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Summary Analysis of Grazing Yearling Response to Distillers Grains

by Terry Klopfenstein, Department of Animal Science, UNL

Beef calves from weaning until they enter feedlots, developing heifers, and beef cows are fed primarily forage diets. Especially in the winter, forages are low in protein and phosphorus. The protein in forages is highly degraded in the rumen and the cattle should be supplemented with undegraded (bypass) protein to meet metabolizable protein requirements. Distillers grains (wet or dry) are an excellent source of undegraded intake protein (UIP) and phosphorus. Wet grains were compared to dry grains and the value of the protein was similar. This suggests that the high escape protein value of distillers grains is due to the innate characteristics of the protein and not to drying or moisture content.

Stocker calves, developing heifers and cows

may need energy supplementation in addition to supplemental protein and phosphorus. It is advantageous if the same commodity can be used for supplemental energy as well as protein. In a calf growing experiment, we have shown that distillers grains have 125% the energy value of corn grain. For example, corn at \$2/bu is \$75/ton (90% dry matter). That means dried distillers grains would be worth \$93.75/ton as an energy source. Additional advantages for distillers grains are that they contain very little starch and therefore should not depress fiber digestion.

Dry distillers grains contain approximately 65% UIP (% of crude protein), consequently forage-based diets that include dried distillers grains fed as an energy source are commonly deficient in degradable intake protein (DIP) but contain excess metabolizable

protein (MP). Cattle convert excess MP to urea, which is potentially recycled to the rumen and can serve as a source of DIP. Two experiments were conducted and results indicate adding urea to meet the degradable intake protein requirement is not necessary when dried distillers grains are fed as an energy source in forage-based diets.

The supply of distillers grains (DG) will triple or quadruple in the next few years as the Nebraska ethanol industry grows. The

price of DG at the plant has ranged from \$70 to \$85/ton this past year. The price of grazing land (or rental cost) has increased steadily over the past several years. The average price for summer pasture

in 2006 is about \$27.31 per AUM (680 lb dry matter) or about \$80/ton. We estimate that DG can be delivered to yearlings on pasture for about \$138/ton dry matter (\$120 as is). Therefore, DG would be about 166% the price of grass. However, DG has about 200% the energy value of grass. Therefore, we have hypothesized that it would be economical to supplement DG to yearlings on grass.

Data were summarized from seven grazing experiments where DG were supplemented to grazing yearlings on summer pasture. One of the experiments was conducted in southeast Kansas on smooth brome grass pasture, one in the Kansas Flint Hills, three were conducted on smooth brome grass at the Agricultural

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Cattle consuming dried distillers grains in a summer grazing trial at the Gudmundsen Sandhills Laboratory.



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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.

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FROM THE DIRECTOR

The popular press carried a news item recently about the building of a “seed vault” in a remote mountain outpost above the Arctic Circle. This “seed vault,” as it is called, would be built in Svalbard, Norway. Building this “seed vault” is an excellent idea, as it would be the ultimate backup in the event of a man-made or natural global disaster – the place where people could obtain seed of an improved cultivar, or for a specific genetic trait, rather than having to start again from ground zero.

Several seed banks exist today throughout the world, including the United States. However, none of them is as secure as this new facility would be. Most of the existing seed banks are “working” banks, with the contents available to researchers, plant and animal breeders and others.

Plant and animal germplasms are the very underpinnings of human survival, and they have been selected and improved for thousands of years dating back to the beginning of agriculture and the domestication of plants and animals. Collection and storage of plant germplasm have been in existence for decades, whereas microbial, insect and animal germplasm preservation has been more recent. The current germplasm resources in the United States are based heavily on international goodwill. Areas of the world where wild ancestors and relatives of economic plants and animals are found abundantly are becoming more unstable.

Our national economy is highly dependent on plants and animals that are, for the most part, not native to this country; therefore, it is vitally important we give this effort adequate support and attention. Access to germplasm sources from the international arena for both cultivated and wild species is increasingly being restricted because of plant variety protection, patenting of genes for commercial purposes, national treaties, legislation, etc. Countries have become less willing to let germplasm flow freely from their borders to other countries. Therefore, it is all the more important that we preserve, enhance and renew the germplasm sources we already have in our gene banks.

