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December 2004

Center for Grassland Studies Newsletter, Winter 2004, Volume 10, No. 1

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Matching Beef Cattle Genetics to Feed Resources

by Jim Gosey, Department of Animal Science, UNL

Nebraska range and pasture conditions vary substantially by year and location, so matching the biological type of cow to available feed resources is a key element of biological efficiency, sustainability and profit. Since feed resources account for a major share of input costs, finding the optimum "match" between cattle genetics and economically available feed resources is a key driver of profit.

Biological Type of Beef Cow

Biological type can be used to describe similar types of cows according to mature size, growth rate, milk production, lean growth and reproductive traits.

Relative differences in these traits for a large number of breeds have been evaluated at the U.S. Department of Agriculture's Meat Animal Research Center (MARC) in Clay Center, Nebraska. It is apparent from this research that no single breed or biological type of cattle is perfect; rather, each breed has strengths and weaknesses.

Impact of Size and Milk Production on Efficiency

Maintenance of body weight accounts for nearly 75% of the total annual energy requirement of a beef cow and over 50% of the energy requirement of market cattle. Generally, energy needs for maintenance are proportional to metabolic body weight (body wt. raised to the $\frac{3}{4}$ power). However, MARC scientists Calvin Ferrell and Tom Jenkins reported this relationship did not accurately predict maintenance for four breed types of cows that differed in milk production.

Angus x Hereford crosses (AHX), Charolais crosses (CX), Jersey crosses (JX) and Simmental cross cows (SX) represented four biological types of cows, with respect to size and milk level. Ferrell and Jenkins reported daily maintenance requirements to be 4%, 12% and 24% higher

for CX, JX and SX cows, respectively, as compared to AHX cows. Cows having higher milk production potential had higher maintenance requirements per unit of metabolic body size. The energy requirements of higher milking cows are greater even during the dry period because of larger organ size (liver, heart, lung). Size, by itself, had little influence on maintenance requirements when expressed per unit of metabolic weight. Total annual energy requirements of the CX, JX and SX cows were 11%, 4% and 30% greater, respectively, than the AHX cows.



Intermediate Biological Types Usually Best

Under drier range conditions, intermediate biological types of cows are usually the most productive. An example is the research conducted by Don Kress at Montana State University's Northern Agricultural Research Center near Havre.

Five biological types of cows were evaluated: straightbred Hereford, HH; Angus x Hereford, AH; 25% Simmental x 75% Hereford, 1S3H; 50% Simmental x 50% Hereford, 1S1H; 75% Simmental x 25% Hereford, 3S1H. Calf weaning weight increased as cow size and milk production increased, but calf weaning weight was not a good measure of cow productivity, as indicated by calf weaning weight per cow exposed to breeding. However, based on this measure of cow productivity, an intermediate biological cow type (1S1H) was the most productive. Calf weaning weight per cow exposed to breeding was a good indicator of profit, and crossbred cows of intermediate biological types were consistently the most profitable.

Are intermediate cow biological types always most productive? Probably not, according to research conducted by Mike MacNeil at the Livestock and Range Research Laboratory (LARRL) near Miles City, Montana. LARRL represents a sparse feed resource area with shortgrass

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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

In early December of 2003, I attended the Second National Conference on Grazing Lands in Nashville, Tennessee, sponsored by the Grazing Lands Conservation Initiative (GLCI) and the Society for Range Management (SRM). The GLCI is an organization that was formed in 1991 to improve and/or maintain the nation's grazing lands, both public and private.

The GLCI is basically a "grass roots" organization supported heavily by the United States Department of Agriculture's Natural Resources Conservation Service (NRCS). Many states have a GLCI component, which in our state is the Nebraska Grazing Lands Coalition (NGLC), of which Roger Chesley of Callaway is the coordinator and Ross Garwood of Amelia is the chair. The Center for Grassland Studies has a close working relationship with the NGLC.

GLCI brings together people from many different professions and backgrounds including agricultural producers, conservationists, graziers, environmentalists, academicians and others with an interest in grazing lands. The organization emphasizes technical assistance, expanded research and education for grazing lands, and a more knowledgeable and better informed public.

