Res. on Crops **22** (1) : 32-39 (2021) DOI : 10.31830/2348-7542.2021.033
With eight figures
Printed in India

Reflection of the development of cultivation techniques on the growth and development of *durum* wheat (*Triticum durum*) in Algeria

ABDELOUAHID YACHI[1,*], MOHAMED AMINE FEDDAL[1], MAHFOUD AMARA[1], BAHA EDDINE BADOUNA[2], DJAMILA BENTAHAR[3], MOHAMMED NADHIR MEBARKI[1], SMAIN ECHCHERKI[1], HANA ANFAL BENSABTI[1] AND MOHAMED NADJIB ZIBANI[1]

[1]*Laboratory for the Control of Water in Agriculture*
Department of Agricultural Engineering
National Higher School of Agronomy (ENSA), ES1603, El Harrach, Algeria
**(e-mail : wahidosse@gmail.com)*

(Received : December 31, 2020/Accepted : March 17, 2021)

ABSTRACT

Soil management systems can affect soil physical properties and, thus, have a direct bearing on crop performance. This study determined the effects of conventional and no-tillage management on selected soil physical properties and compared observed yield differences between these tillage systems with soil physical properties. To achieve these goals, two technical tillage chains (deep tillage, Direct sowing), were compared in the same pedoclimatic and historical situations. The experiment was carried out on clayey soil in the experimental station of the Technical Institute for Field Crops, during 2017-18 agricultural campaign. Tillage methods significantly affected the soil physical properties as increase in soil moisture contents and decrease in Penetration resistance of soil was noted The soil moisture contents (21,25 %) and Penetration resistance (2,44 MPa) were maximum in direct sowing as compared to conventional tillage. Whatever the sowing rate, the number of seedlings raised per square meter is greater on direct sowing plots. Concerning the diameter and the length of the roots, and whatever the sowing dose, the large values were recorded in the plots worked conventionally. The yield is higher for direct sowing, it is 64.1 q/ha on the other hand, it is 61.1 q/ha for conventional work. All these results are very encouraging for a possible introduction of direct sowing in cereal crops in Algeria.

Key Words : Conventional tillage, penetration resistance, population density, root system, soil moisture, wheat, yield

INTRODUCTION

The demand for wheat (*Triticum* spp.) among Algerian consumers is constantly increasing, due to increasing urbanization. However, according to statistics, yields are low due to several climatic, genetic, technical and biological factors (Mebarki *et al.*, 2020). Apart from climatic factors, man can intervene in all the other factors to improve the production of this cultivated cereal. For this, the intensification of this culture requires the establishment of certain conditions for the use of improved varieties, some of which already exist in Algeria. The establishment of a sustainable cultivation system to improve the physical and chemical conditions of the soil, and finally the use of suitable fertilizers to maintain the soil's production potential.

There are in fact a large number of more or less well-defined cultivation systems or techniques for preparing the soil and planting crops. The classic approach consists of grouping them together according to whether they involve in-depth work or not, which gives two main groups, work with ploughing which

[2]Laboratory for the Life Sciences and Techniques, Institute of Agronomic and Veterinary Sciences, Taoura, Souk-Ahras, Algeria.
[3]Technical Institute for Field Crops (ITGC), El Harrach, Algeria.

Analysis of the combined effect of direct seeding with seeding depth on the behaviour of a *durum* wheat. *J. Soils Crops* **30** : 1-13.

Munoz-Romero, V., López-Bellido, L. and López-Bellido, R. J. (2015). Effect of tillage system on soil temperature in a rainfed Mediterranean Vertisol. *Int. Agrophys.* **29** : 467-73.

Naveen Kumar, B. T. and Babalad, H. B. (2017). Conservation agriculture to sustain the productivity and soil health in cotton and groundnut intercropping system. *J. Soils Crops* **27** : 24-33.

Pal, D., Patra, P. K. and Mukhopadhyay, D. (2018). Effect of tillage and organic residues on yield of wheat (*Triticum aestivum* L.). **19** : 373-79.

Parlawar, N. D., Jiotode, D. J., Kubde, K. J., Ajay Kumar Meena and Mohod, A. R. (2017). Effect of tillage on growth, yield and yield components in soybean. *J. Soils Crops* **27** : 192-98.

Roger-Estrade, J., Richard, G., Caneill, J., Boizard, H., Coquet, Y., Defossez, P. and Manichon, H. (2004). Morphological characterization of soil structure in tilled fields: from a diagnosis method to the modelling of structural changes over time. *Soil Till. Res.* **79** : 33-49.

Shrestha, J., Subedi, S., Timsina, K. P., Chaudhary, A., Kandel, M. and Tripath, S. (2020). Conservation agriculture as an approach towards sustainable crop production : A review. *Farm. Manage.* **5** : 7-15.

Shrestha, K. P., Giri, R., Kafle, S., Chaudhari, R. and Shrestha, J. (2018). Zero tillage impacts on economics of wheat production in far western Nepal. *Farm. Manage.* **3** : 93-99.

Stewart, B. A. (2007). Water conservation and water use efficiency in dry lands. In: Stewart, B., Fares Asfary, A., Belloum, A., Steiner, K., Friedrich, T. (Eds.), proceedings of the International Workshop on Conservation Agriculture for Sustainable Land Management to Improve the Livelihood of People in Dry Areas, 7-9 May 2007. ACSAD and GTZ, Damascus, Syria. Pp. 57-66.

Yachi, A., Amara, M., Feddal, M. A., Bentahar, D., Bouhouchine, M. and Belkacemi, A. (2020). Influence de deux techniques culturales sur la croissance et le développement du Bersim (*Trifolium alexandrinum*) en Algérie. *Fourrages* **243** : 63-69.

Zekkour, M. (2007). Effet de la fertilisation phosphatée sur le comportement et la population d'une culture de blé dur (*Triticum durum* Var. Dimeto) conduite en conditions sahariennes dans la région d'El Goléa. Thèse. Ing, Agro, Agro, ANFS/AS (Ouargla), partie expérimentale. pp. 103.