Geophysical Research Abstracts
Vol. 20, EGU2018-13338, 2018
EGU General Assembly 2018


# Modeling for successful long term crop rotation management under conservation agriculture in Tunisia

Haithem Bahri (1), Mohamed Annabi (2), Hatem Cheikh Mhamed (2), Roukaya Chibani (3), Zied Aidoudi (4), and Moncef Ben-Hammouda (4)

(1) INRGREF, ARIANA, Tunisia (haithem.bahri@gmail.com), (2) INRAT, Ariana, Tunisia, (3) IRA-Medenine, Tunisia, (4) ESA-Kef, Tunisia

In Tunisia, several factors are responsible for the difference between what agriculture offers as products and the increasing population demand. Therefore, water as a non renewable natural resource and is a major production limiting factor. Indeed, water in Tunisia is a scarce resource and its spatial and temporal distribution is highly variable which makes crop yields in the same trend over years and are substantially low compared to the potential yields. In addition, Mediterranean region has been retained as the hot spot for climate change impact. But, in order to attenuate partially what climate change may generate, conservation agriculture (CA) was introduced as a new ag-technology in Tunisia. Since 1999, areas cultivated under CA increased starting with 7 ha in 1999 to cover up to 14000 ha in 2015. It appeared that crop rotation management is a key for CA adoption. The objective of this work is to study its long term effect on wheat yield, soil carbon and soil water dynamics.
The assessment of such management, a modeling approach was applied using APSIM model (Agricultural Production Systems sIMulator) and wheat/faba-bean and wheat/chickpea rotations were studied. Future Climate data were processed using MarkSim website (2017-2035; 2045-2064; 2075-2094).
APSIM model was calibrated out of datasets from field experiments. Simulation results showed that rotation type has to do with the spread of CA in Tunisia. In fact, long term wheat yields are correlated directly with the previous crop. This relationship is explained by available soil water left over. Consequently, it is recommended to rethink crop rotation management, especially for semi-arid zones in order to deal with water scarcity due to global warming. With regards to soil carbon and soil water reserve, a net effect was associated to the type of rotation when practicing CA

Keywords: Crop rotation, APSIM, Long term simulation, Wheat yield, Soil organic carbon, Soil water reserve.