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Center for Grassland Studies

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Examining the Roles of Plant Species and Nitrogen in the Structure and Function of Microbial Communities

by Kate Bradley, Rhae Drijber and Johannes Knops, UNL

Global environmental problems such as increased atmospheric carbon dioxide and declining species diversity constantly make media headlines. A related problem, which we tend to hear less about, is the change in the global nitrogen cycle due to human activities. Nitrogen is an important nutrient resource for plants and animals, including the crops we grow. However, it is in limited supply because most of the nitrogen on Earth is in a gaseous form, so most organisms cannot use it in that form. It has to be converted into useable forms such as ammonia and nitrate by nitrogen-fixing bacteria and lightening strikes, respectively. Major sources of human-produced nitrogen include synthetic fertilizers, the biological fixation of nitrogen by legume crops such as soybeans and clover, and car emissions. Through these activities, humans have essentially doubled natural input rates of nitrogen, thereby offsetting the balance between nitrogen inputs and the uptake of nitrogen by living organisms. Forms of nitrogen not taken up by living organisms can be lost through leaching, runoff, or volatilization.

High species diversity when no fertilizer is used.

Low species diversity at highest fertilization rate.

This more mobile, excess nitrogen has serious ecological implications for many areas of the Earth. These include acidification of both soils and the waters of streams and lakes, increased transport of nitrogen by rivers into estuaries and coastal waters where it is a major pollutant, and increased nitrate levels in the ground water of agricultural regions, which can pose threats to human health. Increasing the supply of nitrogen (supply rate) makes it easier for weedy, often exotic species to become established, and has also been shown to decrease local plant diversity.

The consequence of changing or losing species is a topic of much current research. Most studies looking at changes in ecosystem processes have focused on the impact of manipulating plant species diversity while ignoring potential feedbacks or changes in soil microbial communities. Soil microbes control nitrogen supply to a large extent. Plants supply microbes with carbon as their primary energy source, while plant growth is limited by nitrogen supply. Recent work on individual plant species has demonstrated that plants can strongly influence both soil functions such as nitrification (the transformation of ammonia to nitrate) and nitrogen mineralization (the net release of nitrogen into the soil) as well as the composition of soil microbial communities (bacteria and fungi) beneath them. The type and amount of fertilizers applied also have been shown to change microbial communities and their

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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
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Anne Moore ..... Newsletter Layout

From the Director

We, in Nebraska, are experiencing one of the most severe droughts in recent times. Drought is defined in the dictionary as a long period of abnormally low rainfall that adversely affects growing or living conditions. We can all relate to that definition with the widespread impact our current drought is having. The drought in 2002 has been even more severe because of the near-record high temperatures that we have also experienced.

Nebraska is fortunate to have an excellent supply of underground water stored in the Ogallala aquifer, but this is concentrated underneath the Sandhills and not uniformly distributed throughout the state. Also, surface water, which is our most visible source, is not only influenced by rainfall in Nebraska, but by rain and snow falling upstream in the Colorado and Wyoming mountains and later flowing in Nebraska's streams and rivers. Some of these streams have been dry or had little water flowing this year.

Many individuals have asked what happens to the grass plants under these kinds of drought conditions. There are numerous physiological and anatomical changes that occur. First, we see a slowing of physiological processes and thus a slowing of growth. Prolonged moisture stress will cause the leaves to droop, roll or wilt, and change to a blue-green color. Then shoot growth may cease and the plant becomes dormant. The leaves may die, but the buds in the crown, rhizomes and stolons normally survive and will initiate new growth when the soil moisture is replenished. Most perennial grasses are able to survive periods of drought if the plants have matured, have good root systems, and are healthy going into the drought. On the other hand, annual plants usually fare less well primarily because of their shallow root system.

Some species of grasses and cultivars within species have a greater tolerance for drought, which is normally related to physiological characteristics, anatomical structure and growth habit. When selecting a grass, one should consider both the distribution and total amount of moisture received throughout the year. This practice is only applicable if you have not established your stand previously.

