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*Footprints in the Landscape: Sustainability through Plant and Soil Sciences*

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**Tillage and Grazing Effects On Yields of a Dryland Wheat-Sorghum-Fallow Rotation.**

*Tuesday, November 3, 2009  
Convention Center, Exhibit Hall BC, Second Floor*

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Declining irrigation well capacity in the U.S. Southern High Plains has increased reliance on less productive and inherently riskier dryland cropping systems. No- and stubblemulch- tillage (SM) stabilize production of wheat (*Triticum aestivum* L.) and grain sorghum [*Sorghum bicolor* (L.) Moench] grown using a 3-year wheat-sorghum-fallow (WSF) rotation, but grazing has the potential to intensify the WSF rotation. Soil compaction due to cattle movement may develop with grazing under No- or SM- tillage. Our objectives were to quantify the effects of tillage method and cattle grazing on the growth and yield of wheat and the subsequent sorghum crops. Beginning in 1999 on a gently sloping Pullman silty clay loam (fine, mixed, superactive, thermic Torric Paleustoll) at the USDA-ARS, Conservation and Production Research Laboratory, Bushland, TX, we established all WSF rotation phases in triplicate ungrazed and grazed paddocks. During 2004, No- or SM- tillage sub-plots were superimposed over the grazing treatments. Dryland grain yields of wheat and sorghum were unaffected by grazing in SM tillage plots, although grazing reduced wheat straw yield. Wheat grain and straw yields decreased on grazed No-till plots, probably because of sustained soil compaction effects and biomass removal. However, No-till grain yield of the subsequent sorghum crop planted 11-months later was unaffected by grazing probably because wetting-drying and freeze-thaw cycles loosened the soil. Also, the overall increase in fallow precipitation stored as soil water with No- compared with SM- tillage resulted in increased sorghum grain yield. For SM-tillage, overall productivity of the WSF cropping system was increased by limited grazing of dryland wheat forage and sorghum stover with no significant reduction in wheat or sorghum grain yields compared with ungrazed plots.

See more of: [Management of Dryland Soils and Cropping Systems: II](#)

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