Center for Grassland Studies

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# Learning the Latest at UNL Turf Field Day

by Zac Reicher, Department of Agronomy and Horticulture, UNL

In spite of the heat, the UNL Turf Field Day held on August 11, 2010 drew almost 200 people who came to view the latest in turfgrass research, visit with UNL specialists, and attend an afternoon presentation on distribution of rotary spreaders. Research topics included herbicide and white grub updates, strategies for spring seeding, fertilization, and water management as well as alternative uses for grasses including biofuels and turfgrass-based antioxidants as potential cancer fighters.

On behalf of the UNL Turf Program, we really appreciate all of the turf professionals who participated in spite of the difficult growing conditions that we faced this past summer. The success of this event is due to extremely generous help from many UNL faculty and staff, and in particular, to the top-notch staff managing the John Seaton Anderson Turf and Ornamental Research Facility at the Agricultural Research and Development Center near Mead.

Next year's field day has been tentatively set for Wednesday, August 10, 2011.

**Master's student Alex Kohel (left) updated the crowd on his investigations into products that could dramatically quicken seed germination, and Dr. Roch Gaussoin discussed the latest in biofertilizers for the turf industry.**

**Seeding turfgrass in the spring or summer is usually hampered by weed competition and other issues. Matt Sousek is a technologist in the Turf Program and spoke about herbicide application strategies to control weeds in spring and summer seedings while still ensuring safety to the desired turf.**

**Dr. Fred Baxendale discussed white grub issues in Nebraska and the spread of the Japanese Beetle into the state.**

**Casey Wegner, a master's student in the UNL Turf Program, explained his work on isolating antioxidants from turfgrasses to use for pharmaceuticals to help fight cancer and other ailments.**

IANR

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 Citizens Advisory Council.

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..... Newsletter Editor
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# From the Director

It is nice to be back in the newly remodeled Keim Hall! For two years all former occupants of Keim Hall were relocated while the building was being internally restructured and modernized. In July we returned to the same basic area of the building (southwest corner of second floor), but what a difference! The outer shell of Keim, which was built in the 1940s, remained intact, but the interior area was completely "gutted" and reconfigured. Areas currently used by Center faculty, staff and students include: offices and conference room; reference center; classrooms; student testing center; student study/resource room; and a state-of-the-art teaching lab containing high-speed cameras, launch monitor and a putting fitting system for our PGA Golf Management students to use for improving their own swing as well as learning how to use the equipment for giving golf lessons.

Keim Hall is connected to Plant Sciences Hall, making for an open-square complex that surrounds a courtyard. Professor Kim Todd, Extension Horticulture Specialist and licensed landscape architect, along with her students in the landscape management program, designed and developed a beautiful and aesthetically pleasing courtyard for all building occupants, students and visitors to enjoy. As with other areas of campus, the courtyard also serves as an outdoor teaching lab.

The remodeled Keim is LEED certified. LEED – Leadership in Energy and Environmental Design – was developed by the U.S. Green Building Council to provide a framework for identifying and implementing practical, measurable "green buildings." According to Barry Shull, IANR facilities director, the LEED designation means the building is designed and built to improve energy savings, water efficiency, sustainability, improved indoor environmental quality, and stewardship of resources. It is interesting to see how previous Keim Hall materials were incorporated into the remodeled building. These much improved facilities should make our work more efficient and productive – and attractive to prospective students.

With the beginning of the academic year, students returning to campus, a crispness in the air and new facilities, there is a refreshing burst of energy occurring here. Student numbers continue to increase at the University of Nebraska-Lincoln, and incoming freshman are continuing to score higher on their academic tests.

We have approximately 165 students enrolled in the PGA Golf Management major, and with the new facilities, I believe we can grow that program to near 200 students in the next few years. There are about 20 students in the Grazing Livestock Systems major, which has stabilized in that range. We believe the GLS major is especially well suited to many of our students from rural Nebraska who may want to return to the farm or ranch, work for a state or federal agency relating to agricultural programs and/or land management, be employed in a farm/ranch management or related position with industry, serve as a private consultant or even pursue a graduate degree. Both of these majors are relatively new and are not as widely known as many of our long-standing majors.