Certain plants have one or more of the following structural modifications to cope with moisture stress: fewer stomata, increased cuticle thickness, the presence of hairs on leaf surfaces. Still other means, such as closing of the stomata, rolling of leaves or storing water in the roots, are utilized by a group of plants. Careful selection of species of plants and cultivars can be helpful in planning for potential drought conditions.

There are practices that can be employed to lessen the negative impact of drought on grass plants. One of the things we should avoid is cutting or grazing the plants too short. By leaving leaf surface area on the plant, it provides shade, thus keeping the temperature of the crowns lower, cuts down on evapotranspiration, and provides leaf area for the manufacture of food. When the plant has an adequate food supply, the root system will grow and be more extensive, thus reaching a larger soil area from which it can extract water.

After plants have experienced a period of drought, they should be given ample time for recovery before grazing or mowing intensively. The recovery period should be long enough for the plants to have adequate time for the manufacture and storage of food reserves.

M. A. Massengale

Carcass and Palatability Characteristics of Calf-fed and Yearling Finished Steers

by Perry Brewer, Rosemary Anderson, Chris Calkins, Terry Klopfenstein, and Rick Rasby, UNL

Introduction

An intensive method of finishing cattle consists of calves entering a feedlot post-weaning, where cattle are fed a high-concentrate diet ad libitum, to optimize time on feed. These calves are commonly finished and slaughtered at 12-15 months of age and are termed calf-feds. Some extensive management systems include finishing cattle solely on grass or forage, while others include both forage and grain feeding. Cattle that are fed forage before entering the feedlot are slightly older and commonly finished as yearlings. However, meat becomes less tender as the chronological age of an animal increases. Implementing grazing into a beef production system increases utilization of forage, thus decreasing costs associated with drylot feeding and the length of time necessary in the feedlot. Literature suggests cattle on feed for as few as 90 days may have similar palatability traits as cattle fed for longer periods of time.

Cooler aging is a common method used to produce a more tender beef product. Aging beef allows naturally-occurring enzymes in the muscle to function, thus producing a more tender cut of meat.

The objective of this study was to compare differences in carcass traits and palatability characteristics in calf-fed versus yearling steers.

Procedure

Seventy-six crossbred steers were evaluated in two management systems. All calves were weaned and the steers were separated into the two treatments. Thirty-four steers were finished as calf-feds and 42 as yearlings. Calf-fed steers entered the feedlot with a 28-day receiving period, followed by a five-week period of increasing concentrate formula up to 90% concentrate (12% CP). These steers were given ad libitum access for 203 days. Yearling steers were drylotted for 60 days until corn stalks were available for grazing. Corn stalks were grazed for 78 days, followed by a 64-day period in the drylot. Spring and summer grasses were then grazed for 96 days before a 93-day finishing period in the feedlot with the same feeding formula received by calf-fed steers. Calf-fed and yearling steers were fed to a target fat thickness endpoint of 0.5 inch at the 12th rib.

The cattle were harvested in a commercial packing plant and the carcasses were chilled. At 48 hours post-mortem, carcass data for yield and USDA quality grades were collected. Wholesale loins from the left side of each carcass were collected and transported to the University of Nebraska Meat Laboratory.

At seven days post-mortem, one steak was removed from the 13th rib area and was frozen for proximate analysis. The remaining portion of each loin was then fabricated into one-inch-thick steaks for Warner-Bratzler shear force determinations and evaluation by a consumer sensory taste panel. Steaks for shear force were classified into aging treatments of 7, 14, and 21 days. Steaks for consumer sensory taste panel were aged for 7 and 14 days. All steaks were vacuum-packaged and frozen until used for further testing.

For consumer taste panel determination, three or four steaks were thawed and broiled on Farberware Open-Hearth Broilers to a final internal temperature of 158^{o}F. Immediately after cooking, each steak was sectioned into 1/2" x 1/2" x 1" portions and kept warm in double-boiler units. A consumer sensory taste panel averaging 29 members (range: 21-42) evaluated eight samples, two for each of the four treatments, for 19 consecutive sessions. Juiciness, tenderness, flavor, and overall acceptability were rated using an eight-point descriptive scale (8 = extremely desirable, 1 = extremely undesirable). Steaks for Warner-Bratzler shear force measurement were cooked using the same method as those for the taste panel. After cooling to room temperature, a minimum of six 1/2" cores were removed and sheared in the center with the Warner-Bratzler shear attachment to an Instron Universal Testing Machine.

