

## **Socio-economic and environmental benefits of direct seeding of wheat in Sétif high plains (north east of Algeria)**

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There is a growing realisation of the importance of sustainable agriculture throughout the world. This awareness has become the main topic of global debate as a result of prevalence of chronic hunger, famine and natural resource degradation. Direct seeding is an important element of conservation agriculture; it is associated with lower labour and operating energy inputs, more stable yields and improved soil nutrient exchange capacity. It contributes to environmental conservation and to sustainable agricultural production. By reducing the inter-seasonal variability of yield in low rainfall areas, mainly by limiting yield reductions in dry years, it increases farm income and reduced social and environmental risks. In addition, there are wider economic benefits of direct seeding such as the stimulus to the growth of the rural economy, particularly in agricultural systems characterized by low yields, low economic growth and severe poverty. Direct seeding reduces soil disturbance, increases infiltration, limits soil erosion, reduces requirement of external inputs due to significant increases in organic matter, allows the return of the biodiversity of soil, improve water use efficiency, and increases carbon concentrations in the topsoil. Conservation tillage can also reduce the amount of fossil fuel consumed in intensive tillage and by other farm operations and thus decrease the rate of CO<sub>2</sub> buildup in the atmosphere and preserve the climate.

Today, the global area of no-till farming is approximately 100 million hectares, equivalent to about 5 percent of cultivated land in the world. In Algeria, the land used by agriculture is approximately 7.5 million hectares, 80% of these areas are allocated to the cereal - fallow rotation, and grain yield average is around 900 kg per hectare. Sétif high plains (north east of Algeria) is characterized by a semi arid climate with a long term average annual precipitation ranging between 300 and 400 mm, the dry-farming system is commonly used, it is based on cereal/sheep production in a cereal fallow rotation. In this region, direct seeding of cereals has recently been adopted, there is almost 8 years. In the light of this situation, the aim of the present research is to identify and analyse the economic and other conditions that spur farmers to adopt direct seeding practices. The results of this economic study show that direct seeding, relatively to conventional till, can reduce the use of fuel by 50 to 70 %, machinery requirements by 60%, resulting in a decrease in production costs. Economic yields of cereals are better in direct seeding relatively to conventional till; in the worst case they are equal. In addition to these economic benefits, the observations recorded in fields show many other advantages such as environmental rehabilitation of the soil and the reduction of environmental pollution. These results are tools needed to convince farmers to adopt this technique and allow the use of fallow land, which represents nearly 50% of cultivated land.

Thus, a combination of the economic benefits of improved soil management through reduced labor requirements, time savings, reduced machinery and fuel savings with direct seeding, combined with the environmental benefits listed above has universal appeal. Indirect measures of social benefits as society enjoys a better quality of life from environmental quality enhancement will be difficult to quantify. Conservation agriculture, working in harmony with nature using direct seeding techniques which enables the protection of non-renewable natural resources and their preservation for future generations, can be beneficial for feeding and greening the world.

**Key words:** Socio-economic, environmental impact, conservation agriculture, global warming, soil management.