The GLCI is directed by a National Steering Committee representing some 15 different agencies and organizations. I represent the American Society of Agronomy as one of the cooperating organizations. The GLCI was formed at a meeting of representatives from these organizations because it was believed that NRCS resources had been diverted from grazing lands to conservation compliance and other programs established in the 1985 Farm Bill.

The 2003 National Conference on Grazing Lands had about 1200 individuals in attendance. The program treated a variety of topics including forage quality, extending the grazing season, economics of grazing, management techniques, invasive species, burning, carbon sequestration, agricultural and urban partnerships, sustainable rangelands-sustainable grazing, policy implications and effects, grazing lands health, biodiversity, managing riparian vegetation, silva pasture, and grass-fed beef. Several Nebraskans presented excellent papers and moderated sessions. There will be a proceedings published in late spring or early summer. For a copy of the program and other conference information, see www.glci.org/2NCGLindex.htm.

The Grazing Lands Conservation Initiative is an important effort on behalf of the nation's grasslands. These grasslands, which cover more than half of our land surface area, are critically important to our ecosystem from many different aspects, and they need to be properly managed and handled.

M. A. Massengale

Ecological Monitoring to Assist Producers with Grassland Production Forecasts

by George Green, School of Natural Resources, UNL

In the spring of 2005, grassland managers in the central Great Plains should face the growing season armed with a new type of production forecast, thanks to the interstate Grasslands Ecological Monitoring System (GEMS).

A \$608,000 grant from the USDA's Risk Management Agency fuels the project that Walter Schacht of the Department of Agronomy and Horticulture and Geoffrey Henebry of the School of Natural Resources co-direct.

GEMS will integrate climate, terrain, and soils data with current information on weather and soil moisture into a model that aims to predict the amount of grassland production expected during a growing season, Henebry said.

"We are combining new analyses of historical climate data with several kinds of current data to present integrated information in a form useful to producers," he said.

Reliable projections from GEMS may eventually allow the USDA Risk Management Agency to develop insurance products for grasslands, similar to the way it currently insures croplands, Schacht said. And, he said, dependable GEMS forecasts would greatly assist forage managers with making management decisions.

"Our audience goes all the way from the federal agency to the producer," Schacht said.

A GEMS website will dispense data summaries, analyses, and forecasts for free, Schacht said.

To spur rapid dissemination and use of the information, Schacht said, GEMS researchers will host regional workshops across Nebraska, Kansas and South Dakota, the states that GEMS monitors. These forums will introduce producers, extension educators and federal agency staff to the system and teach them how to navigate through the wide range of information it provides.

The regional scale of GEMS brings together researcher from the University of Nebraska-

Lincoln, Kansas State University, Ft. Hays (Kan.) State University, South Dakota State University, and the U.S. Forest Service as well as staff at the Risk Management Agency.

To begin crafting an effective model of grassland productivity, Henebry said, he has begun a retrospective analysis of long-term weather data from key weather stations across the Great Plains.

"Climate is the expected weather based on many years of observation at a particular place," he said.

Henebry said he is aiming to identify a handful of "climatic regimes" from the mass of historical weather data. These regimes will correspond to particular weather patterns involving temperature and precipitation during the growing season that will have significantly different influences on vegetation growth and development, he said.

Regional diversity in plant communities across the GEMS states demand that researchers calibrate the model's calculations to each region's type of vegetation, such tallgrass, shortgrass, mixed-grass, or Sandhills prairie, he said.

Part of the retrospective analysis involves analyzing for the effects of long-distance atmospheric linkages known as "teleconnections like the widely-known El Niño/Southern Oscillation or the North Atlantic Oscillation, Henebry said. These patterns of sea surface temperature and atmospheric pressure can affect weather on the other side of the planet.

Eventually, he added, researchers intend to feed recent data into the model to determine if it can produce accurate forecasts based on a complex analysis of current and recent conditions and a review of historical records.

The researchers plan to conclude all analyses and have the model online by April of 2005, he said.

