HIGHLIGHTS

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An Alternative Rangeland Management Strategy in an Agro-Pastoral Area in Western China

Limin Hua, Siwei Yang, Victor Roy Squires, and Guizheng Wang

Rangeland degradation in agro-pastoral regions is more severe than that in pastoral regions in China because of differences in land tenure and use rights. We compared the effects of three rangeland management strategies on degradation of agro-pastoral rangeland in northwest China. The Allied Householders Contract Responsibility System (AHCRC) worked better than “protecting rangeland by restricting grazing” and “free grazing on common areas.” AHCRC can solve the overgrazing problem, maintain or improve household income, and has the potential to ensure long-term sustainable rangeland management in agro-pastoral areas in northwest China.

A Survey-Based Assessment of Cattle Producers' Adaptation to Climate Change in British Columbia, Canada

Jauchlan H. Fraser, Mercedes Cox, and Wendy C. Gardner

About 60% of ranchers responding to a mail survey believe climate change is a reality and they are adapting their management in response to climate change. We found that 1) ranchers newer to the business were more likely to believe that climate change is caused by human activity, 2) ranchers from the most northerly region were most likely to acknowledge climate change, and 3) adaptive management for forage supply and water availability were the most common responses to climate change. Experiential and scientific knowledge will be crucial to future planning to reduce the vulnerability of the ranching industry to climate change and to building adaptive capacity.

Generation of Ecosystem Hotspots Using Short-Term Cattle Corrals in an African Savanna

Lauren Porensky and Keri Veblen

In sub-Saharan Africa, temporary thorn-fence corrals (“bomas”) are used to protect livestock at night, and after months or years of use, abandoned boma sites develop into long-term ecosystem hotspots with high forage quality and diverse, abundant wildlife. We evaluated the effects of short-term, metal-fenced “mobile bomas” to see if they also would develop into ecosystem hotspots. Soil nutrients, forage quality, wildlife use, and cattle use were all higher at abandoned mobile boma sites than at paired reference sites. By concentrating livestock during the night in short-term corrals, managers can create hotspots that attract wildlife and provide palatable forage for livestock.

Genetic Influences on Cattle Grazing Distribution: Association of Genetic Markers with Terrain Use in Cattle

Derek W. Bailey, Steven Lunt, Adrienne Lipka, Milt G. Thomas, Juan F. Medrano, Angela Cánovas Gonzalo Rincon, Mitch B. Stephenson, and Delyn Jensen

Selection is a potential tool to improve cattle grazing distribution, but the importance of genetics on this trait must be determined. The association of genetic markers and terrain use was evaluated on cattle grazing extensive or mountainous pastures. Multiple genetic markers were associated with terrain use, which demonstrates that cattle grazing distribution can be inherited and should respond to genetic selection. Potentially, genetically superior (and inferior) bulls and replacement females could be identified from relatively inexpensive DNA tests and used in cattle breeding programs as a novel approach to improve grazing distribution without capital expenditures such as water developments.

Time of Grazing Effect on Subsequent-Year Standing Crop in the Eastern Nebraska Sandhills

Mitchell B. Stephenson, Walter H. Schacht,
Jerry D. Volesky, Kent M. Eskridge, and Dennis Bauer

Time of grazing is one of the main principles of proper grazing management. We studied the effect of time of grazing during the growing season on subsequent-year standing crop of plant functional groups at different topographic positions in the Nebraska Sandhills from 2001 to 2008. Grazing early in the growing season tended to produce greater amounts of subsequent-year warm-season grass standing crop than grazing during the mid-portion of the growing season at specific topographic positions. Annually rotating pastures within a deferred rotation appears to be an excellent grazing method to avoid directional vegetation changes on these rangelands.

Long-Term Forage, Cow-calf, and Economic Performance of Two Stocking Levels on Chihuahuan Desert Rangeland

Milt Thomas, Ahmed Mohamed,
Mohammed Sawalhah, Jerry Holechek, Derek Bailey,
Jerry Hawkes, and Pablo Luna-Nevarez

Livestock stocking rate decisions for Chihuahuan Desert rangelands are challenging. Fifteen years of study of light (27%) and conservative (39%) grazing use with Brangus cattle suggested that conservative stocking may provide higher financial returns than light stocking during nondrought years as there were more cows per pasture. However, risk for herd liquidation during annual droughts could nullify this advantage and provide an economic advantage for light grazing use. Light stocking also appeared to be more beneficial for rangeland recovery after extended drought. Managers must balance stocking rate with risk for partial or whole-herd liquidation in desert beef production systems.

