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Center for Grassland Studies

E-mail: grassland@unl.edu
www.grassland.unl.edu

Phone: (402) 472-4101
Fax: (402) 472-4104

Volume 10, No. 2

Spring 2004

CGS Coordinates New Professional Golf Management Program

The newest major in the UNL College of Agricultural Sciences and Natural Resources (CASNR) is the second multi-disciplinary major administered by the Center for Grassland Studies: Professional Golf Management (the first was the Grazing Livestock Systems major).

UNL becomes just the 15th university nationwide to offer a Professional Golf Management (PGM) program accredited by the Professional Golfers' Association of America (PGA). The first cohort of PGM students at UNL will begin this fall.

PGA/PGM™ University Programs provide aspiring PGA Professionals the opportunity to acquire the knowledge and skills necessary for success in the golf industry through extensive classroom studies, internship experience and player development.

At UNL the program is a collaborative effort of three colleges: CASNR (the originating college and administrative home of the program), College of Business Administration, and College of Education and Human Sciences. The PGM program builds on excellent national reputations of programs in all three colleges: turf science, business, and nutrition and health sciences. Students will take courses in the physical sciences (biology, chemistry, physics, soil and plant sciences), business (management, accounting, finance, marketing, human resources) and hospitality management (menu planning, food safety, preparation and service).

While taking academic courses, students will simultaneously work on their skills and knowledge of the game of golf using PGA materials and attending seminars. As part of the player development component, students will also

participate in the PGM student club, play in golf tournaments run by that club, and practice golf club design and repair in a new lab constructed for this purpose on the UNL East Campus.

Additional requirements for all PGA/PGM™ University Programs include completing 16-20 months of approved full-time internships at golf facilities, passing the PGA's Playing Ability Test, and passing all three checkpoint tests administered on campus by PGA personnel. PGM graduates need only complete four to eight more months of qualified employment before applying to become a PGA member. Careers for PGM graduates include positions in golf facility management, golf instruction/education,

merchandising golf-related equipment and supplies, and working with golf associations and related areas.

We are pleased to announce that Wilderness Ridge Golf Course has an agreement with UNL to be the primary PGM course. Personnel at this excellent facility in south Lincoln are committed to helping our students through player development, serving as a model golf shop, and providing special fee-based access to its course, practice, and club repair facilities. Other PGM partner courses are Hillcrest Country Club and Yankee Hill Country Club. Another non-course partner is the Nebraska Section of the PGA, which also helped with the accreditation process and will continue to assist the program in a variety of ways, including promotion.

More information is available online at pgm.unl.edu, or by contacting the Center for Grassland Studies.



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The Center for Grassland Studies is a unit within the University of Nebraska-Lincoln Institute of Agriculture and Natural Resources. It receives guidance from a Policy Advisory Committee and a 50-member Citizens Advisory Council. This newsletter is published quarterly.

Note: Opinions expressed in this newsletter are those of the authors and do not necessarily represent the policy of the Center for Grassland Studies, the Institute of Agriculture and Natural Resources or the University of Nebraska.

Martin A. Massengale CGS Director
Pam Murray CGS Coordinator
Jan Shamburg CGS Secretary
Anne Moore Newsletter Layout



FROM THE DIRECTOR

Land-grant universities and their Colleges of Agriculture are challenged to find new and exciting majors to keep their student enrollment growing. There are not enough young people with farm and ranch backgrounds today to provide sufficient student numbers to fuel the growth. Therefore, areas of study need to be initiated to interest students with an urban or suburban background. Many of these new programs will fall into multi-disciplinary areas.

Centers, such as the Center for Grassland Studies, provide an ideal administrative setting for such majors. They are a place for faculty to meet, discuss ideas, and collaborate on subject matter topics that are new or emerging and deserve further exploration. Moving across departmental structures within the university encourages a new level of interaction that is often not available within a single discipline or department. Centers can be "neutral ground" for faculty to generate new approaches to multi-disciplinary education.