Our country's abundant food, fiber and feed supplies, along with an increasing need for seed stock for a renewable fuel source, are based on relatively few species of plants and animals, and most of them have a high degree of uniformity. These factors increase their vulnerability to terrorists or natural acts. We need to maintain a sufficient level of diversity in our plant and animal gene pools for those life forms of importance to human survival and the economy. When you narrow your diversity, your ecosystem becomes more susceptible to diseases, insects, climatic changes, et al. Germplasm diversity does provide a degree of buffering against these adversities, and it is better for us to be prepared for such uncertainties.

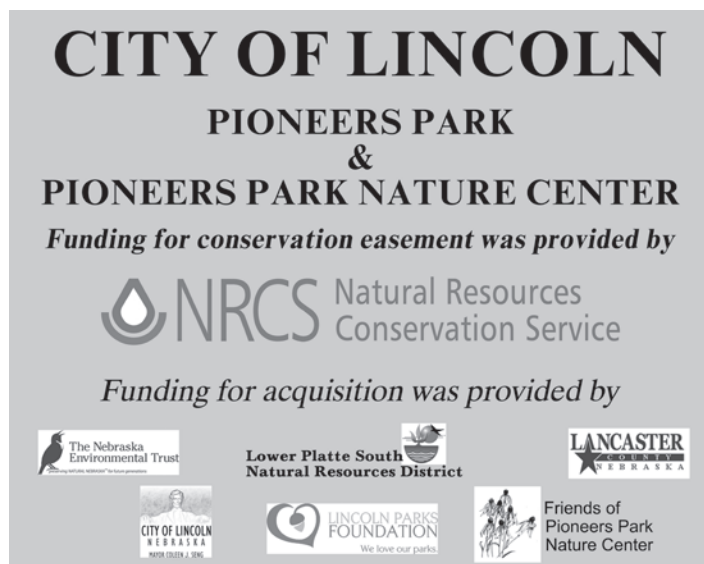
M. A. Massengale

Landowner, Foundation, City and Federal Government Preserve Native Prairie for Grazing and Education

by Steve Chick, USDA Natural Resources Conservation Service

The first USDA Grassland Reserve Program easement to preserve native prairie became a reality recently, according to Natural Resources Conservation Service District Conservationist Dennis Schroeder of Lincoln. It is adjacent to Pioneer's Park west of Lincoln, and involves 222.28 acres.

At the actual time of filing the easement, Lincoln Parks and Recreation Foundation was the owner of the land (having purchased it from the Martin family), and the Foundation eventually sold it to the City of Lincoln. This easement was a huge partnership effort of the individual landowner, the foundation, city government, and a USDA program – all working towards a common goal of preserving this prairie land. A sign at the site shows this partnership to the public.



The Grassland Reserve Program is a voluntary program offering landowners the opportunity to protect, restore and enhance grasslands on their property. The program conserves vulnerable grasslands by avoiding conversion to cropland or other uses and by helping maintain viable ranching operations.

As with all NRCS programs, the landowner was the biggest partner. "Without the dedication of the Martin family to see that this area remains in a natural state, the project would not have happened and the land would have been prime for developers to use," said Schroeder.

With the easement in place, the land will be managed as a tallgrass prairie grassland system utilizing prescribed fire and buffalo to manage the vegetation. And, as a bonus, with the City of Lincoln purchasing the property, there will be many opportunities for the public to become more educated about the natural habitat of this ecosystem. There should be additional outdoor classroom opportunities for area schools to also take advantage of this resource. With the easement, the City agrees to implement an NRCS-approved grazing plan to maintain the viability and vigor to the grassland.

Grassland Ecology and Management: A New Name for the Range Major

by Walter Schacht, Department of Agronomy and Horticulture, UNL

The undergraduate range program at the University of Nebraska-Lincoln (UNL) was initiated in the 1960s as an option within the Agronomy major. With about 50% of Nebraska's land area classified as rangeland, the need for a range curriculum at UNL was obvious. The range program evolved into a major that was eventually offered through the School of Natural Resources as the Rangeland Ecosystems major. The range curriculum was developed to meet the civil service requirements of the rangeland conservationist position in the Natural Resources Conservation Service (NRCS) of USDA. The major has been appealing to students interested in rangeland ecology and management with

a career goal of working for a federal or state government agency (e.g., NRCS or Cooperative State Research, Education, and Extension Service) in land management and/or advising. Students in the range major generally have had a background in land management and/or production agriculture and have been from central and western Nebraska.