Our students are obtaining satisfying and productive positions after graduation. It is most rewarding to us as faculty and staff to follow the development of their careers and watch them become successful individuals. They are our future, and it is important that we do the very best job we can in preparing them for that future.

M. A. Massengale

# Nothing Is Constant but Change Itself

Change seems to be the "constant" these days, and the Center for Grassland Studies has seen its share during the last two years. In the summer of 2008, we moved to temporary quarters while Keim Hall was completely renovated. In July of this year we happily moved back into what looked and felt like a brand new building with enhanced teaching and work facilities. Based on the reactions of prospective students when they make a campus visit, we think the new space enhances our recruitment efforts for the Grazing Livestock Systems (GRLS) and PGA Golf Management (PGAM) majors. The specially equipped spaces for PGAM students contribute to our having one of the premiere PGA Golf Management programs in the country (there are 20 such programs accredited by the PGA).

In the summer of 2009, we had a transition from Dr. Terry Riordan, who retired, to Dr. Alan Baquet as the Director of the PGA Golf Management program. This summer we had another retirement. Since the Center for Grassland Studies was formed in 1994, Jan Shamburg provided secretarial support for the CGS Director and other personnel in the Center. With mixed emotions, we bade Jan a fond farewell in late August. We are happy that she now has time to travel and do things she could not do while working full time, but we miss seeing her smiling face as we come in each morning. We are fortunate, however, to be greeted daily by another smiling face – that of Pamela Wealand. (Yes, out of three females in our small unit, two have the name of Pam, but since Pam Murray has seniority – 35 years at UNL – our new hire agreed to be called Pamela!) Pamela, who has lived in Lincoln previously, moved back here with her family in August from St. Louis. If you call our office, please welcome Pamela back to Nebraska!

**Jan Shamburg**

**Pamela Wealand**

# Dave Stock Receives Master Conservationist Award

A big congratulations goes out to Center for Grassland Studies Citizens Advisory Council member Dave Stock for receiving one of the seven 2010 Omaha World Herald's Master Conservationist awards. Stock Seed Farms is a producer and worldwide distributor of prairie grass and wildflower seed. Dave is the president of the seed company and owner-operator of the farm. The company is committed to conservation and sustainable methods of production. Dave received his degree in the UNL College of Agricultural Sciences and Natural Resources, and believes in giving back and educating others. The farm often serves as a training site for agricultural groups, and it sets aside space each year for University of Nebraska research. Dave serves on various committees such as our advisory council. He also hosted one of our Center tours and gave a presentation in our Center's Fall Seminar Series. Even the company's annual color catalog and web site have an educational component. Thanks, Dave, for being such a great example of a caring, sharing conservationist!

**Dave Stock (right) inspects grasses during a Center for Grassland Studies Citizens Advisory Council tour in 2009.**

# A Decade of Nebraska Grazing Conferences

About 240 people, including a record 22 exhibitors, participated in the Nebraska Grazing Conference held August 10-11, 2010 in Kearney. What did conference goers think of this event, which celebrated its 10th anniversary this year? Here is a sampling of comments from the evaluation forms.

"Tuesday was the best program day I have been to at the Grazing Conference. I especially liked the information on how families have transitioned their farms to the next generation."

"Generational transitioning session was excellent – nice balance and very thought provoking."

"The conference was very good, it had me glued to my seat, never bored."

"Excellent variety once again, a little of everything for everyone; excellent topics and speakers."

"[Neil Dennis was] an interesting and very entertaining speaker who provided very simple & down-to-earth management practices that everyone should understand."

"Learned a lot of useful tips and skills I can apply at my operation."

"Found all [presentations] very intriguing and beneficial."

"Dennis Bauer's talk on minerals was an eye opener. Any speaker you can get to save the producer money is great!"

"My first conference; good fit to current trends."

"Another valuable conference! I look forward to it every year."

"Best year ever!"

Proceedings from the 2010 and previous conferences are still available for purchase; they contain the material submitted by most of the presenters prior to the conferences. The conference website (www.grassland.unl.edu/grazeconf.htm) contains the list of speakers and topics for each conference. To order proceedings, send a check payable to Nebraska Grazing Conference to the CGS office – note which year(s) you are ordering.

