

# Effects of tillage on runoff from a bare clayey soil on a semi-arid ecotope in the Limpopo Province of South Africa

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## **Abstract**

Runoff constitutes one of the major water losses from agricultural fields in semi-arid areas. However, by adopting appropriate soil management practices, the runoff can be harnessed for improving crop yields. The main objective of this study was to quantify rainfall-runoff relationships under in-field rainwater harvesting (IRWH) using simulated rainfall, and to compare these results to those obtained with annually tilled conventional tillage (CON) (control). IRWH is a special type of no-till (NT) crop production practice that promotes runoff from a crusted runoff strip into basins where the water infiltrates beyond evaporation but is available for crop use. Runoff was related to time to runoff, total runoff, final runoff rate and runoff coefficient. This experiment demonstrated that by adopting IRWH production technique smallholder farmers could harness an additional  $45.54 \text{ m}^3 \cdot \text{ha}^{-1}$  of water compared to the CON system. The extra water harvested could meet about 1% of maize water requirements.

**Keywords:** Limpopo Province; no-tillage; runoff; rainfall simulation; rainwater harvesting