

**CLEAN WATER ACT SECTION 319
NONPOINT SOURCE CONTROL PROGRAM
FINAL REPORT
GRASSLANDS MANAGEMENT AND PLANNING PROJECT**

SPONSOR

SOUTH DAKOTA GRASSLANDS COALITION

PROJECT COORDINATOR

JUSTIN JESSOP

DECEMBER 2007

This project was conducted in cooperation with the State of South Dakota and the United States Environmental Protection Agency, Region VIII.

Grant # C9998185-01

Executive Summary

Project Title: Grasslands Management and Planning Project

Grant #: C9998185-01

Project Start Date: July 1, 2001

Project Completion Date: June 30, 2007

| | | |
|----------|---------------------------------|----------------|
| Funding: | Total Project Budget | \$1,762,487.00 |
| | Total EPA Grant | 500,000.00 |
| | Total Expenditures of EPA Funds | 500,000.00 |
| | Total Section 319 Match Accrued | 451,091.39 |
| | Total Expenditures | 951,091.39 |

The goal of the Grasslands Management and Planning project was:

Reduce sediment, nutrient and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition. By reaching the goal, water quality and wildlife habitat will be improved, biodiversity increased and grassland manager economic sustainability maximized.

The South Dakota Grassland Coalition sponsored the five-year project with partnership support from agricultural organizations, agencies, local government, and South Dakota State University. The objectives of this project segment were:

1. Plan (150,000 acres) and implement (300,000 acres) grassland management systems.
2. Complete an information and education program that includes on-ranch demonstrations, tours, workshops, web site, grazing schools, video, and news media events, (feature articles, TV)

Through the South Dakota Grazing Management & Planning Project (formerly the Management Intensive Grazing Systems (MiG) Project), initiated in July, 1999, grassland managers, grassland and livestock organizations, and local, state, and federal agencies worked together to design, implement, and monitor "management intensive" grazing systems. In addition, information learned from the on-ranch demonstrations and other producers was shared with other grassland managers, researchers, agency specialists, and the public.

Six systems totaling 7,681 acres were developed on managed grazing demonstration sites across the state. Monitoring and evaluation of these sites will be continued throughout the duration of the next project. A map showing the locations of these sites is available at:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

The Best Management Practices (BMPs) installed and the management practices employed at the demonstration sites showcase and evaluate different types of managed grazing systems. Information about the sites and the lessons learned is available by visiting:

<http://www.sdconservation.org/grassland/managing/gmd/index.html>

According to an evaluation conducted by South Dakota State University of two demonstration sites, “good grassland management stabilized forage production and thereby improved efficiency of the water cycle by reducing runoff.”

The challenge to the Project partnership was to "manage grasslands through methods that increase profits while producing the desired vegetation, clean water, and a healthy and more diverse wildlife population." Technical assistance was available through this project for ranchers interested in exploring ways to improve their operation.

When the project began, an estimated 83 percent of South Dakota's grasslands were rated in poor, fair, or good condition (ecological status) providing less than optimum environmental and economic benefits. The procedure to determine range condition changed during this project's term; however, the previous procedure can still be used to compare results achieved in the project. Since the project's inception during July 2001, 61 livestock producers who manage over 201,000 acres of grassland in South Dakota have received assistance for the development and implementation of managed grazing systems that range from 30 to over 31,500 acres in size. The producers improved the grass condition at least one condition level, primarily from fair to good.

Opportunities to learn about the project and the environmental and economic benefits of managed grazing were provided to over 2,000,000 individuals. The total includes estimated booth traffic at events (conferences, trade shows, etc.); attendance at field days, workshops, and meetings; circulation of periodicals and radio station market size.

Field days at the sites were held from 2001 through 2007 to transfer information to producers and resource managers about the benefits of BMPs and management practices used on the systems. Over 1,500 farmers, ranchers, and resource managers attended the tours and field days held during the project period 2001 – 2007

News releases about the project field days and tours were printed by approximately 20 different newspapers and three agricultural trade papers. The South Dakota Grasslands Coalition, in cooperation with its project partners, published 5,000 grazing guidebooks titled *Greener Pastures*. A five segment video program was produced and aired for television. The video provides the livestock industry and general public with information about managed grazing and how the practices protect the environment while improving producer profitability.

Four grazing schools provided producers and agency personnel hands-on learning experience developing grazing management systems. The two and one-half day schools encouraged producer interaction and mentoring. An estimated 85 to 90 percent of those attending implemented one or more aspects of what they learned through the grazing schools.

The USDA-Natural Resources Conservation Service recognized the project's accomplishments when they awarded the project sponsor, the South Dakota Grassland Coalition, the agency's 2007 Excellence in Conservation Award. Only one award is given each year. In 2007, the Coalition and project staff also received Environmental Achievement Awards from Region 8 of the US Environmental Protection Agency.

Using the activities developed, program efforts are expected to continue to bring grassland acres under active grazing management plans, resulting in improved range conditions that will lead to improved water quality across the state.

The project goal was attained.

ACKNOWLEDGEMENTS

The South Dakota Grassland Coalition would like to thank all those involved with this project. The efforts of all those involved from the following organizations are greatly appreciated and have been essential to the success of the project.

- Blair Brothers
- Scott Carlson
- Christiansen Land and Cattle Ltd.
- Jim & Carol Faulstich
- Karlen Ranch
- Tom Scott
- Mark Sip
- Dave Steffen
- American Creek Conservation District
- Brule-Buffalo Bootstraps Group
- Brule-Buffalo Conservation District
- Crow Creek Tribe
- Cooperative Extension Service
- Ducks Unlimited
- Kennebec Telephone, Inc.
- Lower James RC&D Council
- Pheasants Forever
- South Dakota Association of Conservation Districts
- South Dakota Cattlemen's Association
- South Dakota Conservation Commission
- South Dakota Department of Agriculture
- South Dakota Department of Environment & Natural Resources
- South Dakota Department of Game, Fish & Parks
- South Dakota Nature Conservancy
- South Dakota Ornithologist Society
- South Dakota Section of the Society for Range Management
- South Dakota State University
- South Dakota Stockgrowers Association
- USDA – Natural Resources Conservation Service
- USDA –Resource Conservation and Development Councils
- USDI - Fish and Wildlife Service
- US Environmental Protection Agency

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Introduction

The Grasslands Management and Planning Project was sponsored by the South Dakota Grasslands Coalition with support from agricultural organizations; local, state, and federal agencies; and the academic community.

The South Dakota Grasslands Coalition (SDGLC) is a non-profit organization of individuals, private organizations, and local, state and federal agencies that was formed to provide a unified voice for grassland management in South Dakota. The Coalition is part of the Grazing Lands Conservation Initiative (GLCI). The initiative is a nationwide effort by Natural Resources Conservation Service (NRCS) to provide technical assistance to private grazing land operators and increase the awareness of the importance of grazing land resources. For additional information about the Coalition visit:

<http://www.sdgrass.org/>

Grasslands are one of South Dakota's greatest natural resources. Grasslands are a community of plants and animals where grasses are the predominant vegetation. Grasslands in South Dakota receive between 10 and 30 inches of rain per year.

South Dakota is mostly mixed grass prairie and tall grass prairie. Deposits left behind by the glacier that created the Missouri River and high annual rainfall formed the basis for the tall-grass prairie. In 1997, there were 1,245,700 acres of tall-grass prairie left in SD. In central and western SD, poorer soils and less rainfall resulted in the development of mixed-grass prairie. In 1997, there were 20,630,700 acres of the mixed grass prairie remaining in SD (Source: National Resource Inventory, 1997). Since 1997, 1,725,720 acres of grassland were converted to other uses, predominantly cropland, due to higher commodity prices. (Source: Natural Resource Inventory, 2003)

Grasses and other plants found here are the base of a food chain that supports hundreds of species of wildlife as well as livestock. Grasses make their own food and energy. Grasslands are a renewable resource, when they are managed properly.

South Dakota's grasslands are used for many things, including watershed management, recreation, wildlife habitat, and hay production. The most common use is grazing by livestock. One third of the nation's private land, 642 million acres of grassland, is grazed by livestock. The remaining grasslands are owned by state or federal agencies, including National Grasslands, National Parks, and Wildlife Refuges.

High condition grasslands yield 25 percent of the precipitation received as runoff, (Welch et.al, 1991) versus 45 percent for low condition sites dominated by sod forming grasses and 75 percent for bare ground. Sediment peaks on high condition grasslands are 20 percent of those on low condition grasslands. Gullies, headcuts and stream bank erosion are more prominent on low condition grasslands. Rotationally grazed pastures contribute four times more nutrients to waterbodies than do continuously grazed pastures. Annual soil erosion ranges from 10 to 60 times higher for watersheds predominated with continuous cropping versus perennial grass watersheds (Krishna, et. al. 1988).

Therefore, by improving and maintaining range condition and promoting the use of rotational grazing, it is anticipated that this project will directly reduce sediment loading by 50 percent, nutrient loading by 25 percent, and fecal coliform bacteria loading by 25 percent from 300,000 acres of grasslands. Additional, similar reductions in water pollution will be accomplished through the information and education campaign which is a significant part of this project.

As project sponsor, SDGLC was responsible for both project administration and the attainment of project goals. Day-to-day administration, supervision of project employees, and financial management was accomplished through a cooperative management agreement with the South Dakota Association of Conservation Districts (SDACD). The project coordinator, who was responsible for project operations, received immediate administrative direction from SDACD. The coalition monitored the project progress and provided direction through interaction with the administrative subcontractor and staff during monthly directors' meetings.

The South Dakota Department of Agriculture (SDDA) provided financial assistance for the establishment and operation of six managed grazing demonstration sites. The funds were provided through a South Dakota Soil and Water Conservation Grant awarded to the American Creek Conservation District. SDDA also made available the services of a department range specialist to assist with the development of grazing systems.

Since the project's inception during July 2001, 61 livestock producers who manage over 201,000 acres of grassland in South Dakota have received assistance for the development and implementation of managed grazing systems that range from 30 to over 31,500 acres in size. An additional six systems were developed on managed grazing demonstration sites across the state. These sites, totaling 7,681 acres, exceed the acreage milestone for this activity and were completed ahead of schedule. Monitoring and evaluation of these sites will be continued throughout the duration of the next project. A map showing the locations of these sites is available at:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

The Best Management Practices (BMPs) installed and the management practices employed at the demonstration sites showcase and evaluate different types of managed grazing systems. Information about the sites and the lessons learned is available by visiting:

<http://www.sdconservation.org/grassland/managing/gmd/index.html>

Water quality, wildlife vegetation, and economic parameters were monitored at each of the six sites during the grazing season. Field days, media releases, and the project web site were used to transfer information gained to producers, researchers, grassland specialists, and the public.

More than 1,500 producers and resource managers attended field days held at the Daybreak Ranch, and Karlen, Sip, Scott, and Blair demonstration sites, and the annual coalition bus tour and other related tours.

Additional project information transfer activities completed during the project include:

- development and maintenance of a project website,
- presentations at workshops/conferences,
- exhibits/displays at livestock shows, conventions, and workshops,
- news releases distributed to local news outlets,
- articles in regional and national agricultural publications, and
- radio interviews aired on stations in South Dakota

The project goal was attained by meeting or exceeding workplan milestones. Using the activities developed, program efforts are expected to continue to bring grassland acres under active grazing management plans, resulting in improved range conditions that will lead to improved water quality across the state.

Project Goals, Objectives, and Activities

Project Goal

The project goal was:

“Reduce sediment, nutrient and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition.”

By reaching the goal, water quality and wildlife habitat will be improved, biodiversity increased and grassland manager economic sustainability maximized. The goal was met by increasing the capacity to provide grassland managers in South Dakota with technical assistance and implementation of an information transfer program. Activities completed to attain the goal are described in this section of the report.

Objectives, Tasks, and Products

Objective 1: Accelerate the planning, design, and implementation of grassland management systems with emphasis on rotational grazing systems that benefit riparian areas and adjacent uplands.

Task 1: Provide grassland management system planning, design, implementation, and monitoring technical assistance.

Milestone: Planned - 75 grazing management plans on 150,000 acres

Accomplished: 61 grazing management plans on 217,067 acres

The Project Coordinator and contract grassland resource management specialists identified interested producers and provided the technical assistance necessary to plan and implement managed grazing systems.

Information about procedures for requesting assistance from the project and evaluating and prioritizing applications received was available from project personnel, local conservation districts and watershed offices or by visiting:

<http://www.sdconservation.org/grassland/managing/started.html>

Assistance to producers was scheduled using a priority ranking system developed by the project advisory workgroup and personnel.

To aid planning and monitoring activities, producers who received assistance were provided with a copy of *Grassland Plants of South Dakota and the Northern Great Plains*. The book was produced with support from the South Dakota Department of Environment and Natural Resource's 1998 319 NPS Information and Education Grant from EPA (C9998185-98) and the 319 NPS Grant to SDACD through DENR for the Bootstraps Inventory and Coordination Grant (C9990185-97). In addition, producers were provided with a grazing stick. A grazing stick is a specially designed yardstick. Printed on the sides of the stick are formulas, tips and guidelines to

help manage a ranch or pastures. Funds to purchase 4,000 grazing sticks (Figure 1.) were provided by the United States Fish and Wildlife Service-South Dakota Partners for Fish and Wildlife program and this project.



Figure 1. Grassland managers use grazing sticks to monitor grass growth.

Initially, applications for assistance and the implementation of management systems were less than anticipated. However, a drought, from 2002 through 2006, lead to an increase in applications and implementation. The activity moved the project ahead of schedule as producers learned that planned grazing provided a tool for surviving drought.

