased profile depth. In addition, no-tillage practices reduced soil water evaporation while improved water level and entry in soil surface. In other side, no-tillage systems did not have significant influence on soil temperature, pH, bulk density, calcium and magnesium content and cation exchange capacity. Consequently, no-tillage systems provided better soil features than commonly used tillage systems.

Key words: No-tillage, Soil Quality, Water Conservation, Carbon sequestration, Morocco