It is highly rewarding to experience faculty joining together from numerous and diverse backgrounds to discuss or investigate new project areas. These faculty have a common interest in better serving the university, the students and other constituents. It is incumbent on us as university administrators to recognize and reward those faculty members for their willingness to engage in these kinds of activities.

One of the newest undergraduate majors at the University of Nebraska-Lincoln is a classic example of just this kind of effort. Departmental faculty from three colleges have been involved in the initiation and operation of the Professional Golf Management (PGM) program (see related article in this issue). The development of this major would have been more challenging without the Center being available for the faculty to gather and work in a neutral environment.

The PGM major at UNL is the only program of its kind in the central midwestern or Great Plains states. With the growth of the golf industry and the widespread interest on the part of young people, this major offers a great opportunity for significant growth in student enrollment in UNL's College of Agricultural Sciences and Natural Resources.

Meeting societal needs will increasingly require more complex problem solving; therefore, professionals with knowledge in several disciplines will be necessary. In the case of this program, the PGA, in its accreditation criteria, states that it is looking for individuals trained in the areas of *business, people* and *game* of golf. PGM graduates from UNL will have a well-rounded background, a diverse set of academic courses that includes the physical, biological and social sciences, business, and liberal arts, and extensive internship experience. Thus, there are many career opportunities for these students, not only in the area of golf management, but in other related professional fields.

Today, we live and work in a constantly changing society, and we as educators need to help train those who will be responsible for owning and/or operating tomorrow's businesses. We, in universities, must be alert to those changes and be prepared to meet new needs. This is another example of a land-grant university serving the needs of their constituents.

M. A. Massengale

Alternatives to Grazing Drought-Stricken Pastures

by Ivan Rush, Panhandle Research and Extension Center, UNL

Unfortunately, many producers have been in prolonged drought conditions, and the thought of another dry year is not pleasant. Long-range weather forecasters have not been very optimistic about high rainfall. Even though records show that in several parts of the country rainfall was considerably below average last year, many ranchers had very good grazing conditions because of the timing of the rain.

Various alternatives exist in the event of a dry spring or summer for the cow-calf producer. Perhaps the first is to resist the temptation of early turnout on short grass unless rotating off the turnout pastures is an option. Forage specialists continue to emphasize that if grass is grazed too early, not only is summer-long production sacrificed, but long-term plant vigor is also hurt. Fortunately, this spring hay is in plentiful supply and much more economical than in past years, so it is more economical to hold cows off pasture than when hay prices were relatively high.

In some operations yearlings are held over when forage is in ample supply, but this may not be the year to hold many or any yearlings over if the alternative means cutting a good productive cow herd.

Even in drought years, some areas receive rains and cattle can be moved into those areas. The cost of leasing grass is oftentimes considered to be very high, but we need to ask – compared to what? If hay is priced \$50 per ton fed to cow-calf pairs, and the pairs consume 30-35 pounds of hay per day, the daily cost would be \$.75 to \$.88, equivalent to \$22.50 to \$26.25 per month for grazing a pair. If hay cost increased to \$65 per ton, it would be equivalent to \$29.25 to \$34.13 per pair per month. These comparisons assume that performance would be the same on the grazed and hay-fed cattle. Also, trucking of pairs can increase cost considerably depending on distance hauled. If we assume trucking cost at \$2.15 a loaded mile one way, and the cows are trucked 200 miles and grazed for five months, the monthly grazing cost increases about \$4.50 per month. Other considerations such as care and management of the cows are also obviously important, yet hard to put a dollar value on.

In the last two years grain prices in comparison to hay were much lower, making grain a more economical source of energy. Several cattlemen fed high-concentrate rations to the cow herd. With the increase in grain prices and the large supply of hay, it is now usually cheaper to supply the largest portion of a ration with hay. In many areas by-product feeds offer good sources of protein and energy supplements to forages, and are usually needed with many grass hay rations.