U.S. Drought Monitor



- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional

Drought Impact Types:
 A = Agriculture
 W = Water (Hydrological)
 F = Fire danger (Wildfires)
 — Delineates dominant impacts
 (No type = All 3 impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>

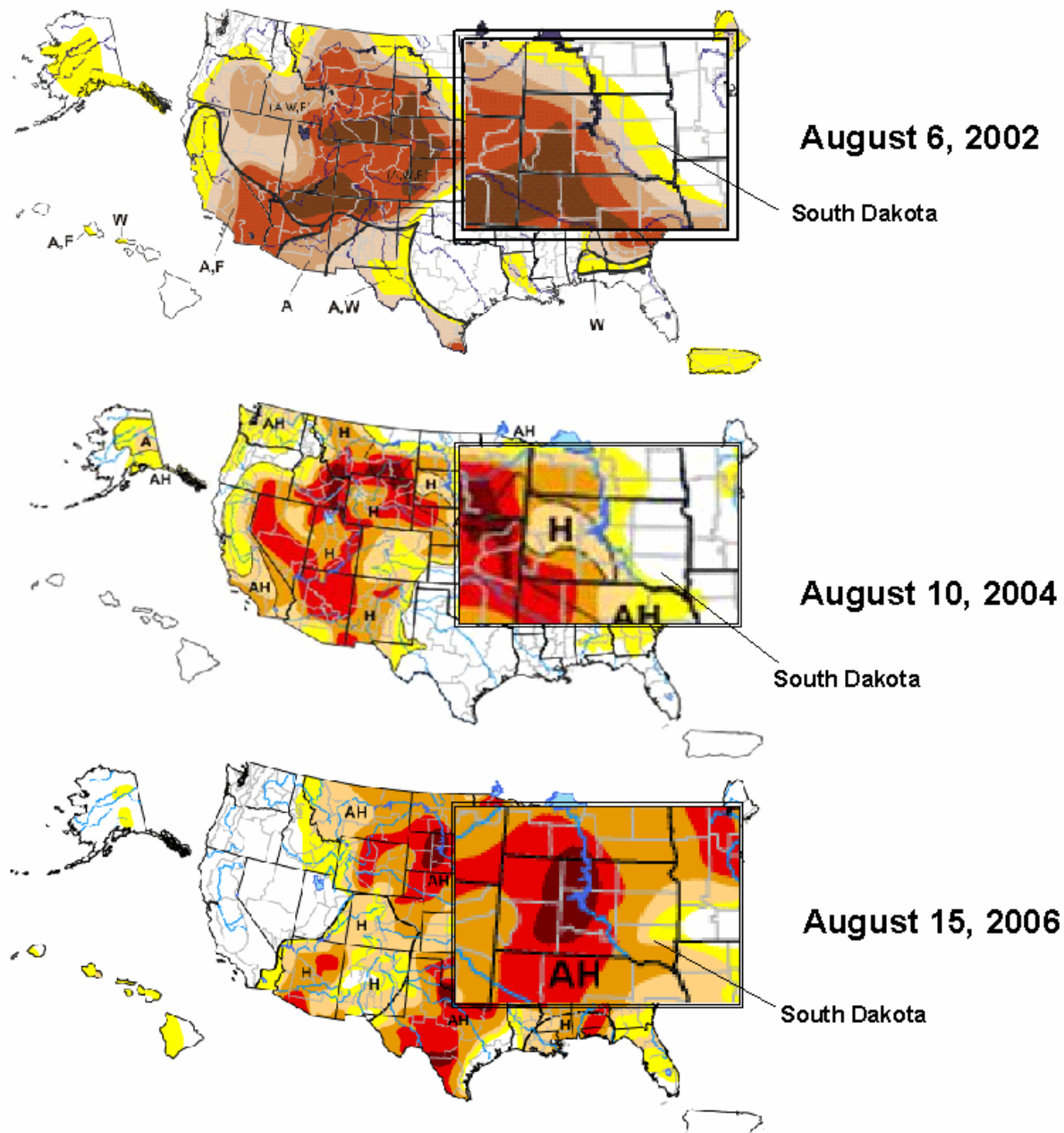


Figure 2. Drought Maps 2002, 2004, and 2006.

Sixty-one livestock producers from 26 counties submitted applications for planning and management assistance on 217,067 acres of grassland (Table 1.). These numbers do not include the 7,681 acres included in the six demonstration sites. Table 2., page 13.

Plans for 61 producers (217,067 non-demonstration acres) and the six demonstration sites (7,681 acres) were completed and ready for installation. These systems are planned to be installed during the second segment of this project. The combined number of acres contained in the demonstration and non-demonstrations systems equals 224,748.

Table 1. Non-demonstration sites Applicants Assisted with Acres Implemented.

| County | Number of Producers | Acres |
|--------------|---------------------|----------------|
| Aurora | 1 | 2,376 |
| Beadle | 1 | 2,895 |
| Brookings | 1 | 2,429 |
| Brule | 6 | 12,645 |
| Buffalo | 7 | 76,455 |
| Butte | 1 | 9,505 |
| Charles Mix | 1 | 2,040 |
| Clay | 1 | 300 |
| Faulk | 10 | 8,285 |
| Haakon | 1 | 13,000 |
| Hand | 1 | 320 |
| Hyde | 3 | 7,620 |
| Kingsbury | 1 | 720 |
| Lincoln | 1 | 217 |
| Lyman | 4 | 33,717 |
| McPherson | 1 | 5,360 |
| Meade | 2 | 16,322 |
| Mellette | 1 | 2,400 |
| Miner | 1 | 120 |
| Minnehaha | 2 | 290 |
| Moody | 6 | 3,269 |
| Pennington | 1 | 6,400 |
| Potter | 1 | 3,104 |
| Sanborn | 1 | 585 |
| Tripp | 1 | 179 |
| Turner | 2 | 191 |
| Walworth | 2 | 6,323 |
| Total | 61 | 217,067 |

Development of managed grazing systems on an additional 173,909 acres was completed as a result of project information transfer or related project activities, such as Bootstraps, NRCS-EQIP, water quality projects and applied practice follow-ups. Operations included in the total are shown in Table 2.

Table 2. Managed Grazing Systems Acres from Related Project Activities.

| County | Number of Applicants | Acres |
|--------------|----------------------|----------------|
| Brown | 1 | 800 |
| Buffalo | 1 | 86,500 |
| Charles Mix | 1 | 5,000 |
| Haakon | 2 | 5,500 |
| Hand | 1 | 480 |
| Hyde | 2 | 5,077 |
| Jones | 3 | 880 |
| Lyman | 6 | 20,590 |
| Marshall | 1 | 160 |
| Mellette | 1 | 28,000 |
| Minnehaha | 3 | 1,301 |
| Moody | 1 | 3,500 |
| Sanborn | 1 | 240 |
| Todd | 2 | 15,881 |
| TOTAL | 26 | 173,909 |

Because of a successful grazing management system designed for a Crow Creek Tribe range unit, one of the project contract range specialists was employed by the Bureau of Indian Affairs to complete resource inventories of the remainder of the tribe's grazing units.

While the project does not sell pipe, project staff assisted producers with placing orders for the one inch above ground polyethylene pipe (Figure 3.). The pipe is inexpensive, lightweight and flexible. Using the pipe, producers can install pasture subdivisions at less cost than when using buried pipe. The portability of the pipe allows the producer to try water placement in an area before they make the decision to put in a permanent system. An estimated 25,000 acres of managed grazing systems area resulted from this activity.



Figure 3. Above ground pipe and quick coupler.

Planned Milestone: Implement improved grassland management systems on 300,000 acres.

Accomplished: Managed grazing systems installed on 423,657 acres.

This number includes the 217,067 non-demonstration acres; 7,681 acres at demonstration sites; 173,909 additional managed grazing systems acres; and 25,000 acres generated by the above ground pipe sales.

Examples of the practices installed at non-demonstration operations include:

- 316,604 feet water pipeline (total = above + below ground)
- 381,215 feet cross fence (single wire, three wire high tensile electric or poly wire)
- 547 acres grass seeding/reestablishment + 43 acres to be planted during the next project segment, and
- 121 permanent and portable water tanks

Sources of funds accessed to install the BMPs include:

- North American Wetlands Conservation Act Grants (NAWCA)
- EQIP
- US Fish and Wildlife Service
- South Dakota Game, Fish and Parks
- South Dakota Soil and Water Conservation Grant (demonstration sites)
- Ducks Unlimited

Visit the project web site for information about BMPs implemented at the demonstration sites:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

Objective 2: Transfer information on grassland management to producers, researchers, grassland specialists and the public.

Task 2: Establish on-ranch demonstrations, monitor results, and evaluate impacts of improved grassland management.

Planned Milestone: Develop six on-ranch grassland management demonstrations and monitor results for evaluation.

Accomplished: Six grazing demonstration sites were developed (Table 3., page 10)
Locations of the sites are shown in Figure 4.

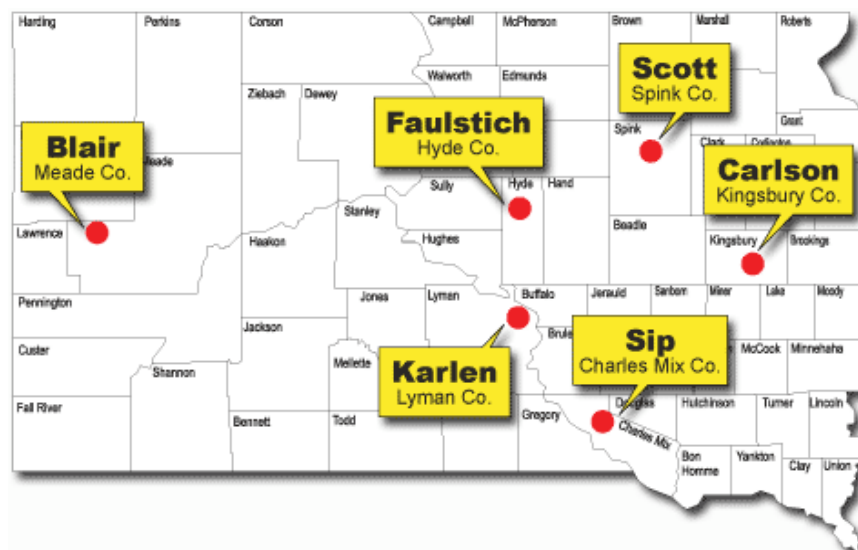


Figure 4. Map of demonstration sites.

Table 3. Demonstration Sites Established.

| Demonstration sites | Town | County | Acres | Year Established |
|---------------------|----------|-------------|--------------|------------------|
| Jim Faustich | Highmore | Hyde | 320 | 2000 |
| Merril Karlen | Reliance | Lyman | 500 | 2001 |
| Tom Scott | Ashton | Spink | 320 | 2001 |
| Blair Brothers | Sturgis | Meade | 6,125 | 2002 |
| Scott Carlson | Erwin | Kingsbury | 176 | 2002 |
| Mark Sip | Geddes | Charles Mix | 240 | 2002 |
| Total | | | 7,681 | |

The demonstration sites showcased and were used to evaluate alternative grazing systems. Water quality, wildlife presence, vegetation (plant diversity, available forage, and forage quality), soil, livestock performance, and economic parameters were monitored at each site during the grazing season. The Scott site was hayed during 2003 and discontinued as a demonstration site after that year. The Karlen site declined to continue as a site after 2003. The Blair and Carlson sites were dropped as demonstration sites when it was no longer possible to hire summer interns to complete monitoring activities.

Task 3: Complete information and education activities on grassland management with emphasis on riparian grassland areas and the impact improved grassland management will have on water quality.

Planned Milestone: 50,000 hits on a grazing web site.

Accomplished: 180,406 hits on web site.

The project web site is located at:

<http://www.sdconservation.org/grassland/>

The site includes information about:

- South Dakota grasslands
- Grassland health
- Grassland management
- The six developed demonstration sites
- Links to other grazing related web sites
- An option for an online request for assistance

The site visits increased each year (Table 4.). The site was periodically updated and expanded to better serve producer and resource manager grassland information needs.

Table 4. Total Website Hits July 1, 2001-June 30, 2007.

| Time Period | Projected | Actual |
|-----------------------|------------------|----------------|
| July 2001-March 2003 | 19,000 | 15,456 |
| April 2003-March 2004 | 10,000 | 25,464 |
| April 2004-March 2005 | 10,000 | 39,228 |
| April 2005-March 2006 | 10,000 | 42,533 |
| April 2006-June 2007 | 1,000 | 57,725 |
| TOTAL | 50,000 | 180,406 |

Planned Milestone: See Table 5., Grassland management information transfer and education outreach activities.

Accomplished: (see Table 5., for comparison between planned products & accomplished)

Table 5. Comparison of Planned Product & Accomplishments.

| Outreach Activities & Milestones | Planned | Completed |
|---|----------------|------------------|
| On-Ranch Tours | 15 | 32 |
| Audience | 750 | 1,517 |
| Media Events | 15 | 51 |
| Audience | 750,000 | 2,186,979 |
| Video-Produce Video | 1 | 1 |
| Audience | 200,000 | 180,000 |
| Workshops | 9 | 27 |
| Audience | 450 | 1256 |
| Grazing Schools | 4 | 4 |
| Audience | 140 | 105 |

Opportunities to learn about the project and the environmental and economic benefits of managed grazing were provided to over 2,000,000 individuals. The total includes estimated booth traffic at events (conferences, trade shows, etc.); attendance at field days, workshops, and meetings; circulation of periodicals and radio station market size.

Field days at the sites were held from 2001 through 2007 to transfer information to producers and resource managers about the benefits of BMPs and management practices used on the systems. Over 1,500 farmers, ranchers, and resource managers attended the tours and field days held during the project period 2001 – 2007 (Table 6.).

