Soil Water use and Grain Yield of Three Dryland Crops under Differing Tillage Systems. (S06-moroke131231-Poster)

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Abstract:

Combining the use of drought-adapted and early maturing crops with reduced tillage practices in dryland cropping systems can increase soil water storage, water-use efficiency and crop yields. The objective of this study was to evaluate soil water use by cowpeas (Vigna unguiculata (L.) Walp.), grain sorghum (Sorghum bicolor (L.) Moench), and sunflower (Helianthus annuus L.) under no tillage and stubble-mulch tillage systems. Water contents to a depth of 2.3 m were measured by neutron scattering to estimate weekly soil water use in 2000 and 2001. No tillage significantly increased soil water stored by 8% at planting ($P<0.05$) in 2000 compared to stubble-mulch tillage. Sorghum and sunflower extracted soil water at deeper depths than cowpea. Average seasonal water use by cowpea (132 mm) was significantly ($P<0.05$) less than water use by sorghum (227 mm) and sunflower (230 mm). Sorghum had significantly higher water use efficiency than cowpeas and sunflower ($P<0.05$). The use of early maturing and alternative crops such as cowpeas allows for flexible crop rotations that may increase the amount of stored water available for subsequent crops and reduce the length of fallow periods

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