Fed by various data sources, including spaceborne surface soil moisture estimates, GEMS will generate production forecasts at a 1-kilometer spatial resolution, Henebry said.

Researchers decided on this resolution based on the quality and scope of historical and contemporary data and due to privacy concerns, he said. Just as the USDA Census of Agriculture withholds publishing county level data when there too few producers, too fine a spatial resolution could be interpreted as invasive, he said.

An early version of GEMS was proposed in 1998, Henebry said.

"Since then, there has been a ripening of ideas and an opening of data sources," he said. Satellite observations have improved and the Internet has amplified researchers' ability to dispense information quickly, he said.

In addition, Schacht said, grasslands have gained in economic value over the last decade as crop prices have fallen, while commodity prices such as beef have risen.

This economic development has encouraged an in-depth review of ways to insure the increasingly valuable grasslands and has emphasized the need for producers to manage their lands as effectively as possible, Schacht said.

GEMS should help producers and insurers meet these new goals, Henebry said, by providing them with a better sense of how current growing season weather and perceived forage conditions compare to past seasons and historical trends.

2004 Nebraska Grazing Conference to be Aug. 10-11



Kearney will again be the site of the annual Nebraska Grazing Conference, to be held August 10-11, 2004. The conference began in 2001, and has consistently drawn 200+ participants from several states. The program is in the planning stages. Past participants will receive a brochure in the mail. Watch for details in the Spring 2004 issue of this newsletter and in other media outlets.

Matching Beef Cattle Genetics to Feed Resources (continued from page 1)

summer range and low rainfall. In the LARRL environment the smallest biological type cow (Red Poll x Hereford) was the most productive.

Matching Biological Type to Feed Resources

Larger or smaller body size of animal could have very important biological advantages for adaptation to climate, feed resources, marketing specifications and maternal/paternal use in crossbreeding programs. Larger body size may have advantages in tolerance of cold stress and in more efficient use of abundant feed supplies, whereas smaller size may be an advantage in hotter, drier climates with sparse seasonal grazing.

Potential milk level would be optimum when adequate for calf survival and early growth but low enough to permit acceptable breeding condition during lactation. Thus, the optimum range of milk production is much wider in good feed environments than in limited feed environments

Jenkins and Ferrell also evaluated nine breeds of cattle (Figure 1) differing in biological type for life cycle production efficiency. Breeds in the study were Angus, Braunvieh, Charolais, Gelbvieh, Hereford, Limousin, Pinzgauer, Red Poll and Simmental. Mature cows within each breed were fed dry matter intakes ranging from 6,600 to 15,400 lb per year.

At lower levels of feed intake, breeds moderate in mature size, growth rate and lactation potential were more efficient. As the feed level increased, the breeds became more similar in production efficiency. At the highest level of feed availability, breeds with the greatest potential for mature size, growth rate and milk production were more efficient.

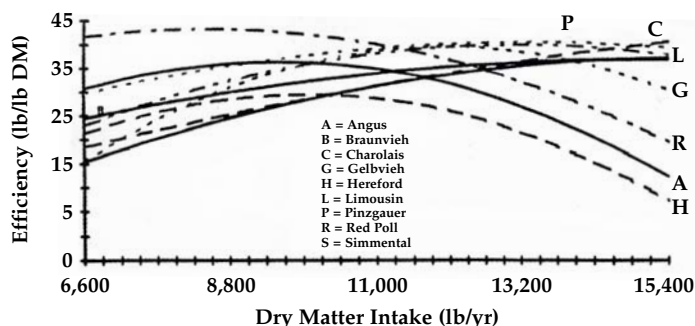


Figure 1. Predicted biological efficiency (pounds of calf weaned-pounds DMI⁻¹-cow exposed⁻¹) at varying DMI for nine breeds of cattle. (Jenkins and Ferrell, 1994)

Breeds with greater potential for growth and lactation are challenged more in a restrictive feed environment, resulting in lower reproductive rate. With fewer calves weaned, the feed consumption of the cow herd is spread across fewer pounds of calf weaned. The increased potential for growth in the calves that are weaned does not offset the lower calving rate. Those breeds with greater potential for growth rate and milk production respond to increased feed availability more than less productive breeds.