Table 6. Project Tours

| <i>Tour Site</i> | <i>Date</i> | <i>Number Attending</i> | <i>Comments</i> |
|--------------------|-----------------|-------------------------|---|
| Bien | July, 2006 | 65 | SD Grasslands Bus Tour |
| Blair | July, 2002 | 50 | Joint SRM/Coalition Tour |
| | May, 2003 | 15 | EPA Tour, EPA Project Officer Attended |
| | July, 2004 | 85 | SD Grasslands Bus Tour |
| Faulstich | July, 2001 | 60 | Project Progress Tour |
| | June, 2002 | 35 | Project Progress Tour |
| | June, 2003 | 30 | Ag Lender's Range Camp |
| | June, 2003 | 15 | Cenex Harvest States Nutritionists |
| | July, 2003 | 85 | SD Grasslands Bus Tour |
| | September, 2005 | 15 | SDSU Range Class |
| | June, 2006 | 40 | Indiana Producer Group |
| | July, 2006 | 7 | Ukraine Group |
| Jessop | June, 2004 | 40 | Tour at Coordinator's Ranch |
| | June, 2005 | 30 | Ag Lender's Range Camp |
| | July, 2005 | 60 | SD Grasslands Bus Tour |
| | September, 2006 | 25 | SDSU Range Class |
| Karlen | August, 2001 | 60 | Project Progress Tour |
| | October, 2001 | 50 | Project Progress Tour |
| | August, 2002 | 25 | EPA Tour, EPA Project Officer Attended |
| | July, 2003 | 85 | SD Grasslands Bus Tour |
| | September, 2003 | 40 | SD Grazing School Tour |
| Kieffer | July, 2004 | 85 | SD Grasslands Bus Tour |
| | June, 2007 | 45 | Birds. At Home on the Range Tour |
| Nature Conservancy | July, 2006 | 65 | SD Grasslands Bus Tour |
| Nagel | June, 2007 | 20 | Sponsorship |
| Scott | August, 2001 | 50 | Project Progress Tour |
| Sip | June, 2002 | 20 | Project Progress Tour |
| | July, 2003 | 85 | SD Grasslands Bus Tour |
| Smith | July, 2006 | 65 | SD Grasslands Bus Tour |
| Steffen | July, 2003 | 85 | SD Grasslands Bus Tour |
| Rasmussen | July, 2005 | 60 | SD Grasslands Bus Tour |
| Flandreau Area | July, 2005 | 20 | Conservation District Tour of People the project Staff Assisted |
| Total | | 1,517 | |

A summary of tour/field day activities follows:

- Nearly 200 producers and resource managers attended field days at the Faulstich, Karlen, and Scott sites in operation during 2001. Attendance at field days held at the Faulstich, Karlen, Blair, and Sip sites during 2002 totaled 150. The Karlen demonstration site, located north of Reliance, South Dakota, was used as a field workshop site for the 2001 South Dakota Section of the Society for Range Management annual meeting. See the Task 2, Product 3 and the Overall Project Accomplishments section of this report for additional information.
- Through the South Dakota Grasslands Coalition's efforts, two *Dick Diven* low cost cow/calf classes were held August 2003 (20 attendees) and August 2005 (9 attendees) in Pierre, South Dakota. Producers from Canada, Minnesota, Nebraska, North Dakota, and South Dakota attended. Diven emphasized synchronizing calving with nature (May/June time frame), winter grazing on stock-piled forage as opposed to confined feeding, and precision nutrition. The winter grazing spreads manure across a pasture instead of confining it to winter feeding areas. After grass samples are analyzed, mineral supplements are formulated to ensure a balanced diet. The school promoted the use of grazing and forage analysis as tools for balancing nutrients and achieving economic success. Balancing nutrients lowers phosphorus levels in manure and winter grazing, as an alternative to area feeding, broadly distributes manure. Both practices reduce phosphorus-loading of surface water. Fifteen producers were awarded \$100 scholarships through a grant to the Coalition from USDA-NRCS. The scholarships helped offset the \$495 tuition cost for the first producer and \$395 for each additional person from an operation who attended.
- During 2003, the South Dakota Grasslands Coalition hosted a two-day bus tour of three of the demonstration sites and a fourth ranch which is not involved with the Grasslands Management and Planning Project. The fourth ranch is owned by Dave Steffen, a rancher, range consultant, and retired NRCS Range Conservationist. Two tour buses were used to transport tour attendees to the demonstration sites. The South Dakota Grassland Coalition was awarded a Sustainable Agriculture Research & Education (SARE) Grant for the tour. In addition, the National Grazing Lands Conservation Initiative paid for one bus. Seventy-five people rode the buses at each stop, an additional five to ten local persons joined the tour. The project coordinator was interviewed by KGFX and KWYR radio stations, as well as the radio show, "Dakota Farm Talk." In the interviews, the coordinator promoted the tour and the technical assistance available from the project.
- During 2004, The South Dakota Grasslands Coalition hosted a two-day bus tour in the Rapid City area. One of the tour stops was north of Sturgis, South Dakota. Participants also visited the Mark Kieffer ranch which is located in the Black Hills on USDA-Forest Service land. Kieffer is a director on the South Dakota Grasslands Coalition. Jim Gerrish, a well-known pasture management specialist, was the featured speaker for the tour. Gerrish was available for questions during the tour and gave presentations the evening of July 20, and the afternoon of July 21. The South Dakota Grasslands

Coalition funded the tour using funds provided through a partnership contribution agreement with the USDA-NRCS. Eighty-five people attended the tour. Each tour participant received a copy of *Grasslands Plants of South Dakota and the Northern Great Plains* book and a grazing stick.

- July 19 and 20, 2005, the South Dakota Grassland Coalition hosted a bus tour of South Dakota Grasslands Coalition board member Dan Rassmussen and the Jeff Jessop ranch. Rassmussen and brother-in-law, Blake Lehman, use low stress weaning, the Diven low-cost cow/calf management program, and rotational grazing and drought management. The Jessop ranch is a custom yearling grazing business. Some of the topics discussed included the mechanics of moving a large herd of yearlings (up to 2,500 head in one herd) and watering large herds in a rotational grazing program. The tour was featured on the front page of the July 26, 2005, edition of the Sioux Falls *Argus Leader*. See Appendix A “Ranching Ideas Find Converts”.
- The 2006 South Dakota Grasslands Coalition Bus Tour was held July 18 -19 (Figure 5.). Stops included Fort Sisseton, the Neil Bien Ranch located near Veblen, the Nature Conservancy’s 7-mile Fen ranch located near Clear Lake, and the Rick Smith ranch located near Watertown. The Environmental Law Institute awarded Bien their 2005 Landowner Stewardship National Wetlands Award. Smith is an International Society of Range Management award winner as well as the Lake Poinsett Watershed project coordinator. See Appendices B and C articles, “Lifetime Managers” and Cattle Business Weekly of July 27, 2006.



Figure 5. Producers attending a project event discuss what they learned. Photo courtesy of *Cattle Business Weekly*

- The South Dakota Grasslands Coalition tour, “Birds At Home on the Range,” was held June 8 - 9, 2007. Forty-five individuals attended the event, which was held in the Black Hills area to provide information that demonstrates the relationship between land

stewardship and grassland wildlife to a cross section of the citizen groups. See Appendix D Bird Tour Brochure and Appendix E Bird Tour Article published in Cattle Business Weekly June 13, 2007.

- USDA- Natural Resources Conservation Service in South Dakota nominated Jim Faulstich for the 2006 National Cattlemen's Beef Association (NCBA) Region VII Environment Stewardship Award. Although Faulstich did not receive the award, the nomination was endorsed by South Dakota Association of Conservation Districts, South Dakota Section-Society of Range Management, and the South Dakota Grasslands Coalition. The 2006 region 7 winner, Gabe Brown of North Dakota, is scheduled to speak at several project programs during segment two of the project. See Appendix F for copy of Faulstich nomination.
- The SD Grasslands Coalition Sponsored six Holistic Resource Management (HRM) Workshops across the state during February 2004, and another six during spring 2007. Three hundred forty five people attended 12 events.

News Articles

News releases about the project field days and tours were printed by approximately 20 different newspapers and three agricultural trade papers. Dates, publications, subject and circulation of the publication are shown in Table 7, page 16.

Table 7. Project Related News Articles

| Date | Publication | Subject | Circulation |
|-------------------|-------------------------------|---|--------------------|
| June 21, 2002 | Tri-State Neighbor | Sip Tour | 28,000 |
| August 1, 2003 | Charles Mix News | 2003 Bus Tour | 686 |
| August 2, 2003 | Gregory Times | 2003 Bus Tour | 2,132 |
| August 3, 2003 | Huron Plainsmen | 2003 Bus Tour | 6,000 |
| August 4, 2003 | Mitchell Daily Republic | 2003 Bus Tour | 12,447 |
| August 5, 2003 | Pierre Capitol Journal | 2003 Bus Tour | 3,979 |
| August 6, 2003 | Platte Enterprise | 2003 Bus Tour | 1,954 |
| August 8, 2003 | Sioux Falls Argus Leader | 2003 Bus Tour | 60,000 |
| March 25, 2004 | Dakota Farmer | Article About Lavern Koch & Mark Kieffer, SD Grasslands Board Members | 30,000 |
| July 26, 2005 | Sioux Falls Argus Leader | 2005 Bus Tour | 60,000 |
| September 1, 2005 | Beef Magazine | Amazing Grazing Efforts | 100,000 |
| April 22, 2006 | Sioux Falls Argus Leader | Larry Wagner, Grass Fed Beef | 60,000 |
| May, 2006 | Cattle Business Weekly | Changes for the Better | 13,000 |
| July, 2006 | Sioux Falls Argus Leader | 2006 Bus Tour | 60,000 |
| August, 2006 | Tri-State Neighbor | 2006 Bus Tour | 28,000 |
| August, 2007 | Agweek | 2006 Bus Tour | 26,000 |
| May, 2007 | Cattle Business Weekly | NRCS Award | 13,000 |
| May, 2007 | Farm Forum | NRCS Award | 26,000 |
| May, 2007 | Farm Market News and Auctions | Organic Grassfed Beef | 3,126 |
| June 2007 | Cattle Business Weekly | 2007 Bird Tour | 13,000 |

An article about the Jim Faulstich Ranch appeared in the September-October 2001 issue of GLCI News (Grazing Lands Conservation Initiative). The article is available at the GLCI website:

<http://www.glci.org/images/GLCI%20Newsletters/Sept-Oct%202001/SeptOct2001Page3.jpg>

The South Dakota Grasslands Coalition, in cooperation with its project partners, published a grazing guidebook titled *Greener Pastures* (Figure 6.). See Appendix G for a copy of the guidebook. The guide contains the following information:

- Why managed grazing?
- General principles
- Choosing a grass species
- Water quality
- Grazing riparian areas
- Native and introduced grasses
- Cool and warm season grasses
- Wildlife
- Grazing systems
- Designing a program
- When and how much to graze
- Monitoring success
- Demonstration sites
- Contact information

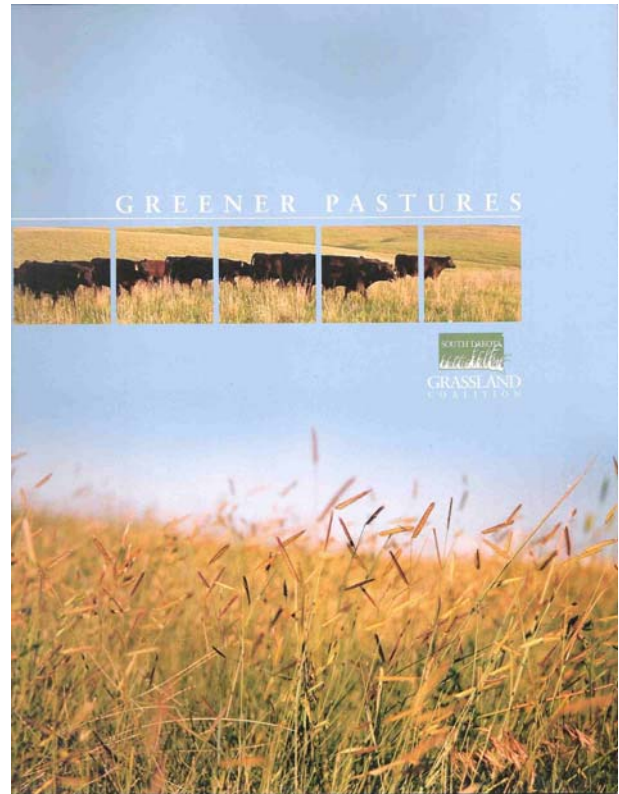


Figure 6. Greener Pastures.

Radio Interviews

Seven radio interviews were conducted when pertinent to the project activities.

- South Dakota Grassland Coalition chair Mark Sip on WNAX
- Project Coordinator on *Dakota Farm Talk* (12 stations)
- Project Coordinator on KWYR, Winner, discussing 2003 Bus Tour
- Project Coordinator on KGFX, Pierre, discussing 2003 Bus Tour
- Project Coordinator on KWYR promoting 2006 Bus Tour
- Grazing school staff on KWYR, promoting 2006 Grazing School
- May, 2007, My Daily News, KGFX, Pierre, broadcast about the South Dakota Grasslands Coalition's Excellence in Conservation Award

Television Programming and Training Video Production

A five segment program was produced and aired for television (*Today's Ag*). The Segments were used to produce an informational / training video. The program was aired on November 7 and 14, 2004 (approximately 90,000 viewers each segment). Five hundred videos and five hundred DVDs were produced. Copies of the videos were sent to 77 NRCS offices, conservation district offices and 95 vocational agricultural teachers in the state. NRCS shows the video in their introductory range planning class.

The video provides the livestock industry and general public with information about managed grazing and how the practices protect the environment while improving producer profitability. The video may be viewed by clicking on “Grassland Management Video” after accessing:

<http://www.sdgrass.org/links.html>

Event Displays

Displays promoting the grazing project were set up at the following events:

- 2002, 2004, 2005 and 2006 Black Hills Stock Show (estimated booth traffic: 1,200,000 persons)
- Rancher workshops in White River (2002 and 2007), Vermillion (2005), Mission (2004), Miller (2004), and Presho (2002); (600 total attendance)
- 2001, 2002, 2003 South Dakota Cattlemen’s Association Convention (625 total attendance)
- 2002 SDACD Convention (296 attendance)
- 2004 and 2005 DakotaFest (70,000 total attendance)
- 2003 and 2006 National Grazing Lands Conservation Initiative Conference (2,100 total attendance)

PowerPoint Presentations

A PowerPoint presentation about the project was developed (see Appendix H). The presentation focused primarily on the project’s six managed grazing demonstration sites. See Table 8., page 19 for list of locations and events of the presentations.

Dave Steffen, a rancher, range consultant, and retired NRCS Range Conservationist presented “Coping with Drought” to the Highmore Bootstraps group (see Appendix I). The presentation for the Rancher’s Workshops in Highmore and Gettysburg and the Bootstraps meeting in Oacoma focused on the watering system that the coordinator and his brother use on their ranch (see Appendix J).