If the spring grass is looking adequate and a decision is made to stock the ranges at the normal rate, and later



Fence line weaning appears to lower stress on calves. Note several calves are lying down two hours after being separated from their mothers.

drought conditions occur, several things can be done to help get through the year. The first would be to early wean the calves. Getting the pressure off the cow is very important when nutrient intake is poor. Considerable research and experience find that young calves (past three months of age) are easily weaned; they go on feed easily and the level of sickness is usually very low. Young calves are also highly efficient in feed conversions, often showing as low as 4:1 at a young age. It is critical that a high-quality, relatively high-energy and high-protein ration be fed to the light calves. Protein should be at least 14% all natural and the concentrate level should be at least 50%. By-product feeds that are high in readily-digestible fiber, such as by-products of the corn processing industry, wheat midds or beet pulp, are all excellent ration ingredients and are highly palatable. Again, research and producer experience have shown that weaning stress can be less for the calf by weaning the calf across the fence from the cow. Apparently, the visual and nose-to-nose contact lowers the calf stress.

Some data also show that the early-weaned calves have a higher marbling score or have a higher percentage of choice grade at harvest. That trend appears with large numbers in feedlots; however, differences are not great enough to measurably change sale value.

Perhaps the major advantage of early weaning is maintaining the cow in a higher condition score, resulting in lower maintenance cost through next winter, and more profit to the producer.

The bottom line is we shouldn't get stressed over the potential drought, but should have some kind of an alternate plan in place in case these dry conditions persist. Several alternatives are available that hopefully will provide opportunities to keep the herd intact and profitable.

Dave and Loretta Hamilton: Grazing and Ranch Management Mentors

by Dana Larsen, Natural Resources Conservation Service, USDA

The team of Dave and Loretta Hamilton is one of the ten mentors in the Nebraska Grazing Lands Coalition's Grazing and Ranch Management Mentors network. Mentoring is one way to share the experience and knowledge from successful ranchers on a wide range of topics. The Hamilton Ranch north of Thedford was established in 1898 by Dave's great grandfather, T.P. Hamilton, who started with a single section of Sandhills rangeland. Today the ranch encompasses nearly 18,000 acres of owned and leased properties, supporting the 4th generation of Hamiltons. Dave and Loretta have particular experience in a number and variety of grazing lands and ranch management topics:

Drought management. Drought has affected Sandhills ranches in the past few years. Dave manages his livestock before, during and following drought in a 3-step system: 1) reduce or eliminate the yearling enterprise; 2) cull cow numbers based on production records; 3) observe soil moisture conditions in the year following drought and continue to cull based on grazing production records if the drought is likely to continue.

Monitoring and record keeping. Dave and Loretta keep detailed pasture management records that include pasture numbers or names, and dates that livestock are turned in and turned out of pastures. Livestock are moved from pasture to pasture in a rotation based on a planned grazing system. Recently the Hamiltons have been using the Sandhills Grazing Response Index, a grazing management tool developed by the University of Nebraska Extension to assist them in deciding the sequence of their grazing rotations. Long-term range monitoring sites were established in 1999 following a large wildfire and a severe hail storm, which helps them track changes in the plant community.

Economics of grazing management. The Hamiltons consider the cost aspects of dry-lotting cows in winter versus winter grazing if and when the winter grazing is available. Calculating costs at each stage of production in the cow's annual cycle is as critical as knowing costs at each segment of the weaned-calf-to-finished-animal cycle.

Complementary grazing systems. An evaluation of the economics of cropping and grazing has helped Dave decide to convert some of his irrigated alfalfa hayland to cool-season grass for grazing. It is one strategy that helps

stretch the forage availability during drought, allowing him to keep more animals.

Wildlife habitat and hunting. Dave's family started planting trees for windbreaks and wildlife food and cover in the 1940s. The addition of more watering sites for livestock grazing has also enhanced wildlife habitat and populations. In average to good rainfall years, their rotational grazing system provides a number of pastures with forage regrowth that supports both cattle and wildlife. Dave and Loretta have expanded their interest in wildlife and hunting into

a subsidiary business called Antelope Valley Outfitters LLC, now in its fourth year. View their Web site at www.antelopevalleyoutfitters.com for more information about this enterprise.