Market Endpoint Impacts Measures of Efficiency

Market endpoint has substantial impact on efficiency, according to MARC researcher Keith Gregory as reported in

Table 1. Significant changes in rank of various breeds were found for gain per unit of feed intake when slaughtered based on either time (207 days on feed), weight (734 lb. carcass wt.), or a composition constant (low choice marbling) endpoint. Gain efficiencies are expressed as liveweight gain (in grams) per megacalorie of metabolizable energy.

Lean growth breeds such as Limousin, Charolais and Gelbvieh were more efficient to a time or weight constant endpoint. However, given a marbling constant endpoint, a reversal of breed rankings occurs because of the greater marbling potential of the British breeds. The greater weight to which the lean growth breeds must be fed to achieve a small degree of marbling (minimum for the choice grade) increases the amount of feed required for maintenance, resulting in poorer efficiency.

Table 1. Breed Group Means of Gain Efficiency to Various Endpoints.

Breed group	Live-weight gain (grams) per Mcal of ME		
	Time (207 days on feed)	Weight (734 lb. carcass)	Composition Constant (low ch. marbling)
Red Poll	49	48	51
Hereford	54	51	57
Angus	50	49	54
Limousin	54	54	47
Braunvieh	50	51	49
Pinzgauer	50	50	51
Gelbvieh	48	49	45
Simmental	51	52	49
Charolais	52	53	49
Average	51	51	50

Gregory, et al., 1999

Matching Biological Type to Marketing Plans

The market target for calves does impact the choice of biological type of cow for a particular operation. Consideration of market targeting and biological cow type reveals two main points: 1) higher levels of milk production by cows are more conducive to immediately selling weaned calves, while calves from lower milking cows could be backgrounded or run on grass as yearlings to take advantage of compensatory gains; and 2) calves from higher growth/mature size types should be fed as calves, as they might produce carcasses too heavy if backgrounded and fed as yearlings.

Summary

Data indicate that:

- 1) Intermediate types of crossbred cows are usually most efficient under range conditions.
- 2) Rankings for the most efficient biological type of cow will change as the available feed resource changes.
- 3) Mature size, by itself, has limited impact on economic efficiency, but can have major impact on adaptability, reproduction and fitness to market specifications.
- 4) The range of optimum milk production level is much wider in an abundant feed resource than in a sparse feed resource.
- 5) Matching biological type of cow to feed resources will allow flexibility in marketing options for calves.
- 6) Crossbred cows are an important tool in matching genetics to feed resources.

Nebraska Ranch Practicum Enters Sixth Year

by Jerry Volesky, Don Adams, Richard Clark, Dillon Feuz, Patrick Reece, Brent Plugge, Bud Stolzenburg and Troy Walz, UNL

Applications are currently being accepted for the 2004 session of the Nebraska Ranch Practicum. Meeting dates will be June 16 and 17, July 20, September 8 and 9, November 9, 2004 and January 5 and 6, 2005.

The Nebraska Ranch Practicum is a comprehensive educational program initiated in 1999 to integrate information into a framework for decision-making in ranch management based on an understanding of seasonal patterns in markets, livestock nutrient requirements, and quantity and quality of forage resources. Specific objectives of the program are to: 1) improve decision-making skills needed to manage ranch operations more efficiently; 2) enhance stewardship of natural resources; 3) improve skills in critical evaluation of alternative production enterprises; and 4) enhance ranch sustainability. Cow-calf producers, veterinarians, extension educators, natural resource agency personnel, and other advisors to the industry can benefit from this program. It is taught by an interdisciplinary team of UNL professors: Patrick Reece and Jerry Volesky (Agronomy and Horticulture), Don Adams (Animal Science), Richard Clark and Dillon Feuz (Ag Economics). Extension educators Brent Plugge, Bud Stolzenburg, and Troy Walz also assist with instruction and serve as facilitators. The Ranch Practicum team was recognized for its efforts in 2002 when it received the University of Nebraska Cooperative Extension "Excellence in Team Programming" award.