If you have not attended previous conferences but would like to be on the mailing list to receive notice of next year's conference, to be held in the same location on August 9-10, simply send your name and address to the CGS office. Details of the 2011 program will be posted on the conference website (a link from the CGS site) as they become available early next year.

The Nebraska Grazing Conference has several sponsors including this year's conference underwriters: Center for Grassland Studies, Nebraska Game and Parks Commission, and Nebraska Grazing Lands Coalition.

**Attendees of the concurrent session on generational transitioning heard from John McGlynn of Verdigre on the need and options for good financial plans, Sherry Vinton and daughter Jessica Taylor from the Whitman/Tryon area on what is involved in continuing the ranching tradition in the Sandhills, and Kristen and Todd Eggerling of Martell on how generations can work together to achieve conservation management goals.**

**Dr. Tom Noffsinger drew an inquisitive crowd as he prepared to give his evening workshop, with illustrative videos, on caregiver impact on cattle performance.**

**UNL range scientists Jerry Volesky (left) and Walter Schacht, answered questions on their presentation on grazing strategies for Sandhills uplands. Bill Vodehnal (right) with Nebraska Game and Parks Commission was the conference moderator that day.**

After setting the stage with brief historical background on grassland ecosystems of the Great Plains, Johathan Haufler with Ecosystem Management Research Institute in Montana discussed methods of restoring native grasslands, including grazing, fire, and seeding.

From his requisite barstool, Neil Dennis, owner of Sunnybrae Farms in Saskatchewan, talked about his experiences with building soil health using high stock density methods.

Productive and persistent forages for dryland acres was presented by Keith Harmoney from Kansas State University.

In addition to his morning presentation, Neil Dennis (still perched on his barstool) joined UNL Extension Educator Terry Gompert and Doug Peterson with the USDA/NRCS from Gallatin, MO to give the afternoon concurrent session on mob grazing.

Long-time UNL Extension Educator Dennis Bauer gave the audience tools, based on his and others' research, to help decide if custom mineral mixes are feasible for a grazing operation.

Heidi Hillhouse, ecologist and post-doctoral research associate at UNL, and Andy Bishop with the US Fish and Wildlife Service, helped the audience make connections between conservation and agricultural interests as they discussed the importance of grazing in Rainwater Basin wetlands.

Belgrade, Nebraska farmer Jim Knopik piqued the audience's interest as he described his and others' efforts to establish a mobile meat processing unit and develop avenues to direct-market grass-fed meat.

Tom Noffsinger shared his vast experience as a veterinarian working with grazing operations in the Benkelman area during his presentation on stockmanship concepts.

# Economic Analysis of Supplementing DDGS to Grazing Steers

By Andrea Watson, Terry Klopfenstein, Galen Erickson, Darrell Mark, and Walter Schacht[1]

Supplementing cattle with dry distiller's grains with solubles (DDGS) supplies the cattle with excess nitrogen (N) in their diet, which is excreted in the form of urea in the urine. This urea is quickly broken down in the soil and utilized by plants to increase production. Rotating the cattle between paddocks during the growing season will ensure a more even application of this excess N onto the pastures. Supplementing with DDGS also increases average daily gain (ADG) of the cattle while decreasing forage intakes. This study was designed to compare the effects of either supplementing cattle with DDGS or fertilizing pastures with N in the spring while also examining the economic implications of these treatments.

## Procedure

This study was conducted at the Agricultural Research and Development Center near Mead, NE on smooth bromegrass pastures. It spanned 5 years (2005-2009) and utilized 225 yearling steers averaging 716 lb at the beginning of the trial. Three grazing strategies were evaluated: 1) pastures fertilized in the spring with 80 lb/N acre and stocked at 4 animal unit months (AUM)/acre; 2) non-fertilized pastures with calves supplemented daily with DDGS at 0.6% of their body weight (BW) and stocked at 4 AUM/acre; 3) control pastures with no fertilizer applied or cattle supplementation and stocked at 2.8 AUM/acre. Pastures were divided equally into 6 paddocks that were rotationally grazed from late April through September each year. Each paddock was grazed 5 times per year with cattle being rotated after 4 days of grazing at the beginning of the growing season and after 6 days of grazing the remainder of the season. In 2009 total forage production was measured on all pastures to determine if there were differences after 5 years of these treatments being applied.