Shear force values were used to classify steaks as being "tough," "intermediate" or "tender." "Tough" steaks were distinguished as having greater than 10 lbs of shear force, "intermediate" steaks having from 8.5 to 10 lbs, and "tender" steaks having less than 8.5 lbs of shear force.

Results

During the finishing phase, calf-fed steers averaged 211 days on feed and yearlings averaged 90 (Table 1). Calf-fed steers had lower ADG compared to yearlings and feed conversion was better. Final weights were greater for yearlings. Growing steers for a longer period of time on forage before a short finishing period resulted in poorer feed conversion, leaner, heavier carcasses and more carcass weight marketed per cow. Because more product is marketed, there is greater potential for profit if costs are equal to or less than the costs incurred in the calf-fed system. The amount of concentrate (grain and byproduct) needed to produce one pound of finished animal decreased from 2.83 lbs for calf-feds to 1.6 lbs for yearlings.

Palatability and shear force values were analyzed using marbling score as a covariant (Table 2). This enabled us to

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compare calf-fed and yearling steers at an equivalent marbling score. Sensory tenderness ratings were higher ($P < 0.01$) for calf-fed steers at 7 and 14 days aging. Overall acceptability ratings were also higher for calf-fed steers at 7 ($P < 0.05$) and 14 ($P < 0.10$) days of post-mortem aging. Flavor differences were not significant at equal marbling scores. Shear force means were lower ($P < 0.01$) for calf-fed steers at 7, 14, and 21 days of aging.

The percentage of animals being classified into the "tough" category was observed using the shear force values at these aging times. No calf-fed steers were classified as "tough" in this study. However, 19%, 11.9%, and 4.8% of yearling steers were classified as "tough" at 7, 14, and 21 days of aging, respectively. Post-mortem aging showed a more significant effect on yearling cattle; however, steaks from calf-fed steers were unusually tender in this study. Although the risk of finding a "tough" loin steak was higher for yearling-finished steers than for calf-feds, the frequency was relatively low, especially with extended aging times.

Table 1. Calf-fed and Yearling Performance[a]

	Calf-fed	*Yearling*
Days on feed	211	90
Winter gain, lb/d	—	1.16
Summer gain, lb/d	—	2.06
Feedlot gain, lb/d	3.31[b]	4.31[c]
Feed conversion	5.78[b]	7.29[c]
Final weight, lb	1193[b]	1364[c]

[a]Summary of three years data.
[b,c]Means differ (P<.01).

Table 2. Palatability traits and shear force values for loin steaks aged 7, 14, and 21 days from calf-fed and yearling steers adjusted to a constant marbling score

		Calf-feds		*Yearlings*	
Age	*Trait*[a]	*Mean*	*SE*	*Mean*	*SE*
7 day					
	Juiciness	5.07	0.09	5.07	0.08
	Tenderness	5.50[b]	0.10	4.92[c]	0.09
	Flavor	4.84	0.07	4.77	0.06
	Overall acceptability	4.97[b]	0.08	4.71[c]	0.07
	Shear force, lb	6.37[b]	0.24	8.20[c]	0.21
14 day					
	Juiciness	4.82	0.09	4.80	0.08
	Tenderness	5.53[b]	0.09	4.99[c]	0.09
	Flavor	4.89	0.06	4.81	0.06
	Overall acceptability	4.92[d]	0.08	4.71[e]	0.07
	Shear force, lb	5.93[b]	0.23	7.56[c]	0.21
21 day					
	Shear force, lb	5.67[b]	0.23	6.99[c]	0.21

[a]Means based on an eight-point scale (8 = extremely desirable, 7 = very desirable, 6 = moderately desirable, 5 = slightly desirable, 4 = slightly undesirable, 3 = moderately undesirable, 2 = very undesirable, 1 = extremely undesirable).
[b,c]Means on the same row without a common superscript are different ($P < 0.05$)
[d,e]Means on the same row without a common superscript are different ($P < 0.10$)

Editor's Notes: Perry Brewer is a current graduate student, Rosemary Anderson is a former graduate student, and Chris Calkins, Terry Klopfenstein and Rick Rasby are faculty members in the Department of Animal Science. This research was supported in part by the NC-225 regional project, "Improved Grazing Systems for Beef Cattle Production," funded by USDA.