Marketing. Dave recognizes that market volatility is increasing with consumer reaction to animal disease and other market perils. To help manage this additional risk, retaining ownership of calves and yearlings involves keeping costs at each segment, and shedding risk by selling as calves or feeders when an acceptable profit is available. Using 20 years of carcass data to promote the sale of their feeders or to target them to a branded beef program has been an added advantage.

The Hamiltons have years of experience in ranching, yet Dave considers himself a grass producer first and a beef producer second, using his livestock as a grass management tool. Contact Dave and Loretta if you need to talk about grazing management, drought, marketing, economics, or guided-fee hunting. As Grazing and Ranch Management Mentors, they will share their ideas and experiences with you, look at your perspectives, and help you with your own ranching goals.

Dave and Loretta Hamilton
HC 58, Box 14
Thedford, NE 69166
(308) 645-2521
dhamilton711@yahoo.com

Editor's Note: The Hamiltons' commitment to educating others is further evidenced by the fact that Dave also serves on the Stakeholders Advisory Board for the Grazing Livestock Systems (GLS) undergraduate major, administered by the Center for Grassland Studies, and has supervised students conducting their GLS internships on the Hamilton Ranch.





2004 Nebraska Grazing Conference in Kearney August 10-11

The fourth annual Nebraska Grazing Conference will be held at the Kearney Holiday Inn on August 10 and 11. The conference, a collaborative effort with many co-sponsors, began in 2001 and has consistently drawn 200+ participants from several states.

While the program was not finalized as this newsletter went to press, we can provide some information on speakers, their affiliations and topics: John Caveny, Illinois, carbon trading; Martin Kleinschmit, Center for Rural Affairs, study involving carbon sequestration; Al Dutcher, UNL, weather makers and how forecasters use them; Walter Schacht, UNL and Doug Goodin, Kansas State University, using the Grasslands Ecological Monitoring System to aid in response to drought; Lani Malmberg, Wyoming, using goats in grazing systems to control weeds; Chad Peterson, Nebraska, managing 3,000 goats; Lowell Moser, UNL, how plants grow; Greg Ibach, Nebraska Department of Agriculture, followed by rancher response panel, Premise ID program; Jerry Holechek, New Mexico State University, grazing management to meet multiple objectives; and a producer panel telling "Why I Do What I Do."

The two-day pre-registration fee of \$70 is due to the Center for Grassland Studies by August 1. The fee covers lunch both days, the evening meal, break refreshments, and materials. One-day registrations are also available. Late fees apply to registrations received after August 1. Checks are to be made out to **2004 Nebraska Grazing Conference** (sorry, credit cards not accepted).

Participants of any of the three previous Nebraska Grazing Conference as well as all Nebraska extension educators will receive the brochure in the mail. Others may contact the CGS office to be put on the mailing list. Information and registration form are also on the CGS Web site (www.grassland.unl.edu).

CGS Associates

Recipients of the Holling Teaching Excellence Awards included **Robert Klein** (Senior Faculty) and **Larkin Powell** (Junior Faculty).

Dan Walters was selected to receive the 2004 UNL College of Agricultural Sciences and Natural Resources Distinguished Teaching Award.

Recipients of the Teaching Council/Parents Association Recognition Award included **James Stubbendieck** (7th time) and **Kim Todd** (3rd time).

Tiffany Heng-Moss was inducted into Gamma Sigma Delta, the honor society of agriculture.

XX International Grassland Congress, Ireland, 2005

University College Dublin will be the primary location for XX International Grassland Congress, June 26-July 1, 2005. As the Web site (www.igc2005.com/) states:

"The Congress theme, (*Grasslands – a Global Resource*), reflects the concept of grassland as a vital resource in most of the agro-climatic zones of the world. Grasslands offer the possibility of increasing food supplies and income generation, while at the same time, they service the soils/crops/animal interface which is basic to sustainable farming systems.

Grasslands are also a global resource in relation to wildlife and biodiversity and they are crucial for soil stabilization and water quality. Current advances in the grassland sciences have a proven potential to promote the economic development and environmental stability of regions, nations and peoples, particularly in some of the most resource-limited areas of the world."