The Gudmundsen Sandhills Laboratory (GSL) near Whitman, Nebraska is the primary site for the sessions. The laboratory is a 12,800-acre working ranch with research and education facilities. Andy Applegarth, GSL Manager, coordinates livestock and field demonstrations associated with the program.

The Practicum has eight full-day sessions over an eight-month period beginning in June of one year and ending in January of the succeeding year. Attendance at all sessions is important because of the sequential nature of the curriculum. The time frame provides a unique educational experience covering a production cycle of the cow and the forage resources. In addition, the Practicum combines classroom and "hands-on" learning experiences that emphasize an integrated systems approach to livestock and natural resources management. Animal, forage, and economic interactions and considerations are taught with the objective of improving the ability of participants to make management decisions and monitor progress toward their goals (Fig. 1).

To better understand seasonal interactions of plant and animal growth, participants monitor body condition score, milk production, and cow and calf weights through a production cycle. Discussion of the effect of calving season and weaning date on seasonal cow nutrient requirements is incorporated. Upland range and meadow forage quality is assessed with diet collections from esophageally-fistulated cattle and laboratory analysis. Participants are taught how to use the latest National Research Council's

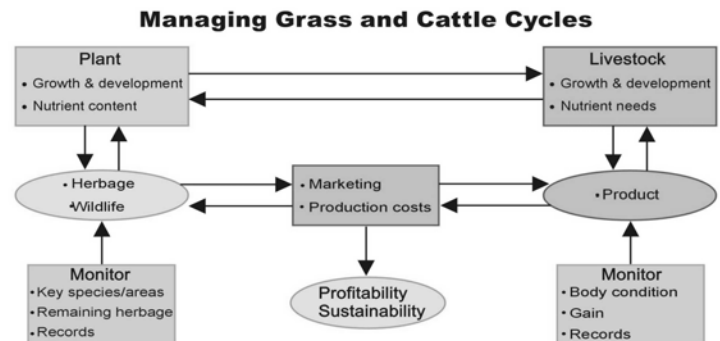


Figure 1. Interactions among livestock, plants and economics that are taught and demonstrated in the Ranch Practicum.

computer software on beef cattle nutritional requirements. The program evaluates nutritional characteristics and animal response to various grazing situations and/or supplemental feeds. The rations are also subjected to economic costs in the form of least-cost rations, demonstrating the link between economics and animal production.

Participants are taught plant identification and the principles of plant physiology and growth as well as methods for determining rangeland condition, amounts of available forage, and utilization. Instruction takes place in the classroom and on demonstration pasture sites. There are considerable discussions and observations of different grazing strategies and use of the Sandhills Defoliation Response Index System (SanDRIS), a decision-support tool for rangeland. The effects of drought on rangeland and management strategies for recovery after drought have been topics of recent interest. A demonstration site is used to show effects of grazing and fertilization on wet meadows and the effect of date of harvest on yield and quality of hay.

Economics are discussed in terms of financial and production records. Additionally, participants are provided decision-support tools for economic analysis of production systems or various management practices. Livestock marketing options are also discussed.

Participants from the first three years estimated a total savings of about \$27/cow from knowledge gained in the program.

The current Ranch Practicum enrollment fee of \$600 covers meals, instructional materials, and marketing. The Practicum may be taken for college credit (undergraduate or graduate) through UNL. Enrollment is limited to 30 participants.

Additional information and a printable application form are available at www.panhandle.unl.edu/ranchpracticum, or contact Brent Plugge, 1-800-657-2113, bplugge1@unl.edu.

Bull Riders for Biodiversity? — And Other Heresies for the Northern Great Plains

by Tyler Sutton, for The Conservation Alliance of the Great Plains

The title of this talk grew out of a conversation I had a few weeks ago with Jim Stubbendieck, rangeland ecologist and Director of the UNL Center for Great Plains Studies. I was at the Center to participate in a panel discussion about the New Homestead Act, proposed federal legislation sponsored by Senator Chuck Hagel and Congressman Tom Osborne, among others. The Act is intended to stabilize rural population loss and economic decline by providing certain tax and small business benefits to people in high out-migration counties -- primarily on the Great Plains.

