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Field evidence of soil redistribution and soil erosion by tillage

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Soil redistribution due to conventional tillage practices represents *per se* a process of intense transformation of the soil and geomorphic landscapes in agricultural lands. The accumulated long-term effects result in a modification of the soil profile and spatial patterns of soil variability. Moreover soil redistribution by tillage results in a severe modification of the landscape topography, and as a consequence on the surface and subsurface hydrology (e.g., variability of infiltration, overland flow paths...), which gives place to a drastic modification of the geomorphic process (e.g., slope stability, water erosion...). A better understanding of the implications of soil redistribution by tillage may require reinterpretation of current agricultural landscapes. This reveals the need for studies for identifying current landscape features produced by past repeated tillage practices, as well as for documenting the bio-physical implications (hydrology, water erosion, soil variability, soil quality, productivity...) derived of such landscape transformations. This communication presents several examples of field evidences observed in agricultural fields of Central Spain, Tuscany (Italy) and Central Minnesota (USA). The collection of field evidences are presented grouped according to the nature of the effects, into the following four classes: 1*) Landscape levelling and smoothing:* Features of change of the soil surface level; 2) *Modification of morphology of slope profiles:*Landscape benching by the formation of slope profile breaks at borders between adjacent fields located at mid-slope positions; 3) *Spatial variability of soil properties:* Spatial variability of soil properties in the superficial soil horizons, and

variability of soil profiles morphology along the slopes; and, 4) *Spatial variability of productivity*: Relationships between relieve and spatial variability of soil properties and productivity. Findings of this study reveal the importance of incorporating the process of soil redistribution by tillage into comprehensive models of soil erosion and hydrological process and the need to explore subsequent interactions and synergies. In addition, it is clear the need to define erosion risk indicators in order to predict trends in the extent and intensity of soil redistribution by tillage in agricultural landscapes.

Key Words: soil redistribution, tillage erosion, slopes morphology, soil variability, productivity