Effects of tillage and crop rotation on yield and quality parameters of durum wheat in Tunisia

Nadia Chaieb a1*, Mohsen Rezguia, Sourour Ayedb, Haithem Bahria, Hatem Cheikh M'hameda, Mounir Rezguia, Mohamed Annabi1

1 University of Carthage, Laboratory of Agronomy, National Institute for Agronomic Research in Tunisia, Hedi Karray street, 2049 Ariana, Tunisia.
2 University of Carthage, Laboratory of Field Crop, National Institute for Agronomic Research in Tunisia, Hedi Karray street, 2049 Ariana, Tunisia.
1 On transfer from Regional Office of Agriculture Development Research Semi-Arid North West, B.P. 221-7100 Le Kef, Tunisia to Regional Research Centre on Horticulture and Organic Agriculture (CRRHAB), University of Sousse, Chott Mariem 4042, Tunisia.
*a Corresponding author: Nadia CHAIEB E-mail address: chaiebnadiat@gmail.com

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1 ABSTRACT
Conservation agriculture has been proposed as an alternative to conventional agriculture to mitigate the climate change impact and ensure food security. This study examined the effect of three tillage systems, ((conventional tillage (CT), chisel tillage (ChT) and no tillage (NT)) and two crop-rotation systems ((two year crop rotation (2-yr) and three year crop rotation (3-yr)) on some yield and quality parameters of two winter durum wheat genotypes. The results showed that biological yield (BY) and thousand kernel weight (TKW) were neither significantly affected by tillage, crop rotation nor genotype. Only the genotype significantly affected grain yield (GY). Grain protein content (GPC %) showed higher values than straw protein content (SPC %) and NT negatively affected GPC%. Some significant differences of mineral elements were observed according to tillage system applied and NT showed the lowest values of grain N, straw K, straw Ca and straw Na. Tillage system, crop-rotation system and genotype had no effect on total phenolic content (TPC) and total flavonoid content (TFC). Highly significant negative correlation (-0.378**) was recorded between GY and grain N, and accordingly GPC%. The two winter durum wheat genotypes demonstrated that with the two crop-rotation systems, yields and most of quality parameters under NT and ChT were similar to those under CT. This study expands our knowledge on durum wheat chemistry variation in relation to agricultural system adopted and provides a basis for selecting the adequate crop-rotation system and genotype following the NT adoption in Tunisian semi-arid areas.