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Modeling the impact of conservation agriculture on crop production and soil properties in Mediterranean climate

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In Morocco, rainfed agriculture is practiced in the majority of agricultural land. However, the intensive land use coupled to the irregular rainfall constitutes a serious threat that affect country's food security. Conservation agriculture (CA) represents a promising alternative to produce more and sustainably. In fact, the direct seeding showed high yield in arid regions of Morocco but its extending to other more humid agro-ecological zones (rainfall > 350mm) remains scarce. In order to promote CA in Morocco, differents trials have been installed in central plateau of Morocco, to compare CA to conventional tillage (CT). The yields of the main practiced crops (wheat, lentil and checkpea) under CA and CT were analyzed and compared in the 3 soils types (Vertisol, Cambisol and Calcisol). Also, we studied the effect of CA on soil organic matter (SOM) and soil losses (SL) in the 3 different sites. The APSIM model was used to model the long term impact of CA compared to CT. The results obtained in this research have shown favorable effects of CA on crop production, SOM and soil erosion.
Key words: Conservation agriculture, yield, soil properties, modeling, APSIM, Morocco.