Table 8. Presentations About the Project

| Date | Event | Location | Attendance |
|--------------------------|---|-----------------|-------------------|
| May 2002 | USDA-Forest Service Range Conservationists meeting | Pierre, SD | 109 |
| September 2002 | South Dakota Association of Conservation Districts convention | Pierre, SD | 40 |
| October 2002 | South Dakota Ornithological Society meeting | Rapid City, SD | 40 |
| December 2002 | Tatanka RC&D meeting | Bison, SD | 26 |
| January 2003 | Bootstraps meeting | Chamberlain, SD | 20 |
| February 2004 | North Dakota/South Dakota Joint Projects Coordinator meeting | Bismarck, ND | 20 |
| March 2004 | Bootstraps meeting | Highmore, SD | 20 |
| March 2004 | South Dakota Project Coordinators meeting | Pierre, SD | 25 |
| November & December 2004 | Lake Faulkton watershed meeting | Faulkton, SD | 30 |
| January 2005 | Rancher's Workshop | Highmore, SD | 30 |
| February 2005 | Rancher's Workshop | Gettysburg, SD | 30 |
| September 2005 | Rancher's Workshop | Vermillion, SD | 25 |
| September 2005 | Nonpoint Source Task Force meeting | Pierre, SD | 40 |
| December 2006 | Bootstraps meeting | Oacoma, SD | 55 |

Planned Milestone: Four grazing schools with 150 students

Accomplished: Four grazing schools with 105 students, see Table 9.

Table 9. Attendance at Grazing Schools.

| Year | Date | Attendance |
|-------------|----------------|-------------------|
| 1 | September 2003 | 36 |
| 2 | September 2004 | 28 |
| 3 | September 2005 | 23 |
| 4 | September 2006 | 18 |
| | Total | 105 |

On September 9 – 11, 2003, a 2 ½ day grazing school for grassland managers was held in Oacoma, South Dakota. Thirty-six grassland managers attended; nine of those represented agencies such as USDA-NRCS, tribes, USDA-CES (Extension), and the Nature Conservancy. The school included both classroom and field learning experiences. The classroom segments included presentations from grassland managers and Extension and agency personnel about the benefits of Management Intensive Grazing (MIG) as well as nutrition requirements of livestock. Bob Budd, Society for Range Management (SRM) president, was the keynote speaker.

On the first night, a ranchers' panel was held with four ranchers: Neil Bein of Veblen, SD; Ed Blair of Sturgis, SD; Jim Faulstich of Highmore, SD; and Bob Budd of Lander, WY. The field exercises included a pasture allocation activity. Working in groups, the school participants constructed a paddock using poly-wire and plastic posts to build a paddock that would provide three, four, five heifers enough forage for one day. On day two, the paddocks were evaluated and the students made adjustments for the next 24 hour grazing period. After dinner on the second night, attendees were encouraged to ask questions of the various presenters with questions specific to their operations. On day three, the final evaluations of the pasture allocation exercise were made. Ecological sites, grazing systems, fencing, water systems, water cycle, and mineral cycle were some of the topics covered during the classroom and field exercise sessions. A field trip to the Karlen demonstration site was also included in the school.

A second grazing school was held in Oacoma, South Dakota, for grassland managers September 14 – 16, 2004. Of the 30 in attendance, ten represented agencies. Twenty-eight grassland managers attended the school with approximately the same mix of agency personnel and ranchers as the previous year. The Lower Brule BIA sent seven people to the grazing school: three agency people, one tribal ranch manager, and three of their tribal range unit lessees. The school was structured in the same format as the 2003 school which included both classroom and field instruction Jim O'Rourke, past President of Society for Range Management (SRM), was the keynote speaker. Jim Faulstich, a demonstration site cooperator of Highmore, South Dakota, gave a speech on the importance of goal setting for ranch management.

The 2005 grazing school followed the same structure as the previous years. Faulstich discussed setting management goals.

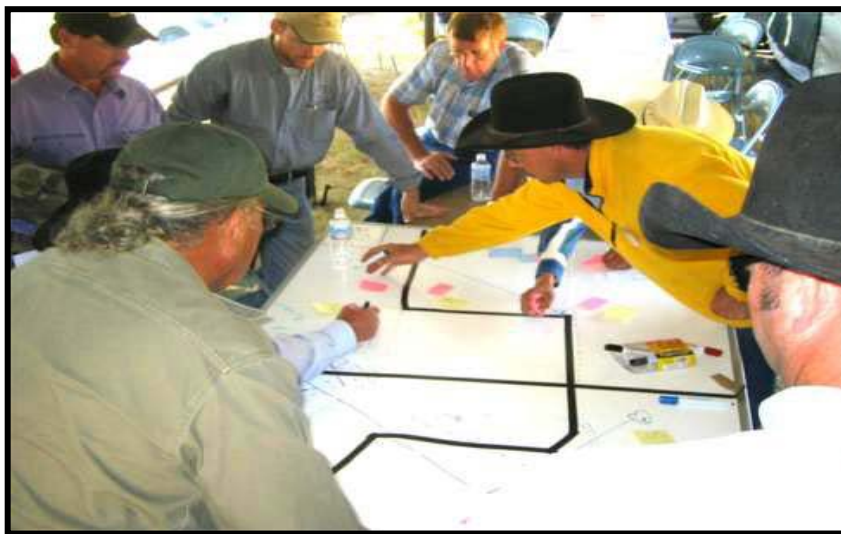


Figure 7. 2005 Grazing school attendees designing a grazing system.

While a pasture allocation was standard practice during the grazing schools, a new exercise was added in the 2005 school. Participants were given a dry erase board displaying various features depicting a ranch, including a headquarters, creeks, and a road (Figure 7.) Group members were directed to design a grazing system (fence, water, and grazing sequence) that would help restore the

ranch's warm season grass component. The exercise generated individual involvement and effective group interaction, far surpassing that which was demonstrated during the pasture allocation exercise.

The 2006 South Dakota Grazing School held at Oacoma, SD, September 12 – 14 employed the same format of the grazing schools as the previous years, including the grazing system design activity introduced in 2005. Refer to Figures 8. and 9. for pictures of the grazing allocation exercise.



Figure 8. Attendees at the 2006 grazing school set up paddocks.

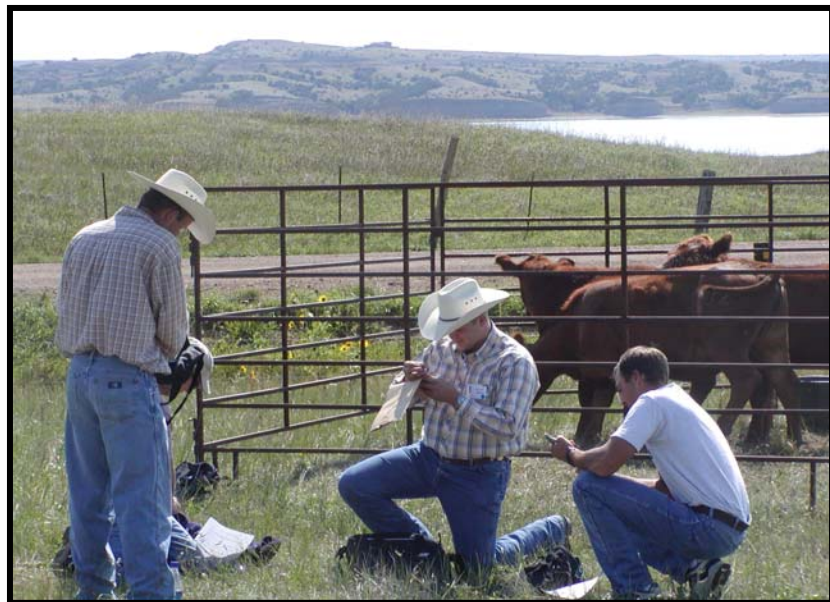


Figure 9. 2006 grazing school attendees calculate grazing allocations.

The grazing school students also toured a pasture on Larry Wagner's ranch; see Figure 10., page 22. There, Wagner (black hat) restored warm season plants using prescribed burns. Pete Bauman (far

right) Nature Conservancy in Clear Lake, discussed prescribed burning. Wagner served as a director of the Coalition.



Figure 10. Discussion of prescribed burn at Wagner Ranch.

The South Dakota grazing school instructors and the Grasslands Coalition Board met December 2006 to review and improve the grazing school. One outcome was a vision statement: “To give the grazing lands managers of South Dakota the tools to maintain healthy prosperous families, and diverse ecosystems, and profitable livestock operations while contributing to the well-being of communities.” The committee asked the speakers to submit an outline of their presentations so consistency could be maintained among the speakers. The Committee also encouraged the presenters to be at the school as long their schedule allows, thereby being available for further questions and maintaining consistency.

Objective 3: Provide for the day-to-day project administration and oversight.

Task 4: Ensure all activities, reporting requirements, personnel actions, and financial obligations associated with the project are complete and the terms in all agreements are in compliance.

Planned Milestone: Management agreement with the South Dakota Association of Conservation Districts.

Accomplished: Management agreement with the South Dakota Association of Conservation Districts.

During July 2001, the Grasslands Coalition and American Creek Conservation District (encompassing Lyman County) entered a management agreement with the South Dakota Association of Conservation Districts for administration of the project. The American Creek

Conservation District was a party to the agreement since their South Dakota Soil and Water Conservation Grant from the South Dakota Conservation Commission provided additional funds for the demonstration sites. Under terms of the agreement the Association provided administrative, financial, and personnel management services. A project team, with representation from each party to the agreement, met periodically to review project progress, rank requests for assistance, and provide direction to the Association.

An advisory committee made up of representatives from project partner agencies and organizations was formed to keep the partners apprised of project activities, recommend future activities and coordinate joint efforts. The committee met three times over the course of the project. A detailed list of the members can be found under “Coordination Efforts.”

Best Management Practices Developed and/or Revised

The development and/or revision of best management practices was not included in or added to the project implementation plan.

Coordination Efforts

A project advisory team was formed to assist the Coalition with management, coordination of assistance, prioritization of requests, selection of demonstration sites and the transfer of information through existing extension, conservation districts, and NRCS networks.

The team was a partnership of ranchers and producers, researchers, agency specialists, and agricultural organizations. The advisory team met three times during the project period.

Advisory team members and organizations invited include:

- South Dakota Stockgrowers Association
- South Dakota Cattlemen’s Association
- USDA – Natural Resources Conservation Service
- South Dakota State University
- Ducks Unlimited
- South Dakota Department of Environment & Natural Resources
- South Dakota Department of Game, Fish & Parks
- USDI - Fish and Wildlife Service
- South Dakota Section of the Society for Range Management
- South Dakota Department of Agriculture
- Pheasants Forever
- South Dakota Grassland Coalition
- USDA – NRCS Resource Conservation and Development Councils
- South Dakota Ornithologist Society
- South Dakota Nature Conservancy

The USDA Natural Resources Conservation Service recognized the partnership efforts undertaken by this project when Chief Lancaster awarded the project sponsor the Agency's "Excellence in Conservation Award." See Figure 11. The project sponsor and staff were also recognized by Region 8 US Environmental Protection Agency with Environmental Achievement Awards. See Figure 12.

Excellence in Conservation Award Given to Grassland Group

"The South Dakota Grassland Coalition was given a national award yesterday during a ceremony at the state capitol rotunda. The U.S. Department of Agriculture's Natural Resources Conservation Service Chief Arlen Lancaster was in Pierre to present the award to the non-profit group, which works to improve privately owned grasslands in the state. Lavern Koch of New Underwood is the Chairman of the South Dakota Grassland Coalition and says the organization is made up of one hundred members who are trying to protect native grasslands and bring attention to their importance through a variety of efforts.

Koch says the SDGC sponsors several activities throughout the year that put a focus on South Dakota's grasslands and grazing management.

The Excellence in Conservation Award is handed out once a year." (Source: http://www.dakotaradiogroup.com/mydailynews/MDNThursdayMay_3.htm)



Figure 11. South Dakota Grassland Coalition Board of Directors with USDA-NRCS Chief Arlen Lancaster, USDA-NRCS SD State Conservationist Janet Ortle, and South Dakota Secretary of the Department of Agriculture Bill Even.

Environmental Protection Agency Region 8 Environmental Achievement Award

The South Dakota Grasslands Coalition received the Environmental Protection Agency's Region 8 Environmental Achievement Award in 2007.

Robert (Robbie) Roberts, US EPA region 8 administrator, presented Lavern Koch, South Dakota Grasslands Coalition Chairman, the award. Also receiving awards were Justin "Judge" Jessop, Project Coordinator for the Grasslands Management and Planning Project, and Dave Steffen, a rancher, range consultant, and retired NRCS Range Conservationist. Steffen was also involved in the initial stages of the Grasslands Management and Planning Project.



Figure 12. Chairman Koch accepting the Environmental Achievement Award from Robbie Roberts, EPA Region 8 Administrator.

Summary of Public Participation

Opportunities to learn about the project and the environmental and economic benefits of managed grazing were provided to over 2,000,000 individuals. The total includes estimated booth traffic at events (conferences, trade shows, etc.); attendance at field days, workshops, and meetings; circulation of periodicals and radio station market size. Many of those attending expressed interest in learning more about grassland resources or opportunities to improve grazing management on their grasslands.

Field days at the sites were held from 2001 through 2007 to transfer information to producers and resource managers about the benefits of BMPs and management practices used on the systems. Over 1,500 farmers, ranchers, and resource managers attended the tour and field days during 2001 – 2007

Aspects of Project that did not Work Well

The demonstration sites experienced difficulties, primarily due to lack of strong producer buy-in and struggles to secure summer interns. The initial project liaison from SD State University left for a position in Texas. Several changes in the liaison assigned affected hiring qualified college interns.

Initially, the producers at the demo sites expressed enthusiasm and demonstrated involvement in the project. However, several producers chose not to participate further in the demonstration sites after college interns were not available to assist with the monitoring activities. One producer was forced to withdraw due to multi-generational farming/family related issues. One producer altered his management program to the extent it did not demonstrate grazing practices; therefore, the Coalition withdrew the site from the project.

Future Activity Recommendations

As evidenced by the increasing number of participants in outreach activities and demand for the technical assistance to provide grazing management inventories and plans, it is recommended these activities continue to be provided.

Website hits increased each year, beginning with about 15,000 hits the first year to over 57,000 hits the final nine months of the project. Those attending the grazing school uniformly recommended continuing the activity and indicated they would encourage others to attend.. The project conducted twice as many tours as planned with double the attendance. Workshops tripled from what was planned with triple the planned attendance.

In the first year of the project, producers were sought to participate. Today, producers seek the project to request participation.

Project Budget and Expenditures

The Grasslands Management and Planning Project received a \$500,000.00 EPS Section 319 Grant through South Dakota Department of Environment and Natural Resources. The project budget is shown in Table 10., page 27. Funds were moved from five categories to five other categories with no increase in total budget.

