

Title: Managing Grazing to Restore Soil Health and Farm Livelihoods

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Abstract (200-500 words)

To ensure long-term sustainability and ecological resilience of agro-ecosystems, agricultural production should be guided by policies to ensure regenerative cropping and grazing management protocols. Changing current unsustainable high-input agricultural practices to low-input practices that regenerate ecosystem function will be necessary for sustainable, resilient agro-ecosystems. Effective soil management provides the greatest potential for achieving sustainable use of agricultural land with rapidly changing, uncertain and variable climate. With appropriate management of grazing enterprises, soil function can be regenerated to improve essential ecosystem services and farm profitability. Affected ecosystem services include carbon sequestration, water infiltration, soil fertility, nutrient cycling, soil formation, biodiversity, wildlife habitat, and increased ecosystem stability and resilience. Collectively, conservation agriculture managed regeneratively supports ecologically healthy, resilient agro-ecosystems and enhances watershed function. To accomplish this, it is important for scientists to partner with farmers who have improved the environment and excel financially to convert experimental results into sound environmental, social and economic benefits regionally and globally. Benefits include: addressing questions at commercial scale; integrating component science into whole-system responses; identifying emergent properties and unintended consequences; incorporating pro-active management to achieve desired goals under changing circumstances; and including the potential of the human element to achieve superior economic and environmental goals. Developing and implementing regenerative management protocols that include ruminant grazing animals will be necessary to ensure long-term sustainability and ecological resilience of agro-ecosystems.

Recent Publications (3 to 5)

1. Teague WR. 2018. Managing grazing to restore soil health and farm livelihoods. Journal of Animal Science 96:1519–1530.
2. Teague WR and Barnes M. 2017. Grazing management that regenerates ecosystem function and grazingland Livelihoods. African Journal of Range & Forage Science, 34: 77–86.
3. Park J, Srinivasulu A, Teague WR, Jeong J. 2017. Evaluating the ranch and watershed scale impacts of using traditional and adaptive multi-paddock grazing on runoff, sediment and nutrient losses in North Texas, USA. Agriculture, Ecosystems and Environment 240: 32-44.
4. Teague WR, Apfelbaum S, Lal R, Kreuter UP, Rowntree J, Davies CA, Conser R, Rasmussen M, Hatfield J, Wang T, Wang F, Byck P. 2016. The role of ruminants in reducing agriculture's carbon footprint in North America. Journal of Soil and Water Conservation. 71:156-164.
5. Wang T, Teague WR, Park SC, Bevers S. 2015. GHG mitigation potential of different grazing strategies in the United States Southern Great Plains. Sustainability 7:13500-13521.

Biography (100-200 words)

Richard Teague is Professor in the Department of Ecosystem Science and Management at Texas A&M University. The purpose of his research is to conduct a ranch-scale, multi-county assessment that addresses

objectives in the context of improving Soil Health and ecosystem services in grazing ecosystems as the foundation to improving ranch-based livelihoods and as they relate to Climate Change Mitigation and Adaptation. This involves determining: 1) the extent that grazing strategies influence key ecosystem services of soil and vegetation carbon sequestration, soil fertility and stability, water quality, net primary and secondary production, and the economic viability of working ranches that contribute to the retention of open space and rural community health in the Southern Plains of the USA; and 2) the extent that different grazing management strategies can be used by livestock producers to mitigate and adapt to alternative climate change scenarios.

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Notes/Comments: