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Response of Sunflower to Rainwater Conservation and Nutrient Management in Semi-arid Conditions

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Abstract: Sunflower is an important oilseed crop grown throughout the year due to its short duration, day neutral, low photoperiod sensitivity and wider adoptability to agroclimatic conditions and soil types in Asian countries. Lower yields of sunflower in rainfed vertisols are attributed to lower soil moisture and nutrients availability. In this situation, we conducted field studies at research farm and farmers' fields to know the response of sunflower to rainwater conservation and nutrient management in vertisols of India. Compartmental bunding and ridges and furrows conserved more rainwater in profile, thus producing greater sunflower seed yields varying from 22% to 28% compared to farmers' practice of flat-bed sowing. Greater seed yield with resource conservation is attributed to higher head diameter with greater head weight and seed weight per plant over flat-bed sowing. Nutrient management as farmers practice INM_1 (15 kg N ha^{-1} + 15 kg P_2O_5 ha^{-1} + 1.0 t farmyard manure ha^{-1}) with *Azospirillum* seed treatment (INM_2) produced 5–6% higher seed yield, whereas recommended rate of nutrients (40 kg N ha^{-1} + 40 kg P_2O_5 ha^{-1} + 2.0 t farmyard manure ha^{-1}) with *Azospirillum* seed treatment (INM_3) produced 13–16% greater seed yield both at research farm and farmers' fields over INM_1.

Keywords: *Azospirillum*, nutrient management, rainwater conservation, sunflower, vertisols