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RESEARCH

USDA grant focuses on beef cattle production

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The Noble Foundation recently partnered with Oklahoma State University, The University of Oklahoma, Kansas State University, Tarleton State University and the United States Department of Agriculture (USDA)-Agricultural Research Service to undertake a major beef cattle research project. The project, entitled "Resilience and Vulnerability of Beef Cattle Production in the Southern Great Plains Under Changing Climate, Land Use and Markets," is a Coordinated Agricultural Program established through the USDA's Regional Approaches to Climate Change program. The project was one of only two funded during the 2012 USDA-Agricultural and Food Research Initiative grant competition.

The study area for this project ranges from north-central Texas through central Oklahoma and into south-central Kansas. Beef produced in this region provides a significant portion of the nation's red meat while contributing greatly to farm income in the region. Land use in the region is a mosaic that provides abundant ecosystem services, including nutrient cycling, water filtration and habitat for numerous at-risk avian, terrestrial and aquatic species. Cow-calf operations, which utilize native prairie for year-round grazing and introduced perennial grasses for summer grazing, and beef stocker operations, which rely mainly on winter wheat for grazing, are the focus of the study.

The purpose of the study is to better understand the region's current status and our ability to mitigate and adapt to the effects of climate variability. This improved understanding is essential because these lands are so significant to both agricultural and environmental sustainability. The region is blanketed by a variety of land uses that support one of the most productive forage-based beef cattle production systems in the U.S. A number of resource concerns are of interest across this region, including soil degradation, wind and water erosion, sedimentation, loss of nutrients from agriculture to the environment, air quality impacts of fire, vulnerability to climate variability and change, reduced productivity, and encroachment of woody plants, to name a few.

The long-term goal of the project is twofold: 1) to better understand vulnerabilities and enhance resilience

of Southern Great Plains beef grazing systems, given the climate variability, dynamic land use and market fluctuations in the region, through the introduction of diversified forages, better management, multiple marketing options, strategic drought planning and improved decision support systems for evaluating alternatives; and 2) to safeguard and strengthen production and delivery of ecosystem services while mitigating greenhouse gas emissions in the Southern Great Plains.

Anticipated outcomes from this project include a coordinated, functional network capable of developing and delivering science-based knowledge that addresses climate adaptation and mitigation, informs policy development, and supports on-farm decision-making in forage-based beef production systems and consumer choice for environmentally friendly beef. A team of scientists, made-up of representatives from each institution, will quantify greenhouse gas emissions in each phase of the forage-based beef production systems, assess environmental footprints, and address questions about potential impacts of climate variability and change on system vulnerability and resilience.

The findings will inform outreach and extension programs that build on the broad foundation of knowledge that is drawn upon to influence farm and ranch management decisions to mitigate and adapt to a variable climate. Noble Foundation consultants and a varied group of extension specialists from across the region will provide insight as to what practices are being used today and will deliver knowledge already available and new knowledge learned through scientific efforts that will focus on climate change and variability in this important production system. ■