Table 10. Project Budget and Expenditures

| Item | Budget | Budget Adjustment | Expenditures | Non Federal | Other Federal | 319 |
|---------------------------------------|---------------|--------------------------|---------------------|--------------------|----------------------|------------|
| Personnel | | | | | | |
| Range Specialist/ Project Coordinator | 208,100 | | 306,340.12 | 40,654.41 | 66,490.40 | 199,195.31 |
| Payroll Taxes | 0.00 | | 22,434.82 | 2,686.37 | 4,510.70 | 15,237.75 |
| Retirement Contributions | 0.00 | | 7,387.42 | 149.84 | 1,960.29 | 5,277.29 |
| Information Specialist | 27,380 | | 37,530.34 | 7,081.00 | 6,464.33 | 23,984.71 |
| Support Staff | 0.00 | | 794.64 | 796.64 | 0.00 | 0.00 |
| Range Consultant Fees | 72,920 | -5,000 | 66,211.35 | 2,215.40 | 3,780.00 | 60,215.95 |
| Range Consultant Expenses | 0.00 | | 9,593.19 | 784.60 | 398.72 | 8,409.87 |
| Seasonal Employees/Interns | 16,000 | -4,000 | 23,444.07 | 7,602.06 | 0.00 | 15,842.01 |
| Personnel Management Exp | 0.00 | | 4,537.53 | 0.00 | 444.79 | 4,092.74 |
| Demo site Consultant | 0.00 | | 2,000.00 | 0.00 | 0.00 | 2,000.00 |
| Operations | | | | | | |
| Office Supplies | 14,750 | +5,000 | 26,897.09 | 325.00 | 13,383.91 | 13,188.18 |
| Postage | 1,885 | | 1,931.12 | 0.00 | 785.48 | 1,145.64 |
| Cell Phone | 5,000 | | 3,279.73 | 0.00 | 1,156.50 | 2,123.23 |
| Computer Main/Lease/Software | 5,500.00 | +500 | 6,371.85 | 0.00 | 150.00 | 6,221.85 |
| Travel | | | | | | |
| Vehicle Lease | 15,000 | | 29,688.67 | 0.00 | 6,875.00 | 22,813.67 |
| Vehicle Operation | 18,750 | -5,000 | 23,353.97 | 1,038.65 | 5,940.50 | 16,374.82 |
| Vehicle Operation/Insurances | 5,235 | | 6,581.04 | 0.00 | 1,250.00 | 5,331.04 |
| Employee Insurance | 5,000 | | 28,758.48 | 0.00 | 10,076.85 | 18,681.63 |
| Employee Expenses | 5,250 | +5,000 | 10,902.69 | 463.31 | 102.00 | 10,337.38 |
| Equipment | | | | | | |
| Camera | 600 | | 660.98 | 0.00 | 0.00 | 660.98 |
| Monitoring | | | | | | |
| Livestock Weighing | 8,100 | | 2,500.00 | 2,350.00 | 0.00 | 150.00 |
| Water Quality Samples | 20,600 | -500.00 | 3,832.00 | 700.00 | 0.00 | 3,132.00 |
| Quality Control | 2,430 | | 80.00 | 0.00 | 0.00 | 80.00 |
| Soil Tests | | +500.00 | 178.75 | 0.00 | 0.00 | 178.75 |

| | | | | | | |
|-------------------------|-----------|-----------|-----------|--------------|---------|--------------|
| Information & Education | | | | | | |
| Video | 25,000 | +4,000.00 | 36,586.69 | 6,000.00 | 0.00 | 30,586.69 |
| Web Site Maintenance | 7,000 | -500.00 | 2,575.63 | 1,322.73 | 0.00 | 1,252.90 |
| Administration | 25,000 | | 36,919.61 | 3,525.00 | 0.00 | 33,394.61 |
| Total | 1,188,907 | | 2,359,425 | 1,188,907.00 | 868,735 | 1,170,518.30 |
| Match | | | | 451,091.39 | | |

9.0 Monitoring Activities

Several parameters were monitored as part of the evaluation of the six demonstration sites. Water quality improvements attributable to changes in grazing management at non-demonstration sites were not documented. Collected data was compiled for analysis by South Dakota State University. Drought conditions prevented the completion of all planned monitoring activities, thereby causing need to alter the monitoring plan.

Parameters monitored include:

- Demonstration Sites:
 1. Surface Water Quality – changes in water quality
 2. Fecal Samples – forage consumption and quality
 3. Plant Community Health – production, availability, cover, diversity
 4. Livestock Performance – weight gain, body condition, pregnancy rates
 5. Habitat Improvement – bird population changes
 6. Soil Quality – nutrient levels and infiltration rates

Additional information on demonstration site monitoring is available at:

<http://www.sdconservation.org/grassland/managing/gmd/projects.html>

SDSU was contracted to analyze the data from the demonstration sites (Appendix K). As stated in the summary, “Recent droughts in South Dakota have had negative impacts on vegetative composition and water quality and quantity. Good grassland management stabilizes forage production and thereby improves the efficiency of the water cycle by reducing runoff; however it can make stock dams a less reliable water source.” Another conclusion from the report was, “... We observed low recovery of water quantity at the Faulstich site during high winter and spring precipitation years compared to stock dams in continuous grazing systems around the region. We suspect that leaving more residual forage increased infiltration and reduced runoff. Therefore, using a MIG system at moderate stocking rates probably resulted in a more efficient water cycle. Reliable and flexible watering systems of a MIG system alleviate the need to use unreliable stock

dams. Fencing out stock dams, allows producers an opportunity to create excellent wildlife habitat.”

Conclusions

When activities completed to date are compared with established workplan milestones (Table 11.), the project can be evaluated as completed on schedule, even though planning and implementation of grazing systems was delayed, primarily due to drought conditions.

Table 11. Comparison of Planned vs. Accomplished Milestones

| Milestone | Planned | Accomplished |
|---|--------------------------|---|
| Planning of grassland management systems | 75 plans @ 150,000 acres | 61 plans @ 217,067 acres |
| Implementation of grasslands management systems | 300,000 acres | 423,657 acres |
| Fencing | 105,000 LF | 331,215 LF |
| Pipeline | 50,000 LF | 291,604 LF |
| Wells | 10 | 1 - less expensive water sources such as rural water were used |
| Tanks | 30 | 109 |
| Pasture pumps | 5 | 0 - producer need not evidenced |
| Dugouts/dams | 10 | 0 - field activity determined dams not to be reliable source of water and planned for pipelines and tanks |
| Grass seeding | 250 acres | 227 acres |
| Demonstration sites | 6 at 5,000 acres | 6 @ 7,681 acres |
| Web site & hits | 1 @ 50,000 hits | 1 @ 180,406 hits |
| Tours | 15 @ 750 | 32 @ 1,517 |
| Media events | 15 @ 750,000 contacts | 51 @ 2,186,979 contacts |
| Video | 1 @ 200,000 contacts | 1 @ 180,000 contacts |
| Workshops | 9 @ 450 contacts | 27 @ 1,256 contacts |
| Grazing schools | 4 @ 150 students | 4 @ 105 students |
| Administration & oversight | 1 | 1 |

Six demonstration sites were developed ahead of schedule. Due to various factors, four of the sites were discontinued. The development and implementation of managed grazing plans is in progress on over 423,000 acres of grassland. The project web site visitor hits grew each year and exceeded their milestones. Total outreach program contacts exceeded the project’s milestones. BMPs implemented on non-demonstration sites are included in Table 12.

During this segment of the project, an accepted evaluation method for determining load reductions from grazing systems was not available. However, load reductions will be calculated in segment two of this product using a method approved by DENR. Producers and resource managers

demonstrated strong acceptance of planned grazing as a viable practice for sustaining operations and protecting the environment. The project also experienced support from wildlife and environmental agencies and organizations.

Using the activities developed, program efforts are expected to continue to bring grassland acres under active grazing management plans, resulting in improved range conditions that will lead to improved water quality across the state.

As stated in the SDSU Report (Appendix K) evidence suggests runoff from well managed grasslands is low. Historically, dams and dugouts get recharged in years when winter and early spring precipitation is high. Ranchers experienced significant draw downs on surface water in dugouts and dams across South Dakota during the widespread drought of 2002 and local droughts in 2004-2006. The demonstration sites probably had higher infiltration rates and less runoff due to moderate utilization and good litter cover than surrounding pastures that have been historically season-long grazed at high stocking rates.

Appendices

APPENDIX A

Ranching Ideas Find Converts

whole.

Published: 07/26/05

WHITE RIVER - Here's the juiciest gossip to hit this ranching community lately: Dan Rasmussen put a water tank in his hay field.

That might not sound scandalous, but to experienced ranchers, it meant there soon would be cattle grazing there, and Rasmussen wouldn't have any hay in winter. Around here, such a drastic change sets the coffee shop buzzing like nothing else.

"I could have stepped out on my wife and done it in public and gotten less air time," Rasmussen said.

The gossip has since died down, and instead of falling into ruin, the Rasmussen-Lehman 33 ranch has increased its income and created a healthier grassland, flush with native species.

The changes on Rasmussen's ranch are part of a slow-moving wave of new management ideas - some as outlandish as moving the herds more than 30 times in a season or grazing them in winter instead of feeding them hay. The ideas could help ranchers survive the growing economic challenges to their way of life, but tradition and a shortage of management skill have prevented their spread.

Economics and the uncertainties of running cattle pushed thousands of South Dakota ranchers to consolidate or shut down from 1987 to 2002. Census data show the number of beef operations fell from around 19,000 to 15,000, even as the number of beef cattle grew, from 1.5 million to 1.7 million.

"The trend is that costs are going up and prices are going up at a slower rate," Rasmussen said. "So you have to figure out how to survive in that environment."

Instead of expanding, he and his partner, Blake Lehman, have turned to new methods known by a variety of names: rotational grazing, management-intensive grazing or holistic ranching. These overlapping philosophies all reject seasonal grazing, the long-practiced method of simply turning out the cows in spring and rounding them up in fall.

Perhaps half the ranchers in South Dakota practice some form of rotation - moving cows around so that each pasture gets time to rest. That allows the grasses - especially native grasses such as big bluestem, green needlegrass and western wheatgrass - to bounce back, much as it did hundreds of years ago after wild bison grazed and trampled it.

But few ranchers use the management-intensive methods Rasmussen favors, even though he says they can double production and, in many ways, bring the land back to life. The concept has been around for almost 20 years, but perhaps only one in 20 South Dakota ranchers uses it.

Fostering native grasses

Wider acceptance could have benefits off the ranch as well as on. Most importantly, a stronger native community could increase the soil's capacity to hold water, thus reducing the sediment and manure runoff that pollutes some of the state's rivers, including the Big Sioux.

Rasmussen says the core principle is allowing native grass to "express itself." That means grazing it in a pattern that allows its extensive root system to spread, which is good for both production and diversity in the long run.

In seasonal grazing, native species often were looked down upon. But that was the fault of the grazing system, said rancher Ken Kingsbury of Wood.

"Dad called big bluestem 'red grass.' They'd make the comment, 'Well, that stuff's no good,' " he said last week while visiting Rasmussen's ranch. But that was because it starts growing later than most introduced grasses, so its young, tender shoots never had a chance.

"They grazed it down to where it almost didn't exist," he said.

Now, he and many other ranchers are seeing big bluestem make a comeback because of rotational grazing. Resting a pasture in May or June lets the warm-season native recover and grow enough to be grazed again.

"There are so many different plants on a healthy prairie. Grass is not just grass," Kingsbury said.

Rasmussen said big bluestem has "exploded" on one of his pastures since he started rotating it. The grass now has almost double the protein content it used to, and his cattle get 20 percent more weight gain.

Greater efficiency

His ranch was part of a tour last week organized by the South Dakota Grassland Coalition, a group of ranchers and educators that promotes management-intensive grazing.

Rasmussen got started in management-intensive grazing about 15 years ago. At first, he worried the new fencing and water tanks would be too much work. But after putting in the first fence, he saw a change right away.

"I got the bug. I could see what we were doing, how much power we had on these pastures," Rasmussen said.

Perhaps the most important achievement has been learning to use native grasses for winter grazing. The chief winter forage is western wheatgrass, South Dakota's official state grass.

It is a cool-season native that maintains its nutritional quality in winter, which is what allowed Rasmussen to graze cattle year round and get away from the costly business of growing hay. He has not fed any hay in two years - his cows just nuzzle through the snow to find the wheatgrass.

Need for commitment

These methods are called "management-intensive" because of the fences and water supply needs, but also because of the careful planning and near-constant need to herd cattle.

"The ideal thing is you want them to take one bite out of a plant, and if you come back and take a second bite, you're putting more stress on that plant," says Jody Jessop, who ranches near Presho.

But that goal often is difficult to reach, or even approach, and that is one of the obstacles to wider adoption of the practices.

"For some people it has crashed," said Bret Olson, a range ecologist at Montana State University.

"When people are successful, the reason they are successful is because they are making a greater commitment to management."

Breaking with the past

APPENDIX B

Lifetime Managers

Lifetime Managers

Grazing management takes learning, practice and a commitment to bettering the land, a South Dakota program demonstrates.

By Stephanie Veldman
Associate Editor

Grazing management involves more than moving cattle out of a pasture once the forage has been consumed. A good manager needs to know about the plants the pasture contains, its soil quality, water resources, and optimal resting period.

Grassland managers are planners – ready for catastrophes like drought, floods and fire – with written plans and management practices in place before disasters strike.

"We've switched our management routine," says Jim Faulstich, owner and man-

ager of Daybreak Ranch near Highmore, SD. "Rather than basing our emphasis on cow numbers and pounds of calf in the fall, we've switched to grass management and preserving the vigor of our grass and taking care of the resource."

While much of the Midwest – into the western U.S. – Faulstich's place included, was hit with another year of drought, he emphasizes a good drought-management plan is necessary for survival and regrowth of pastures.

"It used to really hurt me to sell cows," Faulstich adds. "But at their current price, I know if I cut numbers down under current circumstances my resource is going to be in that much better shape for recovery."

Because of his belief in taking care of the land first, Faulstich became the first volunteer demonstration site for a program aimed at teaching all South Dakota graziers how to become better grass managers (more later).

The South Dakota Grazing Management and Planning Project (GMPP) was initiated in July 2001. It's brought together local, state and federal agencies, grassland and livestock organizations, university researchers and graziers interested in improving South Dakota's grasslands for grazing, wildlife, water quality and research purposes.