All prices were based on averages from 2005 to 2009 (Table 1). Initial steer cost was based on average Nebraska sale barn prices in April for 700-750 lb steers. Yardage was included at $0.10 per steer daily to account for labor in building and maintaining fences as well as daily checking of animals and watering. An $8.33/steer health and processing fee was charged over the grazing period. Death loss of 0.5% was charged, based on initial steer cost. Cash rent for pastures was based on $23.86/AUM, the Nebraska average pasture rent. Fertilizer price of $419.20/ton was based on urea prices in April compiled by the National Agricultural Statistics Service (USDA, 2010) plus a $4.00/ton application fee. Interest rates were obtained from the Federal Reserve Bank of Kansas City and averaged 7.6%. Simple interest was charged on initial steer cost and cash rent cost for one-half of the grazing period. DDGS prices in Nebraska from April through September were reported by USDA-AMS and averaged $116.80/ton on a 90% dry matter (DM) basis. A $24/ton delivery and handling fee was assessed. Prices for feeder calves in October at Nebraska sale barns were used to determine final live value on the steers. Because of the price slide associated with feeder cattle, different values were used for the unsupplemented steers compared to the supplemented steers because the supplemented steers gained more weight over the grazing season. Costs of gain (COG) over the grazing period were calculated by dividing total costs, minus initial steer cost

**Table 1. Economic evaluation of grazing management and supplementation strategies for steers grazing smooth bromegrass.**

| | CON | FERT | SUPP[1] | SEM | P-Value |
|---|---|---|---|---|---|
| Initial BW, lb | 718 | 716 | 713 | 12.78 | 0.96 |
| Ending BW, lb | 959[a] | 954[a] | 1046[b] | 15.4 | <0.01 |
| Head days | 868 | 912 | 898 | 19.24 | 0.26 |
| | | | | | |
| Initial Cost, $/head | 796.95 | 795.63 | 791.50 | 14.20 | 0.96 |
| DDGS, $/head | | | 59.14 | | |
| Fertilizer, $/head | | 35.48 | | | |
| Land Cash Rent, $/head | 105.71 | 69.65 | 70.78 | | |
| Yardage, $/head | 15.84 | 15.84 | 15.84 | | |
| Health and Processing, $/head | 8.33 | 8.33 | 8.33 | | |
| Death Loss, $/head | 3.98 | 3.98 | 3.96 | | |
| Interest, $/head | 23.16 | 22.23 | 22.14 | | |
| | | | | | |
| Total Cost, $/head | 953.97 | 951.14 | 971.69 | 14.63 | 0.56 |
| Total Revenue, $/head | 947.77[a] | 942.43[a] | 994.48[b] | 14.97 | 0.03 |
| | | | | | |
| Profit, $/head | -6.20[a] | -8.71[a] | 22.79[b] | 8.11 | 0.02 |
| COG, $/cwt gained | 56.48[a] | 56.86[a] | 47.93[b] | 0.02 | <0.01 |
| Breakeven, $/cwt ending weight | 99.46[a] | 99.72[a] | 92.89[b] | 0.01 | <0.01 |

[a,b] Means within a row with unlike superscripts differ (P < 0.05).

[1]Pastures were either non-fertilized (CON), fertilized with N at 80 lb/acre (FERT), or non-fertilized and steers were supplemented with 0.6% of BW of DDGS daily for the entire grazing period (SUPP).