The week-long event consists of plenary papers as well as simultaneous sessions that will address topics in the general areas of: (1) Efficient Production from Grassland, (2) Grassland and the Environment, and (3) Delivering the Benefits from Grassland. Reports of new work are invited for either oral or poster presentation. About 50 papers will be accepted for oral presentation specifically related to the sessions listed in the Outline Programme. Up to about 750 papers will be accepted for presentation as posters. Deadline for both types of papers is August 31, 2004. Instructions for submitting paper proposals and other details, including optional tours, are on the Web site. You can also contact the CGS for a brochure.

Allan Savory on Holistic Resource Management at Northeast Nebraska Program

Allan Savory, a name synonymous with Holistic Resource Management, will be the featured speaker at a program held the evening of June 14 through June 15, 2004, at Niobrara State Park Lodge. Savory will speak on decision making, with emphasis on university research as well as other topics. Additional talks by other speakers include: using the tools of rest, grazing and animal impact, applying holistic management on the farm, and community dynamics. The second day includes a walkabout tour.

Registration: \$100.00 for both days (includes 3 meals); \$80.00 for Day 2 only (includes 2 meals); \$30.00 for Day 1 only (includes 1 meal). Second family or business members will be half price. This program is limited to 175 participants. Pre-registration is required by June 1. Scholarships may be available. To pre-register, contact the Knox County Extension Office at PO Box 45, Center, NE 68724, 402-288-5611, knox-county@unl.edu.

Loess Hills Conservation Measures Improve Rangeland Conditions and Aid American Burying Beetle in Nebraska

by Thomas Walker, Jr., Nebraska Game and Parks Commission
 Jerry Volesky, Department of Agronomy and Horticulture, UNL
 Wyatt Hoback, Department of Biology, University of Nebraska at Kearney

The Loess Canyons area of southeastern Lincoln County, Nebraska features wind-deposited, highly erodible soils that over time became deep canyons with high ridges, steeply sloped walls, and relatively narrow valleys.

This geography limits cultivation but is suitable for cattle grazing. Historically, prairie fires and other forces prevented the establishment of woody vegetation in this region, and trees were probably limited to steep, north- and east-facing slopes. Rocky Mountain Juniper and a few deciduous tree species were likely found in these areas in small pockets untouched by fire. Historically, these Loess Canyons supplied diverse prairie grasses and also allowed the survival of Nebraska's only endangered insect: the American Burying Beetle (ABB). A population of this beetle has persisted here in the Loess Canyons, while populations in other areas of Nebraska and many other states have apparently died. Today the Loess Hills, with their rich grazing lands and unique species, are facing many threats. This rangeland area is being taken over by invasive species, including Eastern Red Cedar trees and Smooth, Downy and Japanese Brome grasses. The ongoing drought appears to be contributing to the invasive species problems, and it is important to ranching, wildlife and the ABB that the spread of these species be stopped.

Much like a canary in a coalmine, changes in species populations indicate changes in the environment. The ABB appears to be especially sensitive to changes, as it has been extirpated from most of its former range in the U.S. Among the problems it faces are: loss of habitat to row crop agriculture, changes in carrion resources, and exposure to pesticide. Historically, these beetles were found from the East Coast west to South Dakota and Texas. Their distribution and abundance have greatly decreased since settlement, and now they are only found in portions of Rhode Island, Arkansas, Kansas, South Dakota, Oklahoma, and Nebraska. The ABB is a member of a unique group of carrion beetles that bury the carcass of small animals (up to the size of cottontail rabbits and doves) and use these

carcasses to raise their offspring. Thus, the ABB is dependent on specific animal carcasses for food and for successful reproduction. Less diverse habitats typically have lower

densities and/or diversity of animal species, and trapping of small mammals in the Loess Canyons found only deer mice to be abundant. It appears that the introduction of cedar trees may have initially added diversity to the area, but the abundance of these trees now threatens to reduce diversity. This could be devastating to the ABB and point to a bleak future for other wildlife and ranching.

Largely because of the prevention and control of fire, and perhaps from local introductions of Eastern Red

Cedar, conditions are quite different today. Cedars and other woody species now dominate significant portions of the landscape. The encroachment of woody species has greatly reduced the available acres for grazing.