GMPP was set up in part by the South Dakota Grassland Coalition (SDGC), a non-profit group of livestock producers,

private organizations, and local, state and federal agencies working together to promote grassland management.

"The coalition's objective is to help and educate people on how to operate and manage to make your grass survive and thrive, and how you can make a living doing it," says LaVern Koch, SDGC chairman and a rancher from New Underwood, SD. "My feelings on grassland management is the closer you follow Mother Nature, the better it works."

Getting started

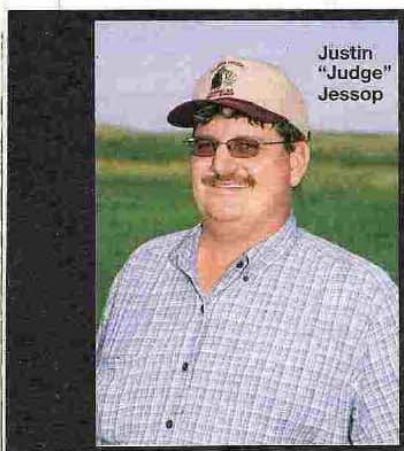
SDGC received funds from the U.S. Fish and Wildlife Service (FWS) and South Dakota Department of Game, Fish and Parks (GFP). They also applied for and received an Environmental Protection Agency Section 319 Grant Clean Water Act grant through the South Dakota Department of Environment and Natural Resources (DENR). The DENR grant provides funding to curb non-point source pollution and allowed the hiring of a project coordinator for the GMPP. In October 2001 Justin "Judge" Jessop began promoting the project and worked with a team to draw grazing plans.

Jessop, a Presheo producer, says he visits producers interested in setting up grazing plans, and begins by finding out the producer's goals for his operation.

"What changes are you willing to tolerate? What are you willing to do?" Jessop asks each producer he visits. "What do you want to change, what do you want it to look like and what can we



Jim Faulstich



Justin "Judge" Jessop

APPENDIX C

Cattle Business Weekly July 23, 2006

Grassland tour a great "see how it works" event

By CBW Staff

The Fifth Annual South Dakota Grasslands Coalition Tour was held in northeastern South Dakota July 18-19.

The tour, which is designed to provide information on grassland management and conservation, visited a variety of sites during the two-day tour.

Dan Rassmussen, Belvidere, S.D. has helped organize the past five tour. He said the goal of the tours has been to find producers doing new innovative practices and allow others to see the results of these practices.

"The best way to see if a new idea will work on your ranch is to actually see how it has worked elsewhere," said Rassmussen. "One of the most expensive things you can do is implement a practice that will fail."

The tour visited the 2,300-acre Neil Bien Ranch, which has incorporated a successful working opera-

tion with wildlife and grass management, and wetland restoration.

During day two, the tour proceeded to Lane Tekrony's grass-banking project. Working in cooperation with the Nature Conservancy, Tekrony has allowed some of his pasture to grow-up without grazing it for the season. Then with the help of Pete Bauman of the Nature Conservancy in Clear Lake a prescribed burn is conducted. The goal is to increase native grasses for future production. "This technique, with adequate moisture has definitely improved my rangeland," said Tekrony. "We've already seen the benefits."

Following the visit to the Tekrony grass-banking project, the tour traveled to The Nature Conservancy's 7-Mile Fen, a 230-acre preserve consisting of tall-grass prairie, pothole wetlands, and a fen community. The fen, located seven miles east of Clear Lake, is one of two Conservancy fen-wetland

preserves in the area.

Later in the day, the tour traveled to the Rick Smith Ranch, which is devoted to grass and livestock production. In 2005, The Society for Range Management recognized the Smith family's exceptional land stewardship by selecting them for the Area 1 "Excellence in Range Management Award." Widely recognized as a leader in pioneering innovative grazing techniques, Rick proved to be an effective and knowledgeable speaker on grass and pasture management.

The S.D. Grasslands Coalition provides technical assistance to producers on grazing rotations, range inventories and resource inventory maps. For more information contact Judge Jessop at 605-280-0127.



One of the tour stops was at Lane Tekrony's, Clear Lake, S.D., grass-banking project. Grazing restraints and prescribed burns have helped him increase his pasture productivity.



Justin "Judge" Jessop, Presto, S.D. is the project coordinator of S.D. Grasslands Management and Planning Project. Jessop works with producers statewide on management needs.



Having helped coordinate the past five grassland coalition tours, Dan Rassmussen is an avid supporter of bringing people together to see and discuss new management systems.



Jim Faulstich, runs a 350 cow/calf pair operation near Highmore, S.D. In 2000, Faulstich was among the first to enroll a portion of his operation in the Grassland Coalition's Grassland Management and Planning Project. Proving successful, his operation has been highlighted on past tours.



A highlight of the two-day tour is the ability to visit with other producers. Beneficial networking during the event is why many producers return year after year.

Using soybeans as forage

Producers facing severe drought may find an option for forage in soybeans, specialists from North and South Dakota said.

age research before starting his position with NDSU, added that moisture content of the whole soybean plant typically remains

cent oil increasing to over 6 percent oil with full pod development before there is any leaf drop. Depending on pod development, the oil



APPENDIX D

Bird Tour Brochure

Birds. At Home, On the Range. Bird Watching Tour



Meadowlark
Photo by South Dakota Tourism

June 8 - 9, 2007
Black Hills
of South Dakota

Hosted by:
South Dakota Grasslands Coalition
www.sdgrass.org

SD Grassland Coalition
24690 299th Ave
Presho, SD 57568



Birds, At Home, On the Range. June 8-9, 2007 Black Hills of South Dakota

REGISTRATION FORM

Name: _____ Organization: _____

Address: _____ City/State/Zip: _____

Phone: _____ Email: _____

Number in Party: _____ (Make copies of this form as needed. Each participant must submit a registration form.)

Special accommodations needed: ☐ YES ☐ NO If yes, please specify: _____

Please mail registration form and \$15 per person registration fee to:

Judge Jessop
24690 299th Ave. Presho, SD 57568
(605) 280-0127

Space is limited to 85
attendees.

Register now!

For planning purposes, registration form and fee must be received by May 18, 2007.



Gadwall

Two-day Itinerary

Friday, June 8, 2007

| | |
|----------|---|
| 7:00* am | Depart from Ramkota Hotel, Rapid City |
| 7:30 | Arrive at Mark Kieffer's East Ranch |
| 7:45 | Watch birds and record species |
| 8:45 | Break |
| 9:00 | Discuss bird group highlights |
| 9:15 | Habitat speaker "Birds & Cows" |
| 10:00 | Watch birds and record species |
| 11:00 | Travel to Kieffer's hills Ranch |
| 12:00 | Break and sack lunch |
| 1:00 | Presentation by Mark Keiffer |
| 1:30 | Group discussion and questions |
| 2:00 | Ranch and birding tour |
| 4:00 | Return to Kieffer's East Ranch |
| 5:00 | Slide show featuring participant's photos * |
| 5:15 | BBQ and refreshments at Kieffer Ranch |
| 6:00 | Return to Ramkota Hotel |

Saturday, June 9, 2007

| | |
|----------|---|
| 7:00* am | Depart from Ramkota Hotel, Rapid City |
| 7:00 | Travel to Ellen Reddick Ranch, St. Onge |
| 8:15 | Watch birds and record species |
| 9:00 | Break |
| 9:15 | Discuss bird group highlights |
| 9:45 | Habitat speaker "Birds & Cows" |
| 10:30 | Watch birds and record species |
| 11:30 | Presentation by Ellen Reddick |
| 12:00 | Break and lunch |
| 1:00 | Ranch and birding tour |
| 3:00 | Closing comments and discussion |
| 3:15 | Return to Ramkota Hotel |

* All times Mountain Daylight Time

* Bring your digital camera to take photos during the tour!

Birds. At Home, On the Range. Bird Watching Tour

Cost to Participate:
\$15 per person for two-day event.

To Register:
Complete the registration form and mail to
Justin "Judge" Jessop
24690 299th Ave.
Presho, SD 57568

Lodging is not included in the registration fee. However, a block of rooms has been reserved at the Best Western Ramkota Hotel for tour participants. Please ask for the "Birds-At Home on the Range Tour" block. To take advantage of the group rate, please make your reservations by May 18, 2007.

Best Western Ramkota Hotel
2111 N Lacrosse St
Rapid City, SD 57701
PH: (605) 343-8550

I-90, Exit 59 – located on the north side of the interstate, next to the Rushmore Mall.

* The tour will begin in the northwest corner of the Ramkota parking lot. Please meet at this location, per the itinerary.

Cancellation Policy:
No refunds after June 1, 2007.



Black-capped Chickadee



Mountain Bluebird

South Dakota is truly a birder's paradise. Numerous species of rare and common birds make their homes across the state, especially in the Black Hills. The rugged terrain of rolling hills and granite peaks in addition to the lush vegetation and fresh water lakes makes for exceptional habitat for birds... not to mention breath-taking backdrops for birding enthusiasts.

The South Dakota Grasslands Coalition invites you to take a journey through western South Dakota to view the abundant populations of birds that make their home there. Learn how rangeland management plays an important role in the state's agricultural industry as well as provides adequate habitat for South Dakota's native feathered friends.

This two-day tour features visits to ranches situated in the beautiful Black Hills. As a participant, you will watch and record bird species, hear presentations from land owners and learn about conservation techniques used in this area.

Space is limited to 85 participants, so register now! Pre-register by completing the attached registration form and mailing a check, for \$15 per person, to the South Dakota Grasslands Coalition.

For more information on the tour contact:
South Dakota Grasslands Coalition
Justin "Judge" Jessop
PH: (605) 280-0127
jjessop@sdconservation.org

APPENDIX E

Bird Tour Article Cattle Business Weekly 6-13-07

THE CATTLE BUSINESS WEEKLY

or Cattlemen By Cattlemen

INSIDE THIS WEEK

- Dakota Flavor at State Fair again
- Tornado wipes out Kansas town
- KGFX Farm Director passes

Wednesday, June 13, 2007

Rangelands for multi-use



Ranch tour helps showcase how birds and cows can co-exist

By Kindra Gordon

The South Dakota Grassland Coalition host-

ed a unique ranch tour June 8-9 in the Black Hills showcasing birds on the range. The tour invited bird watchers and ranchers to learn from one another about the importance of range management in providing habitat for wildlife, while also producing beef.

"Our goal is to bring birders and ranchers together and show that range management is beneficial to both," said Justin "Judge" Jessop with the South Dakota Grassland Coalition.

During the first day of the tour, participants visited Mark Kieffer's ranch west of Rapid City as well

as the Forest Service allotments his cattle graze in the Black Hills National Forest from mid-June to late October. Several species of birds were cited.

Kieffer uses a rotational grazing system and said, "We use wildlife as a barometer of how well we are managing the range."

On Saturday June 9, the group of about 40 participants traveled to St. Onge, SD to Ellen Reddick's ranch to watch more birds and learn about Reddick's grazing management practices. She also uses rotational grazing to help balance wildlife and cattle

Continued on page 9

THE CATTLE BUSINESS WEEKLY

JUNE 13, 2007

Being Bullish

Continued from page 1

needs. Reddick has planted numerous shelterbelts on her property, which are now prime bird habitat.

If you are interested in integrating the habitat needs of birds and wildlife in your livestock operation, the Rocky Mountain Bird

Observatory recommends these management strategies:

- Implementing a rotational grazing system that varies the grazing patterns and timing in pastures annually.
- Waiting to hay areas until after July 15, when most birds are finished nesting.

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

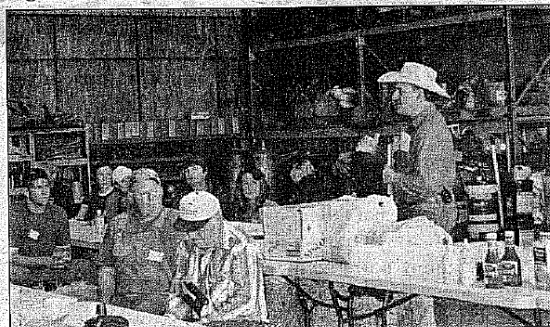
- Establishing native shrubs, legumes or forbs to add diversity to the habitat. Avoid establishing monoculture stands of forages.

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

For more about the South Dakota Grassland Coalition visit www.sdgrass.org. The coalition will host a ranch management tour July 24 at the Slovek Ranch near Philip, S.D.



Ellen Reddick, St. Onge, S.D. and Mark Kieffer, Rapid City, S.D. welcomed the Grassland Coalition to their ranches June 8-9.

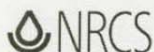


NRCS State Range Management Specialist Stan Boltz talks to tour goers about ecological sites and wildlife habitat.

APPENDIX F

Faulstich NCBA Award Nomination

United States Department of Agriculture



Natural Resources Conservation Service
Federal Building, 200 Fourth St. SW
Huron, South Dakota 57350

***Helping People
Help the Land***

Phone: (605) 352-1200
Fax: (605) 352-1270

March 9, 2006

Ms. Stacey Katseanes
National Cattleman's Beef Association
1301 Pennsylvania Ave. NW, Suite 300
Washington, D.C. 20004

Dear Ms. Katseanes:

It is with great pleasure that I submit Jim and Carol Faulstich and the Daybreak Ranch as a nominee for the 2006 National Cattlemen's Beef Association Environmental Stewardship Award.

Nearly every place I travel across South Dakota, when I mention Jim Faulstich's name, people immediately recognize his name. This attests to Jim's heart for conservation, and his willingness to stand out as a leader on conservation issues.

For over 30 years, Jim and Carol have been active in conservation issues, from local groups such as the 4-H Livestock Committee and the Hyde County Weed Board, to state and national groups such as the Natural Resources Conservation Service State Technical Committee, the Conservation Security Program Sub-committee, and the Grazing Lands Conservation Initiative. Jim has played an integral part in making the South Dakota Grassland Coalition one of the strongest and most active producer-led conservation groups in the country.

The ranching operation is a model for utilizing livestock to improve the land and remain profitable, and he has been tireless in his leadership roles in conservation. Jim also finds time to give back to his community and state in many other ways. Jim and Carol strongly support local organizations such as Jaycees, Jaycettes, and Our Saviors Lutheran Church. In addition, Jim rarely turns down an opportunity to share his experiences and knowledge with other producers at events such as Extension Beef Cow/Calf Workshops, Society for Range Management Tours, and the annual South Dakota Grazing School.

