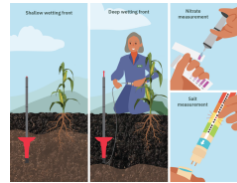


Soil Moisture Monitoring: Wetting Front Detector

Wetting Front Detector

The Wetting Front Detector is a simple mechanical tool buried in the soil root zone to detect how deep irrigation or rainwater has infiltrated. When the wetting front—the boundary between wet and dry soil—reaches the device, water collects in a funnel, activating a float that raises an indicator flag above the soil surface. This shows that the soil at that depth is saturated, signaling when to stop irrigation. The device requires no electronics or power and also collects a small water sample for testing soil salinity or nutrient levels.



International Water Management Institute
Adebayo Oke

Commodities

Vegetable crop

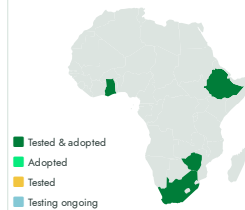
Sustainable Development Goals



Categories

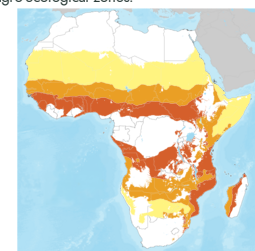
Pre-production, Practices,
Water management

Tested/adopted in



Where it can be used

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



Target groups

Farmers

Warning: This technology is not yet validated.

Scaling readiness: idea maturity 8/9; level of use unknown

Inclusion assessment



Climate impact



Problem

- **Over-irrigation:** Avoids excess water use and waterlogging.
- **Under-irrigation:** Detects insufficient watering that reduces yields.
- **Invisible soil moisture:** Makes root zone water movement visible.
- **Nutrient and salt monitoring:** Enables soil water sampling to manage fertilizer and salinity.
- **Uneven irrigation:** Identifies soil moisture variability for uniform application.
- **Inefficient water use:** Improves irrigation scheduling to save water, energy, and labor.

Solution

- **Visual guidance:** Shows when the root zone is fully watered.
- **Ease of use:** No power or electronics required.
- **Accurate timing:** Indicates when to stop irrigation.
- **Soil water sampling:** Enables nutrient and salt testing.
- **Versatile:** Works with drip, sprinkler, and furrow irrigation.
- **Resource savings:** Reduces water and energy use.
- **Learning tool:** Gives farmers immediate feedback to improve practices.

Key points to design your project

- Simple, power-free device that shows how deep water penetrates in soil to guide irrigation.
- Suitable for drip, sprinkler, and furrow irrigation systems.
- Costs about USD 36 per box containing two pairs of detectors.
- Installation depth varies by irrigation type (15-50 cm range).
- Requires proper installation, training for farmers, and communication support.
- Collaboration with local agricultural institutes and agro-dealers recommended.
- Supports sustainable, efficient, and climate-smart agricultural water management.

16 - 44 %

Range of water savings



Open source / open access



Soil Moisture Monitoring

<https://taat.africa/xca>

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