Nebraska Partnership for All-Bird Conservation Formed

Increasing trends nationally in bird conservation needs, awareness, and funding have catalyzed the formation of the Nebraska Partnership for All-Bird Conservation. By building a statewide partnership among diverse organizations and agencies with some interest in bird conservation, the NPABC will be able to do the following:

- Focus planning efforts to reflect needs, priorities, and opportunities within Nebraska.
- Generate synergy among conservation efforts at the local level so that they can achieve more and work on a larger scale than they could otherwise.
- Attract funding to support local activities and initiatives, and better prepare participants for taking advantage of funding opportunities as they arise.
- Provide a forum for partners to learn about each other's missions and capabilities, and thereby find common ground for working together.
- Serve as a clearinghouse for sharing tools, ideas, and lessons learned among local partnerships.
- Funnel project ideas, lessons learned, and technical expertise from bird conservation programs outside the state to local initiatives within Nebraska.
- Create a more unified and stronger political voice for conserving birds in Nebraska.
- Educate a broader public, including fellow professionals, about the needs and opportunities for bird conservation in the state.
- Broaden the impact of bird conservation activities and garner wider public support through habitat-directed local partnerships.
- Coordinate local initiatives with regional (e.g. joint venture) initiatives.

The mission statement of the NPABC, which was formed this summer, is: A Nebraska Partnership for All-Bird Conservation will promote a coordinated, science-based, landscape approach to voluntary land stewardship that will conserve, improve, and expand habitat for all bird species within sustainable rural communities. An ecosystem-based approach will be supported through partnerships unified by a common need for communication, education, and a broader appreciation for the diversity of bird habitats and associated bird species within Nebraska.

The following organizations are represented on the NPABC Steering Committee: Audubon Nebraska, Ducks

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Examining the Roles of Plant Species and Nitrogen in the Structure and Function of Microbial Communities (continued from page 1)

functioning. Changes in soil microbial communities are likely to influence soil processes, because soil microorganisms are considered the key regulators of decomposition (breakdown of dead organisms) and nitrogen cycling.

In our work, we are trying to understand how increased nitrogen availability influences microbial communities, and how this may influence plant diversity. Our plant species include the common tallgrass prairie grasses Big Bluestem and Little Bluestem, the non-native Brome grass and the native legume Lupine. To look at effects of nitrogen fertilization, we have sampled prairie plots that have been fertilized with nitrogen for more than 20 years. At the lowest fertilization rate (no nitrogen), species diversity remains high (see first picture on cover). At the highest fertilization rate, plots once dominated by native, warm-season grasses have shifted to mixtures lower in diversity and are now dominated by cool-species grasses (see second picture).

We have preliminary results demonstrating that soil microbial communities (Figure 1) differ under different species as well as under different levels of nitrogen fertilization. Additionally, chronic nitrogen inputs from both human and natural sources (***Lupinus perennis***-a legume) have lead to convergent soil microbial communities, though the dominant plant species differ dramatically. Our hypothesis is that microbial communities change in response to nitrogen fertilization, and that changes in the microbial community will influence the supply rate of nitrogen. We already know that altered nitrogen supply rates influence plant diversity, so we predict that different microbial communities will foster establishment of different plant species.