The educational objectives of the range major and the potential career goals of range students have changed as alternative land uses to livestock grazing have developed. The focus of the range major continues to be plant science and ecology, but curriculum

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Befriending Birds: Why Should Landowners Care about Integrating Wildlife Conservation with Livestock Production? The Reasons Are Plenty!

by Kindra Gordon, Grazing Lands Conservation Initiative

If someone asked how many cattle you ran on your ranch, surely you'd know a number. But if you were asked how many species of birds and wildlife could be found on your land, would you know? Would it be important to know?

Tammy VerCauteren with the Rocky Mountain Bird Observatory in Fort Collins, CO, wants to get landowners thinking about those latter questions and to help them realize the important role birds and other wildlife play in rangeland settings.

VerCauteren, who works as an outreach director informing land managers about integrating bird conservation with rangeland management, says birds are ecologically and economically important to the environment.

Why birds are important

Economically, birds can mean big business. With nature-based tourism now the fastest growing segment of the tourism industry in the U.S., VerCauteren says many landowners are finding that offering wildlife or birding activities on their land can offer value-added opportunities. She reports that one in three of all Americans consider themselves bird watchers. And, a 2001 survey found that over 80 million Americans participated in some form of recreational activity related to fish and wildlife.

But even if nature tourism isn't one of your ranch's future goals, wildlife – particularly birds – also play critical ecological roles by helping keep rodents and insects at manageable levels.

"Birds eat insects and rodents; they spread seeds; and serve as prey for a diversity of other wildlife species," says VerCauteren. As examples, she tells that a Baird's Sparrow will collect an estimated 135 insects – mostly grasshoppers – daily to feed its young, and a pair of Ferruginous Hawks will kill roughly 500 ground squirrels, prairie dogs and rabbits in a single breeding season. These activities by birds help suppress insect and rodent populations, often keeping them below outbreak levels, VerCauteren points out.

Additionally, VerCauteren says, "Birds let us know when there are environmental concerns." For instance when there was DDT in the environment, thin egg shells for birds of prey including Bald Eagles and Peregrine Falcons were an initial indicator that there was something toxic in the environment.

She adds that since birds are closely tied to the available habitat structure (height and density of vegetation), they can serve as indicators of habitat change, which in turn can reflect changes in land management strategies and range health.

"A healthy bird community should be a healthy grassland for livestock as well," she says. So if something starts to decrease the diversity of bird species or populations, it may indicate a decline in range health that needs to be addressed.

Lastly – and perhaps the most important factor in conserving grassland birds – are the implications it has for the future. Not only will it mean future generations can enjoy a diversity of species, but implementing beneficial conservation efforts for birds

and wildlife may also help keep management strategies within the hands of landowners and operators rather than being dictated by regulatory action. This is becoming even more critical as contentious issues continue to arise with sensitive, threatened, and endangered species.

How to manage for birds

Given all those reasons for the importance of birds and other wildlife, what can you do to manage for more of them on your land? VerCauteren suggests land managers start by recognizing the habitat requirements of grassland birds. This includes looking at bare ground, species composition of the vegetation and structure of the vegetation.

"Birds need habitat with diversity. If it all looks the same, you're not going to have as many birds. So we encourage landowners to try to keep a mosaic of conditions to meet the broader needs of birds," she says. VerCauteren offers these guidelines for effective bird habitat:

Focus on habitat structure. VerCauteren says grassland bird communities are generally influenced more by habitat structure than the particular species of plants in the habitat. Structure consists of many factors including height and density of vegetation, topographic features, ground cover and man-made structures, and is important in providing nesting substrates and opportunities for feeding, resting, and perching.

So, the more structurally diverse a habitat is with grass, shrubs, forbs (flowering plants), etc., the more species-rich the bird community found there. For example, some species require taller, denser vegetation, while others require short vegetation, for attracting mates, nesting and brood rearing. Therefore, VerCauteren says grasslands with a patchy structure will provide opportunities for multiple species to co-exist.

Pay attention to species. While structure can be the biggest factor impacting bird habitat, it doesn't mean plant species composition isn't important. For instance, in the case of Sage Grouse, not just any shrub species will meet the habitat needs – these birds need sagebrush.