Avian Habitat Following Grazing of Native Warm-Season Forages in the Mid-South USA

Jessie Lee Birkhead, Craig A. Harper,
Patrick D. Keyser, John C. Waller, Matt Backus,
Gary E. Bates, Elizabeth D. Holcomb,
and Jarred Brooke

Native warm-season grasses are recommended by federal and state agencies for livestock grazing in the mid-southern United States, but little is known about their contribution to wildlife habitat. We evaluated the effect of intensive early-season grazing and moderate season-long grazing in native grass pastures on habitat for grassland songbirds and northern bobwhite at three sites across Tennessee, 2010 and 2011. Continuous grazing that maintained grass height around 16 inches provided adequate cover for nesting and brood-rearing songbirds and bobwhite throughout summer. However, intensive early-season grazing left the habitat undesirable for

several avian species in mid-summer. Moderate season-long grazing of native grasses in the mid-south may be the best strategy for livestock producers who are interested in maintaining wildlife habitat.

Monitoring the Impact of Grazing on Rangeland Conservation Easements Using MODIS Vegetation Indices

Miriam Tsalyuk, Maggi Kelly, Kevin Koy,
Wayne M. Getz, and H. Scott Butterfield

Residual dry matter (RDM), the dry-grass biomass left on the ground at the end of the grazing season, is a widely used proxy for rangeland condition. We developed a method for efficient monitoring of RDM, using time series of three Moderate Resolution Imaging Spectroradiometer (MODIS) satellite-based vegetation indices (VIs). We found a significant correlation between RDM and the VIs, especially the Leaf Area Index, which predicts compliance with RDM conservation easement terms. Our rangeland management model uses time series of MODIS VIs to predict forage quantities, manage stocking rates, and monitor rangeland easement compliance, efficiently, rapidly, and reliably.

Weather Constrains the Influence of Fire and Grazing on Nesting Greater Prairie-Chickens

Torre Jame Hovick, R. Dwayne, J. Elmore,
Samuel Fuhlendorf, and David Dahlgren

Greater prairie-chicken (*Tympanuchus cupido*) populations have rapidly declined throughout the Flint Hills regions of Kansas and Oklahoma over the past 2 decades. Fire and grazing may alter grassland structural heterogeneity and affect prairie-chicken nesting success. Prairie-chicken nests were located in the oldest burn sites, with minimal tree cover and close to lekking sites. Nest survival was most affected by solar radiation and somewhat by vegetation height more so than other management actions. Managing for structural heterogeneity can improve nesting conditions for Greater prairie-chickens, which may allow for increased survival when weather conditions are favorable.

Honey Mesquite (*Prosopis Glandulosa*) Seedling Responses to Seasonal Timing of Fire and Fireline Intensity

R. James Ansley, Betty A. Kramp, and David L. Jones

Many woody species that have invaded grassland and savanna ecosystems worldwide are fire resistant because they resprout following fire; however, seedlings may be vulnerable to fire. We quantified the effects of seasonal fires and fireline intensity on honey mesquite (*Prosopis glandulosa*) seedling mortality. Winter fireline intensity increased seedling mortality, yet summer fires caused much greater seedling mortality

than winter fires at lower grass fuel amounts (1,350–2,050 lb/acre). Timing of fire after seedling emergence, fireline intensity, grass fuel loads, and fire season (summer vs. winter) were all important factors in killing mesquite seedlings.

Management Regime and Seeding Rate Modify Seedling Establishment of *Leymus chinensis*

Guixia Liu, Feng He, LiQiang Wan, and XiangLin Li

Management options, including presow harrowing, postsow cutting, nitrogen fertilization, and seeding rate may influence the establishment of *Leymus chinensis* seedlings following broadcast seeding. We studied the effects of these management options on seedling emergence, survival, and growth on a degraded short-grass steppe site in Hebei Province, China. Broadcast seeding of *L. chinensis* after harrowing resulted in the highest seedling emergence (16.4%), seedling survival (62.5%), and plant height (3.5 inches) compared with other management options. Harrowing can be used for large-scale rehabilitation of *L. chinensis* grasslands and other water-limited degraded grassland ecosystems with compacted soil surfaces to promote seedling establishment.

Abundances of Coplanted Native Bunchgrasses and Crested Wheatgrass after 13 Years

Aleta M. Nafus, Tony J. Svejcar, David C. Ganskopp, and Kirk W. Davies

We examined the abundance of crested wheatgrass (*Agropyron cristatum*) and seven native sagebrush steppe bunchgrasses that had been planted concurrently at equal densities in nongrazed and unburned plots. Thirteen years postestablishment, crested wheatgrass was the dominant bunchgrass, with a 10-fold increase in density. Idaho fescue (*Festuca idahoensis*), Thurber's needlegrass (*Achnatherum thurberianum*), basin wildrye (*Leymus cinereus*), and Sandberg bluegrass (*Poa secunda*) maintained their original planting density, whereas bluebunch wheatgrass (*Pseudoroegneria spicata*), needle-and-thread (*Hesperostipa comata*), and bottlebrush squirreltail (*Elymus elymoides*) declined. Densities of native bunchgrasses planted with crested wheatgrass are unlikely to increase and some species may only persist at low levels.

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