Thank you for your consideration of the enclosed nomination. If you have any questions, please contact Stan Boltz, Rangeland Management Specialist, by phone (605) 352-1236, FAX (605) 352-1261, or e-mail stanley.boltz@sd.usda.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Janet L. Oertly".

JANET L. OERTLY
State Conservationist

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

An Equal Opportunity Provider and Employer



PO Box 275
116 N Euclid
Pierre, SD 57501-0275
605-773-4531 (FAX)

Web: sdconservation.org
E-mail: sdacd.mail@sdconservation.org
1-800-729-4099
605-895-4099

PO Box 515
221 N Main St
Presho, SD 57568-0515
605-895-9424 (FAX)

March 10, 2006

Ms. Stacey Katseanes
NCBA
1301 Pennsylvania Avenue NW Suite 300
Washington, DC 20004

Dear Ms. Katseanes:

The South Dakota Association of Conservation Districts is pleased to endorse the nomination of Jim Faulstich of Highmore for the NCBA Environmental Stewardship Awards Program.

From the beginning, Mr. Faulstich involved himself and his ranch in the Management Intensive Grazing and Grasslands Management and Planning projects. Funded by a variety of local, state and federal sources, these projects seek to improve the management of private grasslands across the state by providing technical assistance, demonstrations, and research. In 1999, Faulstich's Daybreak Ranch launched the projects' first managed grazing demonstration site, an endeavor that continues today. As a director of the SD Grasslands Coalition, Mr. Faulstich represents them at most State Technical Committee and subcommittee meetings and assists the Coalition with the implementation of their EPA-319 grant within the projects.

An effective speaker, Faulstich gives presentations about his operation at the SD Grazing Schools and other rancher workshops, as well as various demonstration site tours. If asked about managed grazing practices, his response would likely be, "What are your goals and drought plans?" He emphasizes the need to individualize management practices so that they meet the needs and goals of the individual producer.

Jim is very diligent about his grass resource with drought being a real concern. In 2002 when conditions were dry, he could see the necessity of culling his herd - knowing that to sustain the resource he had to cut numbers - so he sold cows in June. He also worked with the SD Ornithological Society to survey his ranch for songbirds and native species. In September 2005, a prairie fire burned through his demonstration site. When Faulstich was asked to monitor the results of the fire recovery efforts, he readily agreed. He is moving forward and setting up enclosures to monitor the results from the fall burn. If conditions allow, he will also perform a spring burn and compare results.

Jim's concern for the grass and his willingness to "think outside the box" and to welcome new partners to the effort are strong reasons the grasslands management projects have succeeded in South Dakota. Jim is a great advocate for the environment and the cattle industry!

Sincerely,

Angela Ehlers, Executive Director

CLEAN. CLEAR. CONSERVATION.



South Dakota Section Society for Range Management

March 10, 2006

Ms. Stacey Katseanes
National Cattleman's Beef Association
1301 Pennsylvania Ave. NW, Suite 300
Washington, DC 2004

Dear Ms. Katseanes,

I am recommending Jim Faulstich and the Daybreak Ranch for your consideration for the 2006 NCBA Environmental Stewardship Award. My first encounter with Jim was when the Daybreak Ranch won the 1998 "Excellence in Grazing Management Award" sponsored by the South Dakota Section of Society for Range Management. As a result of receiving the award, Jim hosted a great informational ranch tour. The tour showcased his grazing system that is designed to improve warm season grass production along with many innovative watering and fencing ideas.

Since that time Jim took his grazing system a step further and developed a Management Intensive Grazing (MiG) system demonstration on part of his operation. Jim's system has become the model to many other systems in eastern South Dakota. As a volunteer, Jim takes time to host a yearly tour on his operation and has had hundreds of people attend.

Jim has become an irreplaceable board member and Vice-chair of the South Dakota Grassland Coalition. Through Jim's direct leadership, the South Dakota Grassland Coalition has been able to sponsor several events. The Coalition sponsored the production of a video highlighting the benefits of good grazing management and the importance of the rangeland resources in the state. Jim's perspectives have been invaluable to the Coalition as they carry out projects to improve the health of South Dakota's grassland resource. Significant projects include several bus tours that highlight progressive ranches in the state, a Dick Diven Low-Cost Cow-Calf School, a Management Intensive Grazing school, a Bud Williams Livestock Handling school, and Holistic Resource Management short courses. If this is not enough, to my knowledge, Jim has never turned down any speaking engagements where he can share his experiences in range management with other ranchers.

Jim has demonstrated a successful stewardship and sustainable operation along with his great leadership and spirit of volunteerism. I cannot think of a more deserving person to receive the 2006 Environmental Stewardship award. Thank you for your consideration of this nomination. If you have any questions, please call me at 605-892-3368 or e-mail cheryl.nielsen@sd.usda.gov.

Sincerely,

Cheryl Nielsen, President
South Dakota Section Society for Range Management



The South Dakota Grasslands Coalition wholeheartedly endorses the nomination of Jim and Carol Faulstich as nominees for the 2006 National Cattleman's Beef Association Environmental Stewardship Award. The Faulstichs have a full-time ranching operation. Their Daybreak Ranch is continually open for groups and individuals to observe the ranch's land utilization and livestock program.

Jim has always been an avid supporter of conservation and environmental issues. He is consistently willing to take the extra time and energy to make things work. Jim was one of the original group members to establish the South Dakota Grasslands Coalition as federally mandated in the Grazing Lands Conservation Initiative.

He is still very active and plays a very important part in the South Dakota Grasslands Coalition. Jim is currently serving as Vice-president of this voluntary organization. Jim Faulstich is the epitome of the old saying, "If you want something done, ask a busy man to do it."

Sincerely,

A handwritten signature in dark ink that reads "Lavern Koch". The signature is fluid and cursive, with the first name "Lavern" and last name "Koch" clearly distinguishable.

Lavern Koch
President
South Dakota Grasslands Coalition

2006 Environmental Stewardship Award Nomination

Daybreak Ranch

SECTION I:

Description of Business

Business name: Daybreak Ranch

Individuals to be recognized:

Jim and Carol Faulstich
Adam and Jacquie Roth

Address: 33795 186th St
Highmore, SD 57345

Location: Daybreak Ranch is located
twelve miles northeast of
Highmore, South Dakota.
The ranch is in Hyde County.

Nature of the Business

Daybreak Ranch is a commercial cow-calf operation that manages approximately 350 cow/calf pairs. The Faulstichs also no-till farm about 800 acres of corn, sunflowers, and oats or wheat and about 500 acres of hayland. In addition, they operate a hunting enterprise, and also custom graze yearling heifers.

The Faulstichs' Goal: *"We want to run a profitable ranch with longevity built into it in order to survive for future generations, to use and benefit from available resources while improving them at the same time."* Using cattle to convert forage into top quality beef is a tool used to accomplish this. Their goal has not changed but their approach to accomplish it has. As an example, they have shifted some of their priorities to better pasture management and put more emphasis on convenient traits and efficiency versus total pounds sold.

One of the keystones of the Daybreak Ranch is management intensive grazing. As Jim puts it, "The key is intensive management, not necessarily intensive grazing."



The Faulstichs look at their operation with a Holistic Resource Management view. It allows them to look at the whole and start to see how everything in life is interconnected. This process of decision making can make a person back up and take a closer look at present management to help keep on track to achieving goals. With the changing times and the multiple decisions made each day, they feel it's wise to be aware of new management concepts.



Jim Faulstich with one of his favorite native prairie species, Maximilian sunflower.

2006 Environmental Stewardship Award Nomination

Nature of the Business (continued)

Replacement heifers are selected from mature cows that have a proven, consistent maternal ability. Replacements are preferably picked from calves born within the first 30 days of calving. Ranch-raised heifers are kept to get uniformity, known genetics and less disease. Cows are culled when they fail to achieve the ranch's expectations.

First calf heifers are bred to Red Angus bulls to get light weight unassisted calves. The mature cows are in a cross breeding rotation program. They use Red Angus every other cross, with previous breeds used in the rotation being Gelbvieh, then Red Angus, South Devon, and back to Red Angus.



All aspects of the Faulstich's management result in a healthy, uniform and high quality herd.

Faulstichs administer a complete vaccination program in accordance with the South Dakota Beef Quality Assurance certification program. Scour shots and fly control are not a major issue due to nutrient and pasture rotation management. The Faulstichs also have a Premises Identification through the South Dakota Animal Industry Board.

Since 1973, they have shortened and moved their calving season three weeks later (beginning about March 25th) and no longer creep feed. Typically weaning occurs the first week of October with 205-day adjusted weaning weights of 600 plus pounds. Steers are backgrounded at the ranch to about 700 pounds.

History of the Business

Jim and Carol Faulstich have been actively engaged in the farming and ranching operation at the Daybreak Ranch for 34 years. Jim and Carol are graduates of South Dakota State University in Brookings, South Dakota. In 1973, Jim and Carol purchased the family operation consisting of 2,456 acres. Since then they have purchased 940 acres and rent an additional 1,231 acres for a total of 4,627 acres. They have raised three children, Jennifer, Jacquie and Jill, on the ranch. Their daughters were all very involved in the ranching operation. Jacquie and her husband Adam Roth are still involved in the Daybreak Ranch management, and also own a separate part of the operation in addition to the original ranch.

Realizing early on the need for conservation, the family has spent countless hours in monitoring and continuing education to maintain and improve their operation. Jim puts it this way, "I haven't even got to the tip of the iceberg in grass management yet."



The Daybreak Ranch "crew" (left to right, Jacquie; Adam Roth; Jennifer; Jennifer's husband James Matkins; Jill; Jim and Carol – not pictured, Jill's husband Sal Roseland; and three spoiled grandchildren).

Ecological Description of the Land

Hyde County is located in the Missouri Coteau. Coteau is defined as a hilly upland including the divide between two valleys. Generally speaking, the Coteau regions in eastern South Dakota were formed by rocks, ice and soil being pushed up on the advance of the last ice age.

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Mixed-grass prairie on the Missouri Coteau.

The Missouri Coteau is characterized by rolling to gently rolling hills with rocky soils and numerous wetlands. Associated with the hills are more gently sloping valleys that were formed by outwash when the glaciers retreated. A majority of the ranch is located in one of these valleys, referred to as the Great Ree Valley. Some of the soils in this area are rocky or gravelly, typical of glacial till, but many of the soils on the ranch are deep and fertile. Rainfall in this area averages about 16 inches per year.

Mixed-grass prairie is the dominant vegetative type on native grasslands in this area. Mixed-grass prairie is so named because it has some of the characteristics of the short-grass prairie to the west, and some of the potential of the tall-grass prairie to the east. Some of the more common native grassland species include western wheatgrass, green needlegrass, needleandthread and blue grama. Big bluestem and other tall-grass species are also present, and are making a comeback on the Daybreak Ranch.

According to the 1992 Soil Survey of Hyde County, approximately 64 percent of the acreage was in range, with 32 percent being in cropland or tame pasture and hay. A majority of the county is probably still rangeland, but there has been a recent boom in land being converted to cropland due to economic pressures. "If there is any one thing that I see as a threat to the environment right now, it's the conversion of grasslands," says Faulstich.

Income from Natural Resources

The livestock enterprise is the main source of income for Daybreak Ranch. The Faulstich's main emphasis of improvement has been improving water quality, increasing the biodiversity of the range, controlling erosion and tree plantings to develop wildlife habitat, farmstead shelterbelts and field windbreaks. They have made these improvements while sustaining profitability in their livestock, even through some of the most severe droughts on record.

The Faulstichs farm corn, sunflowers, and oats or wheat in rotation. Part of this rotation also includes alfalfa, which remains in place for a longer period of time. All farming is no-till. The Faulstichs also established over 60 acres of food plots for wildlife which are left standing over the winter to provide cover and food. They have recently diversified by including pheasant hunting as another enterprise on the ranch.



Pheasant, South Dakota's State Bird, has provided additional income to Daybreak Ranch.



Jim Faulstich leads cattle to greener pastures with the help of his portable rub and mineral tub.

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Daybreak Ranch's Environmental Partners

Jim and Carol Faulstich have worked with the following organizations to improve the environmental quality of Daybreak Ranch and the State of South Dakota.

- USDA Natural Resources Conservation Service (NRCS) – Technical assistance in designing grazing systems and related items such as water systems and fencing; technical assistance in improving wildlife habitat; cost-share for practice installation; provides input to State Technical Committee.



Jim Faulstich listens as Kelly Stout, Range Management Specialist for the Natural Resources Conservation Service, explains grass characteristics.

- Society for Range Management, South Dakota Section – Sponsored tours showcasing innovations implemented in grazing management; attend educational events.
- South Dakota Department of Environment and Natural Resources – Technical assistance to protect riparian areas and improve wildlife habitat.
- South Dakota State University, Extension – Utilize research and technical assistance; participate in South Dakota's Grazing School to share experience and knowledge.
- USDI Fish & Wildlife Service – Technical assistance through the Partners in Wildlife program to implement habitat improvement.
- USDA Cooperative State Research, Education, and Extension Service – Faulstichs obtained a grant through the Sustainable Agricultural Research and Education (SARE) grant program to do a study called the "Low Cost Precision Supplements to Add Profit to your Cow/Calf Operation" study. The goal is to determine least-cost formulation to meet livestock needs.
- South Dakota Game, Fish & Parks – Technical assistance to improve wildlife habitat.
- Ducks Unlimited – Technical assistance to provide for nesting habitat for ducks through grazing management strategies.
- Hyde County Conservation District – Technical assistance and purchase of trees in the planting of numerous shelterbelts, field windbreaks and wildlife plantings.
- Pheasants Forever – Technical assistance to provide needed habitat for pheasants.
- South Dakota Grassland Coalition – Technical assistance in the Management Intensive Grazing demonstration project; Board member.
- Environmental Protection Agency – Assistance through a 319 grant to implement improved grazing management in order to protect and improve wildlife habitat and riparian areas.
- Future Farmers of America and 4-H – Hosted range and soils judging competition, and provided natural resource education for future South Dakotans.
- The Faulstichs are members of the National Cattlemen's Beef Association and the South Dakota Stockgrowers Association. They have benefited in many ways through these organizations.

In addition to the active participation with these groups, the Faulstichs have utilized information from countless sources to improve their resource management. They have literally used an extensive bibliography to continue their learning.