An adult American Burying Beetle (*Nicrophorus americanus*).



This aerial view of the Loess Canyons shows the abundance of cedar trees in a formerly grassland-dominated landscape.

Some ranchers adapted to the changes, reducing their stocking rates. Others did not, which has led to some areas being overgrazed, an increase in undesirable species, and poor quality wildlife habitat. In addition, grazing patterns have changed, and most ranchers now utilize season-long grazing — May to October — year after year. This has led

Photo credit: NEBRASKAland Magazine/
Nebraska Game and Parks Commission

Before



The Landowner Incentives Program, and an endangered insect, have given Loess Canyon rangeland owners an opportunity to regain some of the grassland they have lost over the last 30 years.

After



to changes in grass species composition. The rangeland is now dominated by cool-season grasses, primarily brome and wheatgrass species. Native warm-season grasses, wildflowers and shrubs have persisted on some of the steeper slopes, but cannot compete with the cool-season grasses under current conditions. An ongoing drought has added to the dominance of cool-season grasses, as spring moisture is consumed by cool-season species, and a lack of summer precipitation for several years has prevented reproduction by warm-season species.

Through cooperative conservation efforts between agencies and private landowners, there is a chance to return the Loess Hills to their former health. The Landowner Incentive Program (LIP) is a conservation effort targeted at private land conservation of at-risk species including endangered, threatened, and other declining species of wildlife or plants. This program allows for 75% cost-share on a variety of land management practices, provided that the management practices will benefit one or more at-risk species. Grasslands are among the most threatened habitats in the United States, and there are many at-risk species that can benefit from improved grassland conditions. To improve conditions for the ABB in the Loess Canyons, an attempt is being made to reduce cedar dominance and alter grazing patterns to increase warm-season grasses and other plants.

Funding through LIP was secured by the Nebraska Game and Parks Commission (NGPC) during 2003. This funding allowed NGPC biologists to look for sites to promote sound management of privately-owned lands in attempts to benefit at-risk species including the ABB. Meetings were held and one landowner in southeastern Lincoln County stepped forward, wanting to return his rangeland to "how it was when I was a kid." In the 1950s, there were hardly any trees, including cedars, and warm-season grasses, native shrubs and wildflowers dominated the area.

In an effort to set back cedar encroachment on this site, cedars were mechanically removed from approximately 80

acres of a 240-acre pasture. Cedar removal was just one step of the project, however. In exchange for tree removal, the landowner agreed to reduce stocking rates slightly below the recommended rate and alter grazing patterns for a five-year period. During the first two years of the agreement, the landowner has agreed to utilize intensive early stocking, where the pasture is heavily grazed for a six- to eight-week period in April and May. Heavy grazing pressure during the cool season, followed by rest during the warm-season, should give native warm season grasses an opportunity to out-compete the cool-season grasses. In addition, hoof action of cattle in this period should provide some open ground for annual weeds and native wildflowers to grow. After two seasons of intensive early stocking, the site will be re-evaluated to determine if more of the same is necessary, or if the landowner can move into a rotational grazing system.

The overall goal of this project is to improve conditions for the ABB. Although little is known about their habitat requirements or preferences, it is evident that these beetles are more numerous where high-diversity habitats are found in large, un-fragmented tracts. Data also seem to show that grazing maintains suitable habitat, giving landowners the opportunity to utilize the land while helping an endangered species. This project will increase vegetative diversity, which will likely increase diversity and abundance of small mammals, birds and reptiles, which in turn should lead to improved feeding and breeding opportunities for the ABB. In addition, the planned management practices will lead to improved rangeland conditions for the rancher and his livestock. It is expected that this project will serve as a model for other Loess Canyon ranchers to follow, further improving conditions for the ABB in the Loess Canyons. This project will also show that private landowners and resource professionals, working together, can improve rangeland conditions and wildlife habitat.