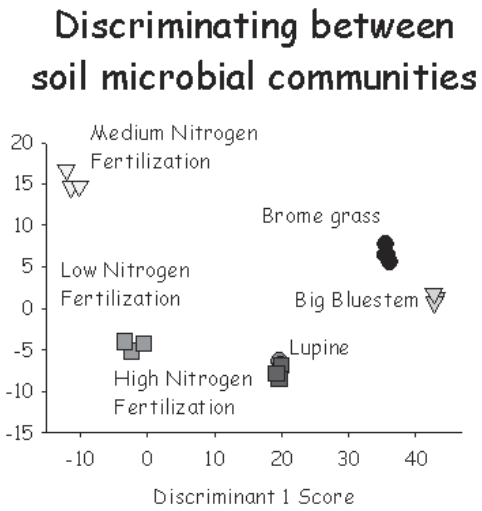

Figure 1. Soil Microbial Communities under different long-term nitrogen addition treatments and under different plant species. This statistical analysis was done on the fatty acids extracted from microbial cells within the soil. The fatty acids from the different species and nitrogen treatments clustered into distinct groups that are statistically different from each other at $p < 0.001$. Different kinds of microbes have different kinds of fatty acids that are unique to them, so the clustering of the fatty acid profiles indicate that the soil communities associated with each treatment are different. Note however, that the fatty acid profiles for Lupine and the High Nitrogen treatment fall on top of each other, suggesting their soil communities are very much the same. Discriminant 1 explains 92% of the variability in the fatty acids. Discriminant 2 explains 5% of the variability in the fatty acids.

Editor's Notes: Kate Bradley is a graduate student and Johannes Knops is a faculty member in the School of Biological Sciences, and Rhae Drijber is a faculty member in the Department of Agronomy and Horticulture.

Integrating Forage and Cattle Resources to Maximize Profitability of Beef Enterprises Conferences

Extension Specialists from nine states are teaming up to provide a conference series this fall on maximizing forage resources and cow-calf profitability. The sessions feature keynote presentations on evaluating production and economic changes within the cow-calf operation, drought management strategies, managing year-round forage supplies, implementation of forage and herd management practices and profit optimization of these beef systems practices. Besides the keynote presentations, each program will also feature breakout sessions highlighting topics of local interest on grazing and cattle management and a producer panel. A meal is included at each session.

Keynote speakers for each of the four sessions are Don Adams, Dick Clark, Pat Reece and Terry Klopfenstein, all from the University of Nebraska, and Jim Gerrish from the University of Missouri.

The time and locations of the four sessions are:

November 19, 2002, 9 am — 4 pm, Best Western Doublewood Inn, Bismark, ND

November 21, 2002, 9 am — 4 pm, Chadron State College, Chadron, NE

December 3, 2002, 3 pm — 9 pm, The Mark of the Quad Cities, Moline, IL

Thursday, December 5, 2002, 3 pm — 9 pm, Ramada Inn, St. Joseph, MO

The conferences are sponsored by the NC-225 "Improved Grazing Systems for Beef Cattle Production" regional project, the Northern Integrated Resource Management Group, and the National Cattlemen's Beef Association.

For more information, contact Renee Lloyd, NCBA, 303-850-3373, rlloyd@beef.org.

New Grasslands Plan Holds Promise for People, Wildlife, and Public Lands

U.S. Forest Service (USFS) officials signed Records of Decision (ROD) on the new management plans for the Ogalala National Grassland, the McKelvie National Forest and the Nebraska National Forest, as well as other National Grasslands in North Dakota, South Dakota and Wyoming on August 1.

These new plans are long-awaited "blueprints" for the administration of more than 2.4 million acres of federal public lands that provide key habitat for vanishing prairie wildlife.

"We are pleased to see these long-delayed plans finally move forward so that much-needed management changes can begin to take place on these abused lands," said Catherine Johnson, National Wildlife Federation's Grasslands Program Manager.

"The plan will improve hunting and wildlife watching, benefit local communities that depend on recreation and tourism revenue, safeguard threatened wildlife species, and begin to repair this unique part of Nebraska's natural heritage," said Duane Hovorka, Nebraska Wildlife Federation Executive Director.

At stake are the scattered remnants of America's dwindling prairie grasslands, North America's most endangered ecosystem. Unless these vital habitats are restored, many prairie wildlife species such as the burrowing owl, mountain plover, and black-tailed prairie dog may soon be listed under the Endangered Species Act. Sharp-tailed grouse populations and other prairie birds are also facing downward trends.

Covered by the plan are 351,000 acres in Nebraska, including Oglala National Grassland, Sam McKelvie National Forest, and the Nebraska National Forests at Pine Ridge and Halsey. Together, they represent 44% of the 800,000 acres of publicly-owned land available for hunting and fishing in Nebraska, so their management is vitally important to Nebraskans.