At the panel discussion, I said the legislation was a step in the right direction for federal policy because it sought to diversify the region's economy, which at the moment rests largely on agriculture. I suggested, however, the Act could be improved by providing incentives to change the way some land in the region is used.

I have titled my remarks "Bull Riders for Biodiversity" to metaphorically and respectfully suggest that people in the region need to reexamine their attitudes and beliefs about land use and stewardship if we are to solve the region's ecological and economic problems, because economically, agriculture alone is unable to sustain the Northern Great Plains (northwestern Nebraska, western North and South Dakotas, and eastern Montana and Wyoming).

Modern agriculture in this region is heavily subsidized, yet the Northern Great Plains is one of the poorest regions in the country. In 2001 seven of the twelve poorest counties in the nation were in Nebraska, and all of them rely heavily on the livestock economy. In the recent past, the federal policy response to the region's economic woes was to provide more agricultural subsidies in one form or another, whether commodity payments, drought relief, or irrigation projects. These subsidies have not stemmed the exodus of people from rural areas -- just fueled farm and ranch expansion, thereby accelerating rural community decline. As agricultural units got bigger, people left agriculture, and the economic base of small towns deteriorated further, which led to greater out-migration.

I am not suggesting, nor do most rural advocates suggest, we simply eliminate agricultural subsidies to help rural communities. What I am saying is that many people have begun to question the importance of these subsidies to federal rural policy as well as the importance of the agricultural economy to the region's future.

At the same time that people are leaving and the economy is in a tailspin, ecologically, the Northern Great Plains is also in real trouble. Perhaps 40% of its grasslands has been converted to crop production. Native prairie continues to be converted to crops, mainly because of Farm Bill subsidies.

The majority of plant and animal species that are endemic, and thus dependent on the region, is in trouble. Grassland birds have shown steeper, more consistent, and more geographically widespread declines than any other

behavioral grouping of North American species, according to a report by The Nature Conservancy. Thirty-four species of flora and fauna are considered globally imperiled, and of these, ten are listed as threatened or endangered, and four are proposed for listing.

Of course, the landscape today is just a shadow of what it once was when Lewis and Clark made their way up the Missouri River. Even 150 years ago, the abundance of wildlife and prairie grasslands in the Northern Great Plains rivaled Africa's Serengeti. But since then, millions of buffalo were senselessly slaughtered. Wild buffalo and all the large predators that once depended on them were extirpated from the region, as were the elk and Big Horn Sheep, though recently some of these species have made a comeback in places. Today prairie dog numbers have been radically reduced and many species associated with the prairie dog ecosystem are in trouble.

In short, the "cattle culture" that evolved with the transformation of the plains has not been kind to the living creatures that it perceived as competing with it. By "cattle culture" I mean a set of shared attitudes and beliefs that are common in the region among people on the land, though they certainly are not found only among people engaged in agriculture. But these attitudes and beliefs are part of the mythology of ranching; they continue to grip the region's politics, and in my view, limit the region's economic development as well as conservation options.

I mean no disrespect here. The ranchers' historic struggle with the forces of nature is to be admired in many respects, as is their reluctance to plow the region's grasslands. There are, however, aspects of the cattle culture that are very troublesome as we contemplate the future of the plains, particularly the future of the region's biodiversity and small communities.

The cattle culture's definition of stewardship is obviously very narrow. It includes caring for and protecting only those parts of the prairie grassland ecosystem that it perceives as not competing for grass or interfering with the production of cattle. It also is hostile to the idea of public access to land and is contemptuous of government involvement in land ownership or management.

To be fair, ranchers struggle to exist within a corporate enterprise system that places severe limitations on how they can operate. Ranchers do not get paid to manage wildlife and biodiversity; they get paid what packer-dominated markets yield. Further, the cattle culture is not alone in its war on nature. However, it has had a significant role in fundamentally altering the region's grassland ecosystems, and I believe it must come to terms with that role for the region to recover from our collective mistakes.