VerCauteren suggests that if you don't have a large land mass that can offer diversity of habitat structure, perhaps you should focus on critical birds that are key to your area and the habitat you can provide.

Consider management implications. According to VerCauteren, management factors can greatly influence the available habitat structure for birds including the use or non-use of fire, haying, grazing, and methods of invasive species control.

As an example, heavy spring grazing year after year in the same pasture may reduce, or eventually eliminate, cool-season grasses in that pasture. This can be detrimental to early-season nesting birds that require a cool-season grass component.

As a solution, land managers should be aware of the habitat needs of birds and wildlife and try to integrate those needs with their rangeland management. Strategies might include:



Implementing a rotational grazing system that varies the grazing patterns and timing in pastures annually.



Using fire as a tool to create disturbance and alter habitat structure.



Waiting to hay areas until after July 15, when most birds are finished nesting.



Altering use in riparian areas to allow birds to utilize the area, or using escape ladders to protect water quality and minimize loss of birds and other wildlife in stock tanks



Establishing native shrubs, legumes or forbs to add diversity to the habitat. Avoid establishing monoculture stands of forages.



Considering stocking rate. Overstocking will reduce habitat quality for most species of wildlife and birds.

Of these suggestions, VerCauteren emphasizes that there is a balance between livestock and wildlife. She says, "Grazing is a critical tool and birds need different levels of grazing to keep diversity in their habitat. Grazing can also be an effective tool for invasive species management."

For producers interested in enhancing bird and wildlife habitat on their lands, VerCauteren says there are many partnership opportunities available for funding through the U.S. Fish and Wildlife Service, Natural Resources Conservation Service, state agencies, and several private and state incentive programs. Contact any of these organizations for more information.

To learn more about Rocky Mountain Bird Observatory and the programs they offer, contact Tammy VerCauteren at 970-482-1707 or tammy.vercauteren@rmbo.org.

Editor's Notes: This article, reprinted courtesy of Grazing Lands Conservation Initiative (www.glci.org), first appeared in the May-June 2006 issue of *GLCI News*. VerCauteren received her M.S. degree from UNL.

Summary Analysis of Grazing Yearling Response to Distillers Grains (continued from page 1)

Research and Development Center near Mead, NE, two were on Sandhills upland range near Stapleton, NE, and one was on upland range at the Gudmundsen Sandhills Lab near Whitman, NE. Three of the experiments were conducted with yearling heifers and five were with yearling steers. Lengths of trials ranged from 54 to 196 days. The DG supplementation levels were about .5 and 1% of body weight. Finishing performance of the yearlings was determined with cattle from six of the eight experiments.

Six additional experiments were summarized where growing calves were fed harvested forage and supplements of DG. Forage included alfalfa hay and silage, grass hay and grain-free sorghum silage. The DG were supplemented at a minimum of two levels. The lower level served to meet or exceed protein requirements. Higher levels of DG served primarily as an energy source. The objective was to determine the effect of DG supplementation on forage intake.

Mean body weight of the yearlings at the start of the grazing season was 638 lb and ranged from 437 to 811 lb. Daily gains of non-supplemented cattle averaged 1.60 lb/day and ranged from 1.08 to 2.31 lb/day. By feeding DG at .48% of body weight, average daily gain (ADG) increased to 2.13 lb/day and feeding at .92% of body weight increased ADG to 2.49 lb/day. The response in ADG for each 1% body weight supplementation was .95 and .99 lb. This suggests the response was similar with supplementation up to .93% body weight.

The .48% body weight level of feeding was about 4 lb DG/day (at 90% dry matter). The 92% body weight level was about 7.5 lb/day. We estimate that DG can be delivered to the cattle for about \$120/ton (\$.06/lb). The daily costs were \$.24 and \$.45 per day at 4 lb DG/day and 7.5 lb DG/day, respectively. The average grazing period was about 100 days, so 50 and 89 lb of gain were

achieved with the 4 and 7.5 lb feeding levels.

In six experiments, ADG and(or) feed efficiency in the feedlot phase, following grazing, was measured. We conclude that extra gain produced by supplementing DG on grass does not have a negative effect on subsequent feedlot performance if the grazing period is not more than 150 days and cattle are slaughtered at equal fatness.