The National Grasslands are federally-owned lands that could serve as bastions of wildlife habitat for imperiled species. Unfortunately, much of the National Grasslands have been badly damaged by overgrazing and poorly planned oil and gas development.

While the details of the plan signed weren't immediately available, National Wildlife Federation (NWF) sources say the new plans for these federal public lands in Nebraska contain key elements for building and maintaining wildlife and habitat, including:

- Creating a greater diversity of grass and shrub heights and densities, providing forage for wildlife and nesting cover for sharp-tailed grouse and prairie chickens, possibly leading to increased populations of these game birds;
- Providing increased management attention to "riparian" areas, the lush areas along streams that provide key habitat for wildlife species including migratory songbirds;
- Expanding black-tailed prairie dog colonies, a keystone species of the Nebraska prairie that supports and attracts a number of native species such as the ferruginous hawk, swift fox and burrowing owl; and
- Providing for the reintroduction of bighorn sheep in the Pine Ridge area.

"While this plan represents solid progress toward managing these public lands to benefit all citizens," said NWF's Johnson, "the true test is whether or not this plan is implemented on the ground. We'll continue to work with the U.S. Forest Service and all those concerned about the health of our grasslands to make sure this plan is followed."

Johnson and Hovorka stress that the grasslands management plans as a whole could be even stronger. They note that the National Wildlife Federation and the Nebraska Wildlife Federation (NEWF) have urged the Forest Service throughout the nearly five-year public planning process to include strong, measurable standards for the regeneration of woody draws and riparian areas.

In January, NEWF asked NEWF members and area hunters to voice their support for a strong management plan, and many responded.

"The new plan isn't perfect, but it is a solid step forward in managing these publicly-owned lands in a way that provides benefits for people and wildlife," said Hovorka.

Editor's Notes: This article is reprinted with permission from the August 2002 issue of ***The Prairie Blade*** published by the Nebraska Wildlife Federation. Duane Hovorka is a member of the Center for Grassland Studies Citizens Advisory Council.

Tracking Movement of Cattle with Satellites

When you buy a new car, the salesperson will not only ask if you want a compact disc player and moon roof, but may also ask if you want OnStar or a similar product. These special features use Global Positioning Systems (GPS) technology to track your car anywhere in the world and can give you directions if you are lost. Similar technology is being used to track cattle. Previously, the only way to see where cattle roam was to have people watch them, which is expensive. Researchers want to know why cattle travel where they do. A better understanding of grazing behavior will allow managers to disperse cattle more effectively. Livestock distribution is a major issue for ranchers, and GPS technology is the first tool to allow researchers to learn why cattle make the choices they do about where to graze.

Agricultural Research Service rangeland scientist Dave Ganskopp at the Eastern Oregon Agricultural Research Center, Burns, Oregon, has attached collars with special radio receivers to a dozen cattle. These units receive informa-

tion from a constellation of 24 to 30 satellites that may be working at any one time. Using the coordinates of these satellites, researchers can determine within a few meters where a cow was and at what time it was there. Not only do the GPS units track where the cattle roam, they also monitor head movements, thus indicating whether the cattle are eating, sleeping, or just walking.

Once he gets the information from the collars, Ganskopp puts the data in a computer and uses Geographic Information Systems (GIS) to understand and visualize the environment the cattle were in. With his results, Ganskopp will develop computer software to determine what the cattle will do in various situations. "Eventually, I hope to predict where they will roam and forage," he says.

Currently, cattle use only 30 to 50 percent of their pastures. Scientists know some of the reasons for this, but they want to learn more. They know cattle like to stay within a mile of water and prefer level land; that is, they tend to stay on land with a slope of less than 20 percent. Cattle also enjoy fresh grass with no dead stems in it, and they like land with few rocks.

"I am trying to find ways to get animals to disperse and use all the area for grazing," says Ganskopp. His study, in its second year, will also try to answer "what-if" questions generated by modifying the range with features such as fences, water, trails, or prescribed burns.

Other ARS scientists are using GPS in related research, such as those in New Mexico who "tell" cattle where to roam (see "The Cyber Cow Whisperer and His Virtual Fence," ***Agricultural Researc***h, November 2000) and instruct farmers on where to place fertilizer (see "GPS Helps Put Manure Where It Counts," ***Agricultural Research***, June 1998).