In my panel presentation, I argued the New Homestead Act should be improved by providing incentives to change the way a portion of land in the region is owned and used. I believe it will lead to a more diverse rural economy, as well as a more diverse and sustainable prairie

landscape. This is not a radical idea. Rather, the idea of merging the protection of biodiversity with economic development that benefits local communities is basic to applied conservation as we enter the 21st Century.

Rural development advocates are supportive of exploring how community-based conservation projects can benefit the region's small towns. On balance though, rural development proposals involving land ownership and use change have been slow to develop and unimaginative because most people do not believe such alternatives are politically feasible given the cattle culture's current attitudes.

Notwithstanding this conventional wisdom, at the panel discussion I suggested that people in the Northern Great Plains should actively support the idea of making it a public policy goal to put 10-15% of the eco-region into permanent grassland conservation areas. These areas would be managed primarily for wildlife. Presently, about 1% of the region is in such a status (conservation area, park, or refuge) and globally, temperate grasslands are the terrestrial habitat least protected from human exploitation. Other areas of the country may have mountains or oceans, but this region has miles and miles of open space still covered in many areas with spectacular prairie grasses, an essential building block for restoring the ecological health of the region.

These areas would not be traditional parks, nor would they encourage the type of tourism associated with parks, which often is high volume and can lead to low wages and high infrastructure costs. These newly created areas would be open to hunting, fishing, hiking, horseback riding, wildlife viewing, and tribal cultural practices, but even high quality tourism would be a secondary motivation for communities to create these areas. The areas would be community assets first, much like urban parks and open space are for cities that want to attract highly skilled people. Only secondarily would these areas be for tourism.

In the panel discussion I suggested that the initial focus of such a strategy should logically be the National Grasslands because they are already publicly owned. There are nearly three million acres of National Grasslands in the states of Nebraska, the Dakotas and Wyoming. Nearby communities should work to create special management areas for the National Grasslands using community-based land trusts and innovative public-private partnerships to own land, acquire conservation easements and set wildlife management objectives. If local projects were part of a region-wide effort to protect 10-15% of the eco-region, the effort would be nationally and globally significant.

The creation of these areas would have direct economic benefits. The land trusts would attract private conservation capital to purchase land from willing sellers, thereby providing a buyer to landowners who wished to sell land to a conservation purchaser.

Local people would benefit from jobs created to manage the lands on a day-to-day basis. Other business opportunities would be associated with the change in land use, from prairie restoration contractors to nature-based tours, guiding and outfitting, horseback riding, lodges and similar businesses.

These areas would also potentially benefit from a shift in future spending under the Farm Bill, as world trade pressures lead to reductions in agricultural subsidies. Conservation spending may be the only way to avoid a

catastrophic collapse in federal payments to the region. In fact, this may be the most compelling reason to begin thinking seriously about this strategy.

Research dollars from universities, non-governmental organizations and other institutions that want to study the restorative effort would also undoubtedly flow to the local economy. And, yes, the areas would be targets for state and federal spending relating to species of concern and to develop outdoor recreation opportunities. But beyond the direct economic benefits, these areas would be a reason for people to stay in the region's small communities and for people to move there to retire or start entrepreneurial businesses. Research has shown that communities in sparsely populated areas that have access to natural amenities, which these areas would be, do better economically and demographically than areas without such access.

The region has some impressive national conservation partners such as the World Wildlife Fund and The Nature Conservancy that are willing to work with communities if such a public policy goal were established and communities started working locally for such an initiative.

From a conservation perspective, setting aside 10-15% of the region is no substitute for good private land conservation. But shifting the management objective on 10-15% of the land from cattle to biodiversity has the potential to capture the nation's imagination and turn its attention to the possibility the region has for large-scale wildlife conservation; private land conservation simply does not.

Ranchers need not fear their way of life will disappear; the vast majority of the region's grasslands will still be used for cattle production for generations to come.

