

Practicing Conservation Agriculture to mitigate and adapt to Climate Change in Jordan.

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Climate change scenarios indicate that Jordan and the Middle East could suffer from reduced agricultural productivity and water availability among other negative impacts. Based on the projection models for the area, average temperature in Jordan is projected to increase between 1.2 and 1.6 °C by 2050. Projections for precipitation trends are projected to decrease by 16% by the year 2050. Evaporation is likely to increase due to higher temperatures. This is likely to increase the incidence of drought potential since precipitation is projected to decrease.

The dominant form of agriculture system in Jordan is based on intensive tillage. This form of tillage has resulted in large losses of organic soil carbon, weaker soil structure, and cause compaction. It has negative effects on soil aeration, root development and water infiltration among other factors. There is a need to transform farming practices to conservation agriculture to sequester carbon so that climate change mitigation becomes an inherent property of future farming systems.

Conservation Agriculture, a system avoiding or minimizing soil disturbance, combined with soil cover and crop diversification, is considered to be a sustainable production system that can also sequester carbon unlike tillage agriculture. Conservation agriculture promotes minimal disturbance of the soil by tillage (zero tillage), balanced application of chemical inputs and careful management of residues and wastes.

This study was conducted to develop a clear understanding of the impacts and benefits of the two most common types of agriculture, traditional tillage agriculture and conservation agriculture with respect to their effects on land productivity and on soil carbon pools.

The study results indicated that conservation agriculture contributed to the reduction of the farming systems' greenhouse gas emissions and enhance its role as carbon sinks. Also, it was found that by shifting to conservation agriculture labor cost needed for land preparation through tillage systems decreased by 40-60% as a result of fuel and time-saving in the operations. The mean biological and grain yield by applying conservation agriculture have increased between 14-35% compared to conventional agriculture.

It is concluded that there is a correlation between CO₂ loss and tillage intensity and that a shift from traditional agriculture to Conservation agriculture can contribute to making agricultural systems more resilient to climate change.