

عنوان مقاله:

Land surface modification and crop diversification for enhancing productivity of a Vertisol

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خلاصه مقاله:

Vertisols occur extensively in central India and have high production potentials. Because of the high clay content (40-60% or more), high bulk density (1.5-1.8 Mg m⁻³) and related properties, these soils have high moisture storage capacity. Conversely, these soils become very hard when dry and very sticky when wet. Since last two decades, scientists, farmers and also the policy makers have been striving to manage these soils through harnessing the beneficial attributes as well as overcoming the production constraints. Some of the potential options are efficient surface land configuration and crop diversification. Field experiments were conducted at the Research Farm at Bhopal to evaluate the land surface configuration and crop diversification. Results of our experiment on vertisols showed a considerable reduction in run off of water and also soil loss from broadbed and furrow (BBF) compared to flat-on-grade (FOG) during rainy season and at the same time crop productivity was significantly improved in BBF. It enhanced yield of soybean (*Glycine max* (L.) Merr.), maize (*Zea mays* L.), pigeonpea (*Cajanus cajan* (L.) Millsp.) as sole and as well as intercropping and sole chickpea (*Cicer arietinum* L.) by about 12.7-20.0% over FOG. The yield of crops (soybean, maize and pigeonpea), expressed as soybean equivalent yield, was compared and it showed an improvement in yield from different intercropping systems on BBF. The residual effect of rainy season crops on succeeding chickpea was not significant; however, its yield in two irrigation (one pre-sowing plus one post-sowing) was significantly greater than pre-sowing irrigation only in both land configurations. Water use efficiency (WUE) of chickpea was more under BBF than FOG. The study elucidates the constraints and potentials of vertisol for crop production especially with reference to central India and effective ways to improve crop productivity through land surface modification and crop diversification.

کلمات کلیدی:

Vertisols, Crop production, Broad-bed and furrow, Soybean-based system

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