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ZERO-TILLAGE BOOSTS RETURNS TO CEREALS IN MOROCCO

Initial results from the use of conservation agriculture practices in one region of Morocco show immediate reductions in cultivation costs, boosting farmer income, and spontaneous uptake of the practices by neighboring farmers

Conservation agriculture is aimed at reducing the effort and cost of farming in a way that protects and improves agricultural soils.



Planting seed into untilled soil dramatically reduces time and costs involved compared with conventional practices, and has many environmental benefits.

Source: "pictures from project managers"

Points to Consider

- The system depends on availability of specialist machinery, which may have to be imported initially
- Long-term sustainability and affordability depends on development of local manufacturing and support
- Demonstration and extension support are required to encourage farmers to test the system

Purpose

This brief describes preliminary trials with conservation agriculture with smallholder farmers in two regions in Morocco. It is aimed at policy-makers, donors, and other potential partners and supporters.

Suitability

Conservation agriculture is widely used around the world under a wide range of conditions. Its primary benefit to farmers is the reduction in costs resulting from reduction in tillage operations, and protection of the soil and soil structure. It also contributes to increasing soil fertility and maintaining soil moisture, especially in drier areas.

The project in numbers

- 500 hectares – area supported by the project
- 700 hectares – sown by neighboring farmers without assistance from the project

Partners

- Ministries of Agriculture and Marine Fisheries
- Institut National de Recherche Agronomique (INRA)
- Smallholder farmers (less than 5 hectares) in Rabat Salé Zemmour Zair (Roumani)

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A traditionally prepared field (left) and a zero-tilled field (right). Reducing cultivation improves soil structure, increases organic-matter content and water-holding capacity, and protects the soil from erosion.

Source: "pictures from project managers"

Minimizing the disturbance of the soil—no plowing or harrowing, no burning of stubble—reduces costs and time needed to prepare the land. Seed is planted directly into undisturbed soil, along with the fertilizer it needs. Leaving stubble and other crop residues from the past harvest on the soil surface and leaving the soil undisturbed protects farmland from wind and water erosion and from extremes of heat. It also increases infiltration of rainfall, reduces runoff, and reduces evaporation of water from the soil surface. The stubble and crop residues accumulate in the soil, increasing soil organic matter, improving the soil's structure. This boosts the soil's ability to hold water that is more available to plants.

The activity, under the Projet d'Intégration du Changement Climatique dans la mise oeuvre du Plan Maroc Vert, helped some 70 farmers in an area of Morocco identified as being particularly vulnerable to the effects of climate change (Rabat Salé Zemmour Zair) to change from their traditional, cultivation-intensive practices to zero-tillage conservation agriculture.

The project borrowed a specialized seed drill from INRAT and used it to plant some 500 hectares of cereals in the 2011/12 and 2012/13 cropping seasons.

Initial results indicate that yields achieved with direct drilling are similar to those achieved with the farmers' traditional practices but that costs are greatly reduced.

Local interest promises sustainability

Neighboring farmers who were not participants in the program have shown great interest in the zero-tillage approach being tested, and have

adopted the practice independently. In their initial efforts, they made use of the seed drills that they already owned, but have since developed modified drills based on locally available equipment and materials. They also adapted the system to crops other than cereals, including chickpea.

This bodes well for the spread and sustainability of conservation agriculture—the machines brought in from Brazil are much too expensive for smallholder farmers, even if they are organized into cooperatives, but locally manufactured alternatives would be cheaper and more sustainable. Trials with locally manufactured zero-till seed drills in Syria and Iraq have shown them to be as effective as costly imported equipment at a fraction of the price.

Until this local manufacturing base is established, the government will need to subsidize the cost of the machinery to encourage widespread uptake of the approach. Extension efforts will need to be directed to raising awareness of the benefits of conservation agriculture and encouraging more farmers to try the approach for themselves. Research will also be needed to investigate the possibility of integrating livestock into the conservation agriculture system, in particular to determine their impact on soil structure and fertility and moisture conservation.



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