

Conservation agriculture: Minimal Tillage and Surface Mulching of Soils



Later ripening and better grain filling of wheat due to water conservation in no-till system (middle)

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Conservation Agriculture for Sustainable Farming

Conservation agriculture (CA) includes minimal soil disturbance, surface residue retention, and crop rotation, proven effective in dryland wheat farming. It improves soil quality, water use efficiency, and yield stability, while reducing costs and energy. Additionally, CA enhances soil biodiversity, mitigates emissions, and sequesters carbon, benefiting both farmers and the environment.

This technology is **TAAT1 validated**. **8·7** Scaling readiness: idea maturity 8/9; level of use 7/9

Gender assessment **4**

Climate impact **7**

Problem

- Excessive tillage and limited organic matter degrade soil quality.
- Droughts, intense rains, and overuse limit water availability.
- Dryland farming yields are low and vulnerable to water scarcity.
- Agriculture contributes to emissions and affects carbon storage.
- Traditional tillage leads to weed competition and yield reduction.

Solution

- Minimal soil disturbance, surface residue retention, and crop rotation.
- Enhanced soil quality, water efficiency, and yield stability.
- Mitigates drought and heat stress on crops.
- Saves water and reduces herbicide usage.
- Manages soil nutrients and pests effectively.
- Suitable for various soil types and water conditions.
- Increases resilience to environmental stresses.

Key points to design your project

The Minimal Tillage and Surface Mulching of Soils technology boosts crop productivity and ensures food security by maintaining consistent yields while conserving water and soil health. This method reduces agriculture's environmental impact, aiding in poverty alleviation and promoting sustainable livelihoods for farmers. To integrate this technology, it is essential to raise awareness of its benefits, ensure equipment accessibility, implement incentives for agroecosystem services, establish connections with food industries for market access, allocate resources for training and ongoing support, collaborate with agricultural institutions, and explore integration with complementary technologies.

Cost: **\$\$\$ 740 USD/ha**

Three-year average total production under CA

15 - 22 % Increase in yield	18 - 21 % water use efficiency	20 % increase in income	923 USD/ha Increase in profit from wheat production	IP Open source / open access
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Technology from
ProPAS

Commodities
Wheat

Sustainable Development Goals

Categories

Production, Practices,
Pest control (excluding weeds),
Water management

Best used with

- [Yellow Rust and Stem Rust Resistant wheat >](#)
- [Hessian Fly Resistant Wheat Varieties >](#)

Tested/adopted in

Tested & adopted
 Adopted
 Tested

Where it can be used

This technology can be used in the colored agro-ecological zones.



Conservation agriculture

<https://e-catalogs.taatafrica.org/gov/technologies/conservation-agriculture-minimal-tillage-and-surface-mulching-of-soils>

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