**Table 2. Effects of varying N fertilizer and land prices on costs of gain for steers grazing fertilized smooth bromegrass in eastern Nebraska.**

| Fertilizer prices, $/lb N | Land prices, $/AUM | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 0.30 | 0.45 | 0.46 | 0.47 | 0.49 | 0.50 | 0.51 | 0.52 | 0.54 | 0.55 | 0.56 | 0.57 |
| 0.35 | 0.46 | 0.48 | 0.49 | 0.50 | 0.51 | 0.53 | 0.54 | 0.55 | 0.56 | 0.58 | 0.59 |
| 0.40 | 0.48 | 0.49 | 0.50 | 0.52 | 0.53 | 0.54 | 0.55 | 0.57 | 0.58 | 0.59 | 0.60 |
| 0.45 | 0.49 | 0.51 | 0.52 | 0.53 | 0.54 | 0.56 | 0.57 | 0.58 | 0.59 | 0.60 | 0.62 |
| 0.50 | 0.51 | 0.52 | 0.53 | 0.55 | 0.56 | 0.57 | 0.58 | 0.59 | 0.61 | 0.62 | 0.63 |
| 0.55 | 0.52 | 0.54 | 0.55 | 0.56 | 0.57 | 0.58 | 0.60 | 0.61 | 0.62 | 0.63 | 0.65 |
| 0.60 | 0.54 | 0.55 | 0.56 | 0.57 | 0.59 | 0.60 | 0.61 | 0.62 | 0.64 | 0.65 | 0.66 |
| 0.65 | 0.55 | 0.56 | 0.58 | 0.59 | 0.60 | 0.61 | 0.63 | 0.64 | 0.65 | 0.66 | 0.67 |
| 0.70 | 0.57 | 0.58 | 0.59 | 0.60 | 0.62 | 0.63 | 0.64 | 0.65 | 0.66 | 0.68 | 0.69 |
| 0.75 | 0.58 | 0.59 | 0.61 | 0.62 | 0.63 | 0.64 | 0.65 | 0.67 | 0.68 | 0.69 | 0.70 |
| 0.80 | 0.60 | 0.61 | 0.62 | 0.63 | 0.64 | 0.66 | 0.67 | 0.68 | 0.69 | 0.71 | 0.72 |
| 0.85 | 0.61 | 0.62 | 0.63 | 0.65 | 0.66 | 0.67 | 0.68 | 0.70 | 0.71 | 0.72 | 0.73 |
| 0.90 | 0.62 | 0.64 | 0.65 | 0.66 | 0.67 | 0.69 | 0.70 | 0.71 | 0.72 | 0.73 | 0.75 |

and interest, by the total weight gained by the animal during the grazing season. Breakeven prices were calculated by dividing total costs by the final shrunk BW of the animal at the end of the grazing season. Profitability was calculated as total live value of the animal in October minus total costs during the grazing season.

## Results

Steers that received DDGS supplement gained 0.59 lb/day more than cattle on unsupplemented treatments. This resulted in supplemented cattle weighing 90 lb more at the end of the grazing season. Total forage production measured in 2009 showed that pastures receiving 80 lb N/acre in the spring had the greatest forage production per acre overall, while control pastures had the least growth and pastures with supplemented cattle had intermediate forage production.

Initial cost of the steers averaged $794.69/head for all treatments. Distillers grains costs for the supplemented cattle equaled $59.14/head based on steers eating on average 5.3 lb/steer/day of DDGS. Fertilized pastures had an increased cost of $35.48/head for the application of 80 lbs N/acre in the spring.

Cash rent values for land differed by treatment because of the different stocking rates used. The control pastures were stocked at 3.39 AUM/acre on average over the entire 5 years. Multiplying this by the average Nebraska cash rent price of $23.86/AUM results in a price of $80.89/acre for all treatments. Multiplying this by the number of acres, then dividing by the number of head days, and then multiplying by the average number of grazing days gives the cost of land per steer for each treatment. Cash rent was $105.71/head for the control, $69.65/head for the fertilized pastures, and $70.78/head for the supplemented steers.