Calves fed harvested forages supplemented with low levels (about 1.5 lb/day) of DG (controls) gained 1.62 lb/day, which is comparable to gains of the yearlings on grass. The mean substitution rate was .48 lb of forage per lb of DG supplemented. We conclude that in a grazing situation at a moderate stocking rate, one can expect to have a reduction in grazed forage intake of .5 lb for each lb of DG (dry matter) supplemented. Yearlings supplemented with 4 lb DG gained 53 additional lb in 100 days at a cost of \$24. Using five-year average prices, the value of the additional gain was \$31.10. Approximately 189 lb of forage would be saved at a value of \$7.60 for a total return of \$38.70. At the 7.5 level of supplemented DG, the cost would be \$45 for DG. An additional 89 lb of gain worth \$49.96 would be obtained plus \$13.66 for reduced forage use for a total of \$63.62.

Because the yearlings that were finished after supplementation on grass gained at similar rates and efficiencies, we can assume the extra weight gain on grass is maintained to market with no additional costs. The five-year average price for that gain is \$78/cwt. With the value of the extra gain and forage savings, the yearlings supplemented with 4 lb/day DG would return \$48.94 for \$24 invested in DG. Those supplemented with 7.5 DG/day would return \$83.08 for \$45 invested in DG. It would be necessary to retain ownership through the feedlot to realize these returns.

Another Successful Nebraska Youth Range Camp

by Daryl Cisney and Mary Reece,
Nebraska Section of the Society for Range Management

The 43rd Annual Nebraska Youth Range Camp was held June 12-16, 2006 at the Nebraska State 4-H Camp located at Halsey, NE. Thirty-nine first-year and returning campers from throughout Nebraska participated in this year's event. The Nebraska Range Youth Camp is principally sponsored by, and is one of the premiere activities of, the Nebraska Section of the Society for Range Management.

While the camp has evolved over time, it remains a blend of educational and recreational activities. The campers receive lectures on topics related to range science and ranch management as well as practical, hands-on, experience with range plant identification and range judging. The program includes a tour of a nearby ranch and the Nebraska National Forest. Past ranch hosts include the Reed Hamilton Ranch and the Atkins Ranch. The Reed Hamilton Ranch has been the long-time host, sponsoring the students for a tour, the Range Camp Rodeo (not involving livestock) and steak fry for more than 35 years. This year the host ranch was the Wayne and Sheryl Rodocker Ranch. The campers are also treated to a canoe/tubing trip on the Middle Loup River, a picnic-style barbecue, games, and for the first time in 2006, an opportunity to use the water slide constructed on the edge of the camp area. The week concludes on Friday with a group-conflict resolution problem and presentation of awards.

Week-long individual and group competitions are built into the camp structure. Nine Nebraska ranches provide sponsorship to the camp, allowing their brand to be used as part of the camp's group competition. The youth are divided into "ranch crews," each of which is assigned a ranch brand and an adult volunteer to act as the crew boss, who is relied upon for group training and review of current study areas. Each ranch crew selects one of its own to be the wrangler, or youth leader, of the crew. Crews are also scored for performance in recreational activities and games. Each camper is given a notebook the first day of camp with detail on the topics presented at the camp as well as multiple publications related to range plants, range management, plant physiology, and

range judging. This reference material not only assists as review for the written test, but is also a valuable resource for future study in those areas. At the end of the week, awards are given to the top ranch crew, the top ten first-year campers, and the top five returning campers. Also recognized are campers with the top plant I.D. and top range site scores from the range judging contest. These awards are usually a copy of a plant I.D. book or *An Atlas of the Sand Hills*. Additionally, the top and runner-up first-year campers receive a "Montana Silversmith's" belt buckle, and the top returning camper receives a plaque.

All of the campers are encouraged to develop a talk, using traditional or PowerPoint slides, on a subject of their own choosing that they can then present in a competition at the annual meeting of the Nebraska Section SRM. The individuals judged to have the best presentations are sponsored by the Section as Youth Forum delegates to the next International Society for Range Management Meeting. Two such Nebraska delegates attended the 2006 International SRM Meeting held in Vancouver, British Columbia.

