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Climate Change and Agriculture Conservation in Semi-Arid Environment

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Abstract

In the context of the climate changes, the cereals' culture appears relatively vulnerable because of some of his characteristics, as well physiological as socio-economic. Uncertain rain agriculture in the semi-arid and arid areas and their need hydrous annual negatively affects the production and the output in grains. The study of the ground various parameters (the ground humidity). And farming parameters output such as the rate of survey, the adventitious infestation and the corn grains yield and these components. The experimental device including the technical factor farming on three levels: zero tillage or direct seeding (DS), conventional tillage (CT) and simplified cultural technique (SCT) or minimum tillage (TM) and only one cereal species. The positive hydrous assessment in zero tillage and also yield components and the grain yield. The zero tillage, in addition to its advantages as regards evaporation reduction, makes it possible to fix well the cereal cycle. It also makes it possible the culture to benefit from the first year rains and to escape the dryness's from end from cycle. The application finality of this study is to mitigate some causing effects climate warming.

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Keywords: Technical farming, Durability, Conservation, Semi-arid;

1. Introduction

The African challenge illustrates dramatically the challenge we are facing: to feed the world sustainable. This challenge must be given a comprehensive response to which everyone must take his share, whether researcher or policy maker. To find solutions, scientists necessarily depart from the analysis of the crisis causes. Working on the prices volatility or drought, they seek to develop crops more resistant to the most extreme episodes and contribute at the same time to improve grain production essential to food [1]. The spring drought that often strikes the southern Mediterranean reflects the uncertainty in which live more and more farmers in Africa and in control. Faced with this situation two imperatives: wiser resources use and innovation [2].

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In Algeria, the water shortage in several parts of the country is lacking in certain places and certain times of the year. In semi arid areas, dominated by cereal crops, spring drought and lack of this resource affects annual production of grain and fodder. Hence, in less rainfall, it behooves us to retain water, recycle it, to help him infiltrate rather than to let slip away into the sea. And since agriculture accounts for 65% of the water consumed in Algeria in 2002, it must first contribute to these changes of practice [3]. The water collected in 2000 is estimated at 6.074 billion m^3, of which 3.938 billion for irrigation (65%).

The central characteristic of bioclimatic zone Mediterranean is summer drought with low rainfall during most of the year. Made even more important for us, the inter-annual irregularity and intra-annual rainfall. This contradicts the balance between technical itineraries conceived and management of real conditions of production in farms [4].

In rainfed agriculture cropping systems must also adapt to the new context marked by a more extreme water stress and extreme events more powerful. Essentially due to climate change, these phenomena are controlled by high temperatures and drought. These phenomena make the cereal timing cycle in a more difficult climate campaign [5]. The adaptation to this situation requires innovation. The genetic innovation, first of all by the improvement of crop resistance to drought. Agronomic innovation also: as working on new farming systems including new farming practices. Direct seeding is an alternative for preserving natural resources and preserve the environment while producing [1].

Climate change impacts may be observed at several levels; (i) Less predictability in crop yield, changing irrigation demand, growing risk of pest infestations, (ii) Loss of habitat, species and protective ecosystems, migratory shifts, (iii) Erosion, inundation, salinsation, stress on mangroves, marshes, wetlands, (iv) Variability in water supply, quality and distribution. More competition and cross-border conflicts over water resources, (v) Changes in forest composition, extend, health and productivity and (iv) Increasing incidents of infectious, water-borne and vector-borne diseases, heat stress and mortality, additional public health costs [6].

Lessons from international experience and the current debate on conservation agriculture urge for more investigation on the conditions and locations for success of adapted conservation agriculture based systems and their sustainability in these High Plains [7].
The experiments on conservation agriculture overall beneficial effects recorded environmental change. These experiences have highlighted the extent of the changes in the dynamics of CO2 in the soil with conservation tillage systems, as well as contributions from operations tillage and rainfall on the emission of CO2 in soils semi-arid Mediterranean conditions [8], in addition to the structural stability [9, 10] and the dynamics of organic matter [11].

This work, it will therefore measure the degree of organic matter in soil, density, infestation by weeds, yield components and grain yield real. The study area is often exposed to late frosts and warm southerly winds (siroccos). This is further complicated by a system cereal / livestock farming where crop residues are grazed by livestock and cannot, therefore, be recycled into the soil. So, we evaluated the influence of three cultivation techniques (DS, TC and TCS) on the evolution of organic matter in the soil and the behavior of the wheat crop cereals. The results showed that the conservation environment. The results show that the preservation, the cultivated ecosystem environmental awareness and the role of conservation agriculture seen enough to explain the difference between the three tillage technologies.

2. Materials and Methods

2.1 Study area

The work was carried out in the Setif high plains area (SHP) of north-eastern Algeria (36_11 North,