

## Patch burning-grazing study at Konza Prairie may benefit ranchers

MANHATTAN — Although the majority of the grasslands in Kansas are managed for livestock production and have been evenly grazed for generations, new research by Kansas State University may give rise to an alternate land management practice that could provide ecological benefits and lead to additional income sources for ranchers.

Konza Prairie Biological Station, which is jointly owned by K-State and The Nature Conservancy and managed by K-State's Division of Biology, has begun research on the effects of patch burning and cattle grazing on tallgrass prairie ecology in cooperation with K-State's animal sciences and industry department.



"The big looming question is whether altered grazing patterns that increase heterogeneity and enhance wildlife are compatible with animal production goals and profits," said John Briggs, director of Konza Prairie Biological Station.

The idea behind initiating a patch burn project at Konza Prairie has been spearheaded by Anthony Joern, university distinguish professor in herbivore ecology, and Gene Towne, Konza fire chief and bison manager. They decided that land-managers and producers in the Flint Hills would both benefit from a study where cow/calf performance and ecological performance were measured simultaneously. The study is being done in collaboration with the animal sciences and industry department.

"The new patch-burn study is a chance to take the ecological research we do at Konza Prairie and extend it to the greater Flint Hills where they are managing cattle -- not bison," Joern said.

The study is comprised of two units on Konza Prairie that line the west side of Kansas Highway 177. The south unit consists of 452 acres and is stocked with 56 cow calf pairs, with 27 pairs on the smaller adjacent control plot. The replicating north unit, which will be stocked in spring 2011, will have a comparable 100 pairs on 829 acres. It also will have a control plot.

Each unit has been divided into three sections. Cattle will be allowed to roam the entire unit. But only one-third of the unit will be burned each year on a rotating basis, which should naturally persuade cattle to graze most often on the section that has been burned most recently. This should allow the other two sections to diversify, providing ground-cover habitat for upland birds and other wildlife, Towne said.

"The key to successful patch burning and grazing is to allow the unburned areas to recover from the more intensive grazing that is expected in the burned area," Towne said. "It's going to take a couple of burning and grazing cycles to see if rangeland quality is going downhill or whether it's actually maintaining itself."

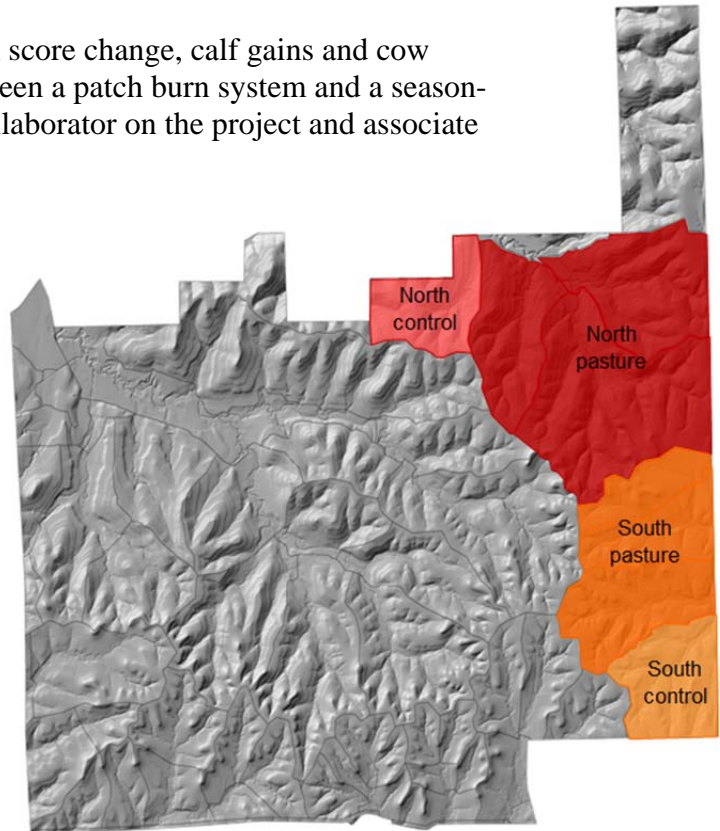
Since the patch burn project will need at least two or three three-year cycles to accurately assess the long-term effects on both animal and ecological performance, the aesthetic appeal of the prairie in the early years of the study may appear patchy, Towne said. However, the period of rest from grazing that the burning rotation provides will allow the prairie that's not burned in a given year to restore itself, triggering many ecological benefits including critical habitat for wildlife, he said.

The research project will involve work by many K-State scientists from several disciplines to monitor changes in a variety of responses such as plant species composition, residual biomass, wildlife populations, water quality, soil nutrients and cattle performance, including weight gain and body condition.

"I expect cow weight change, cow body condition score change, calf gains and cow reproductive performance will be equivalent between a patch burn system and a season-long annually burned system," said KC Olson, collaborator on the project and associate professor of animal sciences and industry.

There may be additional strong economic motivators for implementing a patch burn system, Olson said. Improved wildlife habitat, fewer acres burned per year and predictable grazing distribution may save time, labor and reduce costs for ranchers when checking or gathering cattle. Things like ecotourism, fee hunting and future markets in carbon credits may provide further income.

"K-State has been a leader in the area of grazing management for a long time," Olson said. "We try to help Kansas ranchers and farmers find more profitable, more sustainable ways to do things. We're ready to go to the next level. Patch burning holds great promise for Kansas."



Olson said that even on a well-run operation, the capital investment associated with ranching is so large that return on investment is usually very modest. One way to improve returns on land investment is to develop income streams that complement a livestock enterprise. Many ranchers can attest to the fact that being a responsible steward of both their livestock and environmental resources is beneficial both economically and morally, he said.

"I think one of the most important things that may come out of this research endeavor is a demonstration that when resource stewardship is the top priority in a grazing livestock operation, it will pull profitability behind it," Olson said.

Konza Prairie Biological Station and the Konza Long-Term Ecological Research program, funded by the National Science Foundation, are co-sponsoring the patch burn project.

"Most of the Flint Hills is grazed by cattle so if we are going to conserve the tallgrass prairie it has to involve cattle management," Briggs said. "We need information that will serve the ranching industry and contribute to the conservation aspect of the Konza mission."