Editor's Note: This article is reprinted from ***Agricultural Research*** magazine, August 2002, published by USDA-ARS. Online article is at www.ars.usda.gov/is/AR/archive/aug02/cattle0802.htm.

Nebraska Partnership for All-Bird Conservation Formed (continued from page 4)

Unlimited, Natural Resource Conservation Service, Nature Conservancy Nebraska, Nebraska Association of Resource Districts, Nebraska Cattlemen, Nebraska Corngrowers, Nebraska Game and Parks Commission, Nebraska Ornithologists' Union, Pheasants Forever, Platte River Basin Environments, Inc., Platte River Whooping Crane Trust, Rainwater Basin Joint Venture, Sandhills Task Force, U.S. Fish and Wildlife Service.

Editor's Notes: The above information was taken from the September 2002 ***Update on NEBRASKA PARTNERSHIP FOR ALL-BIRD CONSERVATION***. Updates will be e-mailed to interested persons approximately once a month. If interested in receiving the updates, send an e-mail to jboner@ngpc.state.ne.us. To become involved or just find out more about the Partnership, contact Jim Douglas with the Nebraska Game and Parks Commission, 402-471-5411, jdouglas@ngpc.state.ne.us.

2nd Nebraska Grazing Conference Another Winner

About 235 people from several states gathered in Kearney, Nebraska August 12-13 for the 2002 Nebraska Grazing Conference. As was the case last year, the verbal comments at the conference as well as the written evaluations indicate it was another successful event.

Dave Pratt with Ranch Management Consultants in California uses audience members to demonstrate the benefit to soil of hoof action from grazing.

New York chef Gaspar Tartanian cooks steaks from Nebraska-raised grass-fed beef for the Monday evening banquet.

Scientists, extension specialists, government employees, consultants and farmers/ranchers addressed: nutrition and consumer acceptance of grass-fed products; good and bad decisions made in growing and marketing grass-fed bison, beef, poultry, and milk; choosing the best cows and bulls for your grazing enterprise; how understanding the ecosystem

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Senator Chuck Hagel kicks off the 2002 Nebraska Grazing Conference by talking about the recently passed Farm Bill and the importance of vital rural economies.

can help make your grazing lands more productive and profitable; controlling cedar trees; how grazing is one of the tools used to manage Spring Creek Prairie to achieve the multiple goals of increasing the diversity of native species and decreasing exotic and invasive species; marketing outlook for cattle; and much more!

Proceedings from the 2002 ($10) and 2001 ($5) are still available. They contain the material submitted by most of the presenters prior to the conferences. The CGS Web site, www.grassland.unl.edu, contains the programs for each conference. To order the Proceedings, send a check payable to University of Nebraska to the CGS office. (For orders outside the U.S., check with the Center on cost prior to ordering.)

If you were not able to attend either conference but would like to be on the mailing list to receive notice of future grazing conferences, simply send your name and address to the CGS. As information about the next conference becomes available, it will be put on the CGS Web site.

CGS Associates

This summer ***Gary Stauffer*** received a Distinguished Service Award at the annual meeting of the National Association of County Agricultural Agents.

Lowell Moser was elected President of the American Society of Agronomy. He assumes the office of President-Elect at the annual meeting in November.

CGS Associate Mike Kelly and his wife Cynthia were recently honored by the National Cattlemen's Beef Association with its Environmental Stewardship Award. Some of the conservation work they have done on their rangeland was described in last month's issue of this newsletter.

Calendar

Contact CGS for more information on these upcoming events:

2002

Nov. 19/21:	Forage and Beef Conference, Bismarck, SD/Chadron, NE
Dec. 3/5:	Forage and Beef Conference, Moline, IL/St. Joseph, MO

2003

Jan. 6-8:	Nebraska Turfgrass Conference, Omaha, NE
Jul. 26-30:	Annual Meeting of the Soil and Water Conservation Society, Spokane, WA, www.swcs.org

If you have articles, events, resources, CGS Associate News, or other items you would like to submit for inclusion in future issues of this newsletter, please contact the editor, Pam Murray, at the CGS office.

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