Resources

Agroecosystem Analysis, 2004. CGS Associate Charles Francis is co-editor and chapter co-author of this monograph published by the ASA, CSSA, and SSSA. According to the

Web site from which it can be ordered (www.asa-cssa-sssa.org/cgi-bin/Web_store/web_store.cgi), the 207-page publication "provides an excellent overview of the current state of the science of agroecology. Leaders in this field give detailed analyses of key topics such as multidimensional thinking, multifunctional economic analysis, whole-farm planning, agricultural conservation at the landscape scale, agroecosystem functions that benefit society, and ecological morality. A critical analysis of our current approach to designing agricultural research, teaching, and funding programs is provided, followed by an alternative vision of how we should redesign these programs in more holistic, sustainable manners. Research and education priorities, suggested across a spectrum of spatial scales for the full breadth of key topics in agroecology, will be valuable guidance for farmers, researchers, teachers, students, and policymakers." Agronomy Monograph Number 43. Price: \$90.00 (members first copy \$75.00).

The proceedings from the Second National Conference on Grazing Lands, held December 7-10, 2003, will be available in late spring, 2004. The program containing a list of the 200+ speakers and their topics can be found at www.glci.org/2NCGIndex.htm. CD Rom copies will cost \$15 each; a limited number of hard copies may be available, cost for which is unknown at this time. To order, contact Ann Harris at the Society for Range Management, 303-986-3309.

The purpose of the PRAIRIEMAP project (prairiemap.wr.usgs.gov/prairie.htm) is to identify and collect spatial data layers needed for research and management of prairie grassland ecosystems. These data sets can be queried, viewed, and downloaded from an FTP site, and can be used to identify factors that influence prairie wildlife and plant species. The data can also be used to help guide management efforts and decision-making processes for listing of endemic species as threatened or endangered. A similar project for sagebrush and shrubsteppe ecosystems is at sagemap.wr.usgs.gov.

A few selected Web sites with beef production/marketing publications: www.animalscience.unl.edu (click on Area of Interest); attra.ncat.org/livestock.html; www.kansassustainableag.org/Pubs/B.htm#beef; aes.missouri.edu/fsrsc.

Calendar

Contact CGS for more information on these upcoming events:

2004

- June 3-5:** The Nature of Lewis & Clark on the Great Plains, Center for Great Plains Studies 2004 Symposium, Nebraska City, NE, www.unl.edu/plains/events/2004
- June 10-11:** Nebraska Cattlemen Midyear Conference, Scottsbluff, NE
- June 12-16:** American Forage and Grassland Council 2004 Conference, Roanoke, VA, www.conted.vt.edu/afgc
- June 14-15:** Allan Savory and Holistic Management, Niobrara State Park Lodge, NE
- June 15:** 2004 Turfgrass Field Day, Mead, NE, turfgrass.unl.edu
- June 20-25:** Nebraska Range Short Course, Pine Ridge area of north-west Nebraska, agronomy.unl.edu/rangeshortcourse
- July 13:** Sand Hills Trails: Ancient, Historical and Modern, sponsored by "Sand Hills Discovery Experience," Ainsworth, NE, www.ainsworthlinks.com
- July 24-28:** Soil and Water Conservation Society annual meeting, St. Paul, MN, www.swcs.org/t_what2004confgeninfo.htm
- Aug. 9-13:** Cattle Industry Summer Conference, Denver, CO
- Aug. 10-11:** 2004 Nebraska Grazing Conference, Kearney, NE, www.grassland.unl.edu/grazeconf.htm
- Oct. 7-8:** Nebraska Section, Society for Range Management (theme is prescribed burning), Ainsworth, NE
- Oct. 31 - Nov. 4:** Science to Secure Food and the Environment, 2004 ASA-CSSA-SSSA International Annual Meetings with the Canadian Society of Soil Science, Seattle, WA, www.asa-cssa-sssa.org/anmeet
- Dec. 8-10:** Nebraska Cattlemen Annual Convention, Kearney, NE

2005

- June 26 - July 1** XX International Grassland Congress, Dublin, Ireland, www.igc2005.com

Nebraska UNIVERSITY OF
Lincoln CENTER FOR
GRASSLAND STUDIES

222 Keim Hall
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