Revenue was equal to final BW of the steers multiplied by $98.81/cwt for the unsupplemented cattle and multiplied by $95.01/cwt for the heavier, supplemented cattle. Total revenue

*(continued on page 8)*

**Table 3. Effects of varying DDGS and land prices on costs of gain for steers supplemented with DDGS while grazing smooth bromegrass in eastern Nebraska.**

| DDGS prices, $/ton | Land prices, $/AUM | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 50 | 0.32 | 0.33 | 0.34 | 0.35 | 0.36 | 0.37 | 0.38 | 0.38 | 0.39 | 0.40 | 0.41 |
| 60 | 0.34 | 0.34 | 0.35 | 0.36 | 0.37 | 0.38 | 0.39 | 0.40 | 0.41 | 0.41 | 0.42 |
| 70 | 0.35 | 0.36 | 0.37 | 0.37 | 0.38 | 0.39 | 0.40 | 0.41 | 0.42 | 0.43 | 0.44 |
| 80 | 0.36 | 0.37 | 0.38 | 0.39 | 0.40 | 0.40 | 0.41 | 0.42 | 0.43 | 0.44 | 0.45 |
| 90 | 0.37 | 0.38 | 0.39 | 0.40 | 0.41 | 0.42 | 0.43 | 0.43 | 0.44 | 0.45 | 0.46 |
| 100 | 0.39 | 0.39 | 0.40 | 0.41 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 | 0.46 | 0.47 |
| 110 | 0.40 | 0.41 | 0.42 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 | 0.47 | 0.48 | 0.49 |
| 120 | 0.41 | 0.42 | 0.43 | 0.44 | 0.45 | 0.45 | 0.46 | 0.47 | 0.48 | 0.49 | 0.50 |
| 130 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 | 0.47 | 0.48 | 0.49 | 0.49 | 0.50 | 0.51 |
| 140 | 0.44 | 0.45 | 0.45 | 0.46 | 0.47 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.52 |
| 150 | 0.45 | 0.46 | 0.47 | 0.48 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.53 | 0.54 |
| 160 | 0.46 | 0.47 | 0.48 | 0.49 | 0.50 | 0.51 | 0.51 | 0.52 | 0.53 | 0.54 | 0.55 |
| 170 | 0.47 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.53 | 0.54 | 0.54 | 0.55 | 0.56 |
| 180 | 0.49 | 0.50 | 0.50 | 0.51 | 0.52 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 | 0.57 |
| 190 | 0.50 | 0.51 | 0.52 | 0.53 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 | 0.58 | 0.59 |
| 200 | 0.51 | 0.52 | 0.53 | 0.54 | 0.55 | 0.56 | 0.56 | 0.57 | 0.58 | 0.59 | 0.60 |

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## Economic Analysis of Supplementing DDGS to Grazing Steers *(continued from page 7)*

was greatest for supplemented steers. Profitability was greatest for supplemented steers at $22.79/head while both of the unsupplemented treatments lost money at -$8.71/head and -$6.20/head for the fertilized and control treatments, respectively. Cost of gain (COG) and breakeven prices were lowest for the supplemented steers.

As prices for land, N fertilizer, and DDGS fluctuate over time, profitability of these treatments will be impacted. In Tables 2 and 3 all input costs are held constant while land, N fertilizer, and DDGS prices vary, showing the resulting effect on COG. All prices above and to the left of the dividing line represent profitable COGs, assuming a constant cattle price. Prices below and to the right of the dividing line represent COGs where producers would lose money. For the fertilized treatment, in order to breakeven, producers need to keep COG at or below $0.53/lb (Table 2); for the supplemented treatment it is $0.54/lb (Table 3). As land prices increase, the incentive to use either N fertilizer or DDGS supplementation increases. The supplemented treatment is the most profitable with current N fertilizer prices above $300/ton for urea and DDGS prices around $100/ton. The supplemented treatment is also a sustainable system, with cattle having increased gains and pastures having increased growth compared to a control system.

[1]Andrea Watson (graduate student), Terry Klopfenstein and Galen Erickson, Department of Animal Science; Darrell Mark, Department of Agricultural Economics; Walter Schacht, Department of Agronomy and Horticulture, UNL.

## Reminder: Smithsonian Exhibit on Soil Open through December 26

As noted in the previous issue of this newsletter, the "Dig it! The Secrets of Soil" exhibit is now on display at the Durham Museum in Omaha through December 26, 2010. As the Durham Web site states: "This unique exhibit from the Smithsonian's National Museum of Natural History allows visitors to unearth the many ways we benefit from soils and how we affect their health and productivity." This is a special educational opportunity for the public, and especially teachers and students. Details at http://durhammuseum.org/experience/exhibits/temporary/exhibit-details.aspx?ID=185.