Of course, an activity of this type requires a great deal of planning and organization, usually starting as early as February. These tasks fall primarily to the co-directors for the camp, which this year were Mary Reece, Daryl Cisney and Cindy Tusler. The efforts of the co-directors, although primarily completed within two weeks following the camp, extend until the conclusion of the International SRM Meeting the following February, which is a substantial personal commitment on their part. Also integral to the success of the camp is the participation of all of the guest presenters, sponsoring ranches, tour guides, host ranches, and particularly, the adults who act as crew bosses and/or general helpers. Most of these individuals have provided multiple-year assistance and represent the University of Nebraska-Lincoln, Natural Resources Conservation Service, Natural Resources Districts, The Nature Conservancy, U.S. Forest Service, UNL Extension, Board of Educational Lands & Funds, agricultural education instructors, working ranchers and interested college students. Volunteers this year included 11 guest presenters, a crew of 12 people to set up, run and score the judging contest, and 14 co-directors, crew bosses and other helpers, many of whom also provided educational presentations. Interestingly, many of the adult volunteers attended the camp as youths. The camp also relies on donations and grants to provide reference material and awards. Past financial supporters of the camp include the sponsoring ranches, the Nebraska Environmental Trust, the Nebraska Grazing Lands Coalition, the Sandhills Task Force, and UNL. It is important to note that **all** of the people who make the Nebraska Youth Range Camp a success each year are volunteers.

The Nebraska Section of the Society for Range Management is proud to sponsor this activity each year. The Section is also aware of, and grateful for, the time and effort provided by all the volunteers – many of whom are active Nebraska Section members – who each year help ensure a quality camp that provides both educational and recreational opportunities for the young participants.



2006 campers participate in a range judging contest.

Grassland Ecology and Management: A New Name for the Range Major

(continued from page 3)

changes have been made recently (2001) to broaden the subject matter base related to multiple uses of rangelands. A lower-level livestock course and a ranch planning course are no longer required, and courses in GPS/GIS, natural resource economics, natural resources policy, and natural resources planning have been added. These changes not only continue to meet the requirements of positions in state and federal land management agencies (e.g., NRCS, U.S. Forest Service), but bring the major in line with conservation and biologist positions in the private sector and other public sector agencies including environmental consulting, grassland/prairie management and restoration, and wildlife habitat management. These changes in the curriculum and career opportunities should be appealing to a new set of students – those from urban areas interested in plant sciences and ecology.

Broadening the scope of the range major without changing the name was not successful in reaching students outside of our traditional base. The recent name change to “Grassland Ecology and Management” is an action that will better identify the content of the major and the career opportunities for graduates of the program. To most people, rangeland is a value-laden term strictly associated with livestock grazing and production. Rangeland in the major’s name appeared to greatly reduce the size of the potential audience interested in the major. Grassland is a use-neutral term that strictly refers to a vegetation type dominated by grasses. Rangeland has a broader meaning than grassland because it includes land/vegetation types other than grasslands such as grass-shrublands, shrublands, and savannas. Nebraska’s rangelands are grasslands; therefore, changing rangeland to grassland removes the implied livestock association with the major and more clearly states the vegetation type studied. Finally, the major’s curriculum deals with both ecology and management of grasslands. This should be clearly stated in the name because this is the strength of the major and the reason why the major should be attractive to a broad set of students and prospective employers.

Students based in production agriculture and interested in grazing livestock have not been forgotten! In fact, the Grazing Livestock Systems major, first offered in 1999, was created with them in mind. The GLS major, which is coordinated by the Center for Grassland Studies, is an integration of forage and range management, animal science, and agricultural economics for students wanting expertise and a career in livestock production on range and pasture. Depending on their selection of elective courses, students in the GLS major may also qualify for government positions related to land management.

For further information on either the Grassland Ecology and Management major or the Grazing Livestock Systems major, contact Dr. Walter Schacht (wschacht@unl.edu, 402-472-0205), who works closely with and is an adviser for both majors.

CGS Associates

Spring was an important time for **Don Adams**, who not only was elected into the Nebraska Hall of Agricultural Achievement, but was also appointed Director of the West Central Research and Extension Center (he had been serving as Interim Director) and Associate Director of the Nebraska College of Technical Agriculture.

Info Tufts



Findings in a recent study on land use by the USDA Economic Research Service (see Resources) included: The most consistent trends in major uses of land (1945-2002) have been a growth in special-use and urban areas and a decline in total grazing lands. Estimated acreage of grassland pasture and range increased by almost 7 million acres (1%) from 1997 to 2002. However, total grazing land acreage (grassland pasture and range, cropland pasture, and grazed forests) decreased from 1997 to 2002, continuing a decline since the 1940s. Of the nearly 2.3 billion acres of total U.S. land area, land used for all agricultural purposes accounted for 52%, while total grazing area comprised 35% of the total and two-thirds of all agricultural land. Over 60% of U.S. land is privately owned.