Professor Stubbendieck shares my interests in protecting and restoring biodiversity on the plains, the future of rural areas and, as I discovered, rodeo. So I jested he should form a group called Bull Riders for Biodiversity to start a dialogue with urban dwellers on ways to solve the region's economic and ecological problems. I was thinking of Bull Riders for Biodiversity as a metaphor for new, more enlightened (at least from a biodiversity perspective) ranching leadership that would build bridges to urban conservationists so the two groups could develop a common agenda. He said it might be a good idea but it would be a very small group right now. This is unfortunate because in my opinion, stabilizing small towns while protecting the region's biodiversity will take inordinately longer and be much more difficult unless agricultural interests, mainly ranchers, come to realize they must become leaders in the effort to preserve the region's biodiversity. At the same time, over the long term, I believe the economic survival of ranching itself is tied to changing the way ranchers manage their land and get paid for it.

The New Homestead Act should become part of a broader conservation agenda of national and global significance. While support for agricultural subsidies may be waning, support for conservation spending remains high and will probably grow. We need to think bigger than just the New Homestead Act. We need to think in terms of a Northern Great Plains Restoration Act, a comprehensive land restoration and community revitalization policy tailored to the unique needs of the region.

But who is going to provide the leadership? Unless rural people in the region themselves are willing to take on

these issues, who in the nation is going to care what happens on the Northern Great Plains? Are people in small towns going to speak out about land use change or stewardship issues? For most small town residents, it is not in their short-term economic interest to risk offending their agricultural constituents. The inescapable conclusion is that unless new leadership develops soon in the ranching community, the most likely scenario on the Northern Great Plains is that the region will continue to die a slow and painful economic and ecological death.

When all is said and done, the fact is ranchers hold the key to the future on the Northern Great Plains. They will not dictate the outcome, so much as the timetable. But their leadership is critical to getting on with the job of restoring the region ecologically and economically.

Editor's Notes: This article is a condensed version of what Sutton presented at the Center for Grassland Studies Fall Seminar Series, November 17, 2003. For a copy of the complete article with references, contact the CGS office.

Nebraska Turfgrass Conference: 42 Years of Educating Nebraska Turfgrass Managers

by Roch Gaussoin, Department of Agronomy and
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The 42nd Annual Turfgrass Conference and Trade Show was recently held in Omaha. From modest beginnings on campus more than four decades ago, this collaborative effort between the university and the turfgrass industry conference has become one of the major turfgrass education events in the region. The goals of the conference include the promotion of integrated pest management practices, turfgrass sustainability, safe and effective use of pesticides and business profitability. This year more than 700 people enjoyed hearing UNL faculty and invited speakers from across the nation. In addition to educational sessions, an exhibit area allows participants to "kick the tires" on new equipment and get the latest information from industry.

The conference also generates significant income to support the UNL Turfgrass Science Team in its research, teaching and extension missions. Nearly \$500,000 has been given to UNL in the last ten years to support operations at the John Seaton Anderson Turfgrass Research Facility near Mead. Students have received more than \$10,000 in scholarships in the same time frame.

On recent surveys, participants who have attended the conference for several years were asked about changes in their operations. They reported the following benefits:

- 32% decrease in pesticide use; no participant reported an increase.
- 61% more efficient/safer use of pesticides.
- 48% greater use of cultural control of turf pests.
- 58% more efficient use of fertilizers. 40% more efficient use of water.
- 55% greater understanding of the environmental benefits of turfgrass.
- 76% becoming more efficient in managing time and resources.

In addition, 53% of those in a profit venture reported increasing their profitability; increases in profitability were reported to be up to 20% per year; no participant reported a decrease in profitability.

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Calendar

Contact CGS for more information on these upcoming events:

2004

- Mar. 27:** Beginning Farmer and Rancher Conference, Kearney, NE
- July 24-28:** Soil and Water Conservation Society annual meeting, St. Paul, MN
- Oct. 7-8:** Nebraska Section, Society for Range Management (theme is prescribed burning), Ainsworth, NE

2005

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

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