

## **Abstract**

Soil water conservation through tillage is widely accepted as one of the appropriate ways of addressing soil moisture constraints in rainfed agriculture. A field experiment was conducted for 6 seasons (2007 to 2009) to evaluate the effects of 3 tillage practices namely ox-plough (OP), subsoiling-ripping (SR) and tied-ridge (TR) on soil physical and hydro-physical properties of a sandy loam soil. Soil surface roughness, bulk density (BD), total porosity, crust strength, saturated hydraulic conductivity, steady infiltration rates and soil water storage were evaluated. Results showed that, mean inter-row BD ( $1.51 \text{ Mg m}^{-3}$ ) and crust strength ( $3.05 \text{ MPa}$ ) with SR tillage were 7 and 15% greater ( $P \leq 0.05$ ) than with OP, respectively. Inter-row infiltration rates for OP ( $7.9 \text{ cm h}^{-1}$ ) were more than two fold greater than for SR ( $3.6 \text{ cm h}^{-1}$ ) and TR ( $3.3 \text{ cm h}^{-1}$ ). Soil surface roughness with TR was significantly greater than with OP and SR tillage systems. Soil water storage for TR ( $222 \text{ mm}$ ) exceeded ( $P \leq 0.05$ ) that for OP and SR by  $30 \text{ mm}$  (16%) and  $32 \text{ mm}$  (17%), respectively. This study concluded that, ripping soil along planting line that are prone to surface crusting without disturbing the soil between crop rows was not effective as a conservation tillage method.