Conservation agriculture: Minimal Tillage and Surface Mulching of Soils

Conservation Agriculture for Sustainable Farming

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

International Center for Agricultural Research in the Dry Areas (ICARDA)
Zewdie Bishaw

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

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

Three-year average total production under CA

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

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 business plan

- Technology boosts crop yields, ensuring food security and profitability for farmers.
- Minimizes soil disruption and conserves moisture, reducing water and fertilizer needs.
- Prevents erosion and chemical runoff, promoting environmental sustainability.
- Lowers input costs and increases resilience to climate variability, benefiting farmers economically and environmentally.
- Accessible through agricultural extension services, research institutions, and local farming communities.
- Integration with complementary approaches, such as heat and drought-tolerant wheat varieties, is recommended for optimal results.

Gender assessment 4

Climate impact 7

Technology from

ProPAS

Commodities

Wheat

Sustainable Development Goals

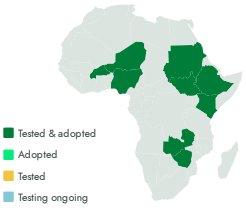
Categories

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



Where it can be used

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