Landscapes Unlimited, headquartered in Lincoln, Nebraska, is celebrating 30 years of constructing more than 700 golf and recreational spaces throughout the world, many of which have hosted prominent golf tournaments. LU Founder and CEO, Bill Kubly, was inducted into the Nebraska Business Hall of Fame earlier this year (former inductees include Warren Buffet). Bill served on the Center for Grassland Studies Citizens Advisory Council for a decade and helped support development of the Professional Golf Management (PGM) major, which is administered by the CGS. He currently serves on the PGM External Advisory Committee.



Resources

Smart Water Use on Your Farm or Ranch.

This new (2006) 16-page bulletin from the USDA Sustainable Agriculture Research and Education (SARE) program spotlights innovative, SARE-funded research into a range of conservation options including: soil management, such as using compost, conservation tillage and cover crops; plant management, featuring crop rotation, water-conserving plants and rangeland drought mitigation; and water management strategies such as low-volume irrigation and water recycling. Preview or download the entire publication at www.sare.org/publications/water.htm. To order free print copies, visit www.sare.org/webstore, call 301-504-5236, or e-mail san_assoc@sare.org (provide publication title, your name, shipping address, and telephone number when placing your order). Agricultural educators may place orders for print copies in quantity for conferences, workshops or other events.

Strategies for Range Beef Cattle Producers in Arid Environments Following Drought. NebFact addresses how to deal with an inadequate supply of forage for range beef cattle because of drought. Available from UNL Extension, www.ianrpubs.unl.edu/epublic/live/nf584/build/nf584.pdf.

Major Uses of Land in the United States, 2002. This May 2006 report from the USDA Economic Research Service presents the results of the latest (2002) inventory of U.S. major land uses, drawing on data from the Census, public land management and conservation agencies, and other sources. The data are synthesized by state to calculate the use of several broad classes and subclasses of agricultural and nonagricultural land over time. It is available at www.ers.usda.gov/Publications/EIB14.

Wildflowers and Grasses of Kansas: A Field Guide. Published in 2005 and written and photographed by agricultural librarian Michael John Haddock, this book contains color photographs and descriptions of 323 plant species, many of which also occur in states surrounding Kansas. Where close-up photos of the flowers have been used, the author has provided a good description to allow the reader to gain an understanding of the overall size and growth form of the plant. In some cases, secondary illustrations

are included to portray unique characteristics of the plant that will aid in identification. Each entry for flower or grass includes scientific name, family, common name(s), flowering period, height, distribution and habitat, life span, basic morphological characteristics, and notes on historical food and medicinal uses where applicable. It is available in many bookstores and via online book sellers. For additional information about the book, see www.kansaspress.ku.edu/hadwil.html.

Kansas Wildflowers and Grasses web site, www.lib.ksu.edu/wildflower. Also authored by Mike Haddock, this site contains information and more than 1800 identification photos for some 450 species of forbs, grasses, sedges, rushes, and woody plants that are found growing in Kansas. The photographs may be used for educational purposes.

The Southeast Agricultural Research Center of Kansas State University has issued its 2006 progress report. It contains many articles on research results of potential interest to our readers, including those in the categories of beef cattle, forage crops, and soil and water management. See www.oznet.ksu.edu/library/crpsl2/SRP960.pdf.

Calendar

Contact CGS for more information on these upcoming events:

2006

- | | |
|-------------------|--|
| Aug. 7-8 | 2006 Nebraska Grazing Conference, Kearney, NE, www.grassland.unl.edu/grazeconf.htm |
| Oct. 11-13 | Managing Agricultural Landscapes (organized by the Soil and Water Conservation Society), Kansas City, MO, www.swcs.org/en/swcs_international_conferences |
| Nov. 12-16 | ASA-CSSA-SSSA International Meetings, Indianapolis, IN, www.agronomy.org/meetings.html |
| Dec. 10-13 | 3rd National Conference on Grazing Lands, St Louis, MO, www.glci.org/3NCGLIndex.htm |

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