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Resource Management Goals and Accomplishments

"We want to run a profitable ranch with longevity built into it in order to survive for future generations, to use and benefit from available resources while improving them at the same time."

The Faulstichs continually keep this goal in mind when making management decisions, and measure their success by the achievement of this goal.

When the Faulstichs began operating the Daybreak Ranch, the vigor and diversity of the grasslands were low. Continuous season-long grazing for a number of years had shifted the plant composition to primarily cool-season grasses, and allowed invasive species such as smooth brome grass and Kentucky bluegrass to dominate.

Recognizing the need to improve the condition of their grasslands, the Faulstichs began implementing a twice-through rotational grazing system. Even with this change, the desirable grasses did not appear to be increasing. "That's when we decided we needed to do something different. You're not going to change it overnight. Season-long grazing is what we feel destroyed the composition out there," Faulstich said.

With the use of Management Intensive Grazing principles, and also trial and error, Jim now says, "You'd have had to see the pasture [16] years ago to appreciate what it is now."

Today through all of his pastures, the result of improved management is evident. The more desirable native species originally a part of this ecosystem, such as western wheatgrass and green needlegrass, are now dominant in most areas. In addition, species indicative of climax or excellent condition such as big bluestem, purple prairie clover, Maximilian sunflower and leadplant, are evident and increasing in almost every pasture.

While keeping an eye on the grass, the Faulstichs have not lost sight of the bottom line. Profitability of the livestock enterprise has increased as the heads of big bluestem have risen over the pastures. Increasing the diversity of the pastures has also benefited the nutritional plane of the livestock by

lengthening the grazing season. Measures implemented, as Jim says to "keep every drop of rain on the ranch" also have led to increased production. Some of these measures include:

- Use hoof impact to activate sod-bound areas during the dormant or early growing season by alternating the feeding area.
- Dormant-season grazing of native grasses and crop aftermath for winter grazing narrows the window for feeding, saving time and money.
- Rotation of the calving pasture reduces herd health problems by eliminating disease cycles.
- Development of multiple water sources to improve distribution.
- Establishment of native warm-season grass seedings on marginal farm land to complement existing grass forage resources.
- Erosion prevention such as rock crossings on creeks, and no-till rotational farming.
- Management of wetlands for wildlife, which also provide additional forage during extremely dry periods.

The most telling evidence that the Daybreak Ranch is on the right track is the condition of their grasslands after persistent drought conditions in recent years. Faulstichs had a Drought Management Plan in place which included: detailed records of cattle performance in order to make culling decisions early; early weaning calves at 60 days of age; flexibility of custom grazing of yearling heifers when forage is available; storing hay from productive years in sheds; keep debt low; diversify enterprises (pheasant hunting); and monitoring forage and precipitation data continuously with defined trigger points so as to make decisions in a timely manner.

In the peak of this drought, the Faulstichs still had excellent grass cover, and were still grazing a substantial portion of their cattle when some people were feeding or had sold or moved their cattle to greener pastures. Some people said that it looked as though the Faulstichs had somehow irrigated their grasslands.

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Innovative Stewardship Practices on the Daybreak Ranch

The saying, “Necessity is the mother of invention” is embodied throughout the Daybreak Ranch operation. While many of the Faulstich’s management decisions have come about through assistance provided by the partners mentioned above, as Jim says, his system of rotational grazing was developed largely through “a lot of trial and error.”

Energy

At the Daybreak Ranch, energy efficiency means a way to reduce costs, and benefit the environment. Some practices that conserve energy include:

- Use of blended fuels, such as soy derived biodiesel, and ethanol.
- Houses utilize geothermal heat pumps.
- No-till farming reduces trips on the field while conserving carbon in the soil.
- An artesian well supplying most of livestock needs eliminates energy used for pumping and heating water.
- Improved livestock grazing management increases productivity and diversity of grasslands which reduces energy used to put up hay. Dormant-season grazing of grass and crop aftermath also reduces use of feed.



Adam Roth, Jim’s son-in-law, leads cattle to the next pasture with the portable cattle rub/mineral tub. Animal handling techniques (lead cows, don’t chase them) also reduce energy costs.

- All fertilizer is applied according to annual soil tests, and fertilizer is applied sub-surface thereby reducing amount of fertilizer used.
- Fecal sampling and mineral testing is utilized to match livestock requirements and prevent overfeeding of protein and phosphorus.
- Where feasible, Faulstichs use portable electric fencing powered by solar energy.
- Weaning on grass is a strategy used to reduce feed and supplement usage, as well as reducing stress and sickness.
- Many of the cattle facilities, such as water, fencing, mineral tubs and rubs, are portable with the use of more fuel efficient four-wheelers.
- Grazing system is maintained with use of four wheelers rather than pickups, saving substantially on fuel usage.



Faulstichs enjoy the small wildlife, too, such as this summer azure butterfly.

Wildlife

For the Faulstichs, an abundance of wildlife is more than a means to supplement their income or simply increase their enjoyment by seeing an increase in species diversity. Wildlife is also an important part of their natural resource monitoring which helps Jim decide if he is achieving his ultimate goals. Some practices and activities that the Faulstichs employ to improve conditions for wildlife include:

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- Improve nesting opportunities for wildlife by adjusting timing of grazing and leaving some areas for only winter grazing.
- Over 60 acres of food plots have been established for wildlife food and cover, and are left standing over winter.
- Cutting of hayland and road ditches is timed to avoid prime nesting periods. Flushing bar is used on harvest equipment to move birds out of the way during harvest.
- Work with EPA and NRCS to develop grazing management strategies that protect and enhance wildlife habitat and riparian areas.
- Grazing lands are managed in such a way as to provide cover, water and shelter needs for wildlife.

The Faulstichs enjoy seeing wildlife thrive on the land they manage. Some of the species Jim has noted include sharp-tailed grouse, prairie chickens, pheasant, Hungarian partridge, many species of raptors including bald eagle and burrowing owl, many species of song birds, including those that require native prairie to exist, white-tailed deer, mule deer, antelope, fox, coyote, badgers, and many other species too numerous to mention.

Manure Handling

Rotational grazing strategies are used throughout the year on the Daybreak Ranch. Livestock are rarely ever in any type of confinement. The Faulstichs have implemented a Nutrient Management Plan which emphasizes keeping the cattle on the land, so that manure handling is not an issue. Even calving and wintering areas are rotated so as to eliminate the need to handle manure.

To protect individual newborn calves in bad weather, Jim uses small portable plastic huts. An idea of Jim's, he has received a patent on this invention. They are light enough to be loaded in the back of a pickup, and can be placed over a newborn calf, allowing the calf time to warm up and not disturb it from the natural calving area.

Steers are backgrounded at the ranch to approximately 700 pounds and then typically sold.

Water

Many of Daybreak Ranch's management decisions are guided by Jim's principle of "keeping every drop of rain on the ranch." From the soil moisture conserving practice of no-till farming to increasing infiltration by increasing species diversity on grassland, Faulstichs believe that moisture management will keep their operation sustainable into the future.



Upstream view of water above dam constructed by Faulstichs. Cattle are managed to minimize impacts to vegetation and provide habitat for wildlife.

Innovative practices related to the conservation of water resources include:

- Use of portable, above-ground pipe and portable tanks to supply water to livestock. Paddock size and placement can be adjusted for current conditions, and water is supplied when and where needed with little waste.
- Assisted with implementation of the Wolf Creek Water Quality Project, where water quality was improved through proper grazing use and improved grazing system management.
- Improved water distribution by developing a free-flowing artesian well. Water is piped to rubber tire tanks which provide fresh water at all times for livestock and wildlife.

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- Developed dugouts and dams as water sources for livestock and wildlife, increasing water storage capacity and providing wildlife habitat.
- Restored a major creek dividing the ranch that once created erosion problems and hindered ability to utilize pastures evenly. Faulstichs restored a dam and installed a rock crossing which improved livestock distribution and allowed the riparian area time to recover.
- Manage two large wetlands encompassing 246 acres for wildlife enhancement.
- Focused grazing management on shifting species composition to a higher diversity which results in a significant reduction in runoff and an increase in infiltration. Water kept on the grasslands prevents erosion from concentrated runoff, and increases plant production by conserving soil moisture.

Air

Air quality in central South Dakota is affected most by wind-born soil particles due to soil erosion by wind. This is a chronic problem especially where conventional tillage takes place and partly due to South Dakota's more typical landscape which is a tree-less prairie.

Faulstichs have implemented a number of practices on the Daybreak Ranch to improve air quality. Soil erosion from wind is greatly reduced or eliminated by no-till farming. Grass is managed in such a way as to always have abundant cover, which also reduces soil erosion by wind. Faulstichs have also put gravel on many of the ranch roads to cut down on erosion and dust.

The Faulstichs have also planted thousands of trees in farmstead shelterbelts and field windbreaks, as well as to provide for wildlife habitat. As a result, the Faulstichs were recipients of the 2005 Hyde County Tree Care Award.

Through rotational management of grazing throughout the year and keeping cattle on the land instead of in confinement, the Faulstichs have basically eliminated problems associated with dust control inherent in some confinement operations.

Plants and Animals

One of the cornerstones of the Daybreak Ranch is the focus on diversity, not only in wildlife, but especially in plants. Jim Faulstich has become something of a plant identification expert in the ranching community, because he believes firmly that diversity results in sustainability.

Many of the innovative practices implemented on the Daybreak Ranch have the ultimate goal of improving plant diversity:

- Grazing management is based on the concept of planned recovery. Faulstichs understand that maintaining and improving the health and vigor of grassland species is accomplished when individual plants have adequate time to recover. Leaf area remaining after grazing is essential in order for recovery to take place.
- Boundary fences are barbed wire and permanent electric. Nearly all interior fences are electric with single strand poly wire being used to subdivide pastures further which provides for ultimate flexibility in meeting plant and animal needs.
- Jim Faulstich manufactured a power-take-off driven electric fence roller. He estimates ½ mile of poly wire electric fence can be placed or removed in ½ hour. This allows him the flexibility of moving his fence to best serve his grazing needs in a timely manner.
- Forage sampling in conjunction with wet chemistry forage tests are used to evaluate the ruminant nutritional needs. The data is used to make adjustments in grazing systems to better meet the needs of the livestock and the grass.
- Utilize CHAPS (Cow Herd Appraisal Performance Software) cattle production record keeping system to track performance of individual animals and herd.
- Bulls selected by: DNA tests for tenderness and marbling, ultra-sounded for carcass traits, and visually inspected for size, correctness, muscling and disposition.

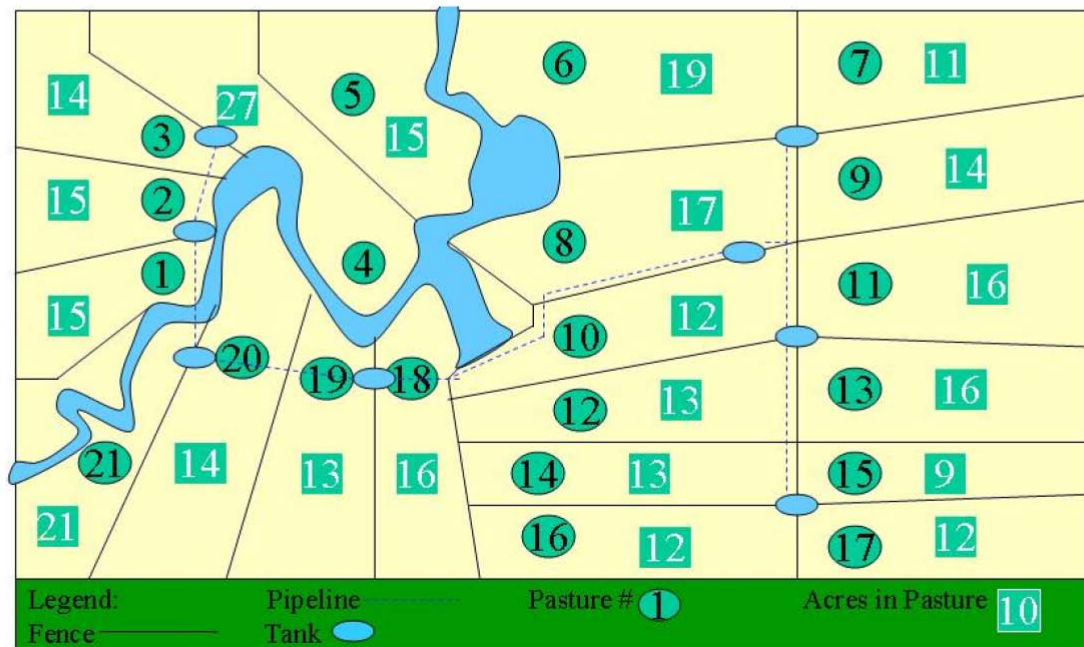
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Standing in big bluestem, another favorite species, Jim inspects the end of a single strand poly wire fence attached to a barbed wire fence.

- Sire summary data used to select blood lines that meet their requirements. EPD's (Expected Progeny Differences) and birth and weaning weights are given top priority.
- Implement a monitoring plan to continually measure success towards reaching goals.

For six years, the Faulstichs have participated in a Management Intensive Grazing (MIG) demonstration project sponsored by the South Dakota Grassland Coalition. When first approached with this idea, Jim admits that he was a little skeptical, "Twelve years ago I would have looked at something like this and laughed. I'm now a grazing system advocate... our state needs more of them." In addition to the benefits derived from implementing this system, including increased plant diversity and a lengthened grazing season, Jim also uses this system to educate other ranchers from around the state. This is achieved through tours, a web site which catalogs all accomplishments and research that has been conducted on the project site.



Map showing MIG Demonstration Project design. Pasture size and placement are flexible due to portable fences and water systems.

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SECTION II:

Leadership Activities on the Daybreak Ranch

Jim and Carol Faulstich lead through example. First, they lead through a demonstration of community involvement. Both Jim and Carol have been leaders in the local 4-H Club. Jim served as Chairman of the 4-H Livestock Committee while Carol has been part of the Leaders Organization and also a Club Leader. Jim and Carol are very active in the local church.

In addition, Jim helped organize the Hyde & Hand County Bootstraps Group, a locally-led ranchers group that provides education and assistance to ranchers. The Daybreak Ranch was also the recipient of the 2005 Hyde County Tree Care Award. Jim has also served on the Hyde County Weed Board and the Hyde County School Board.

Secondly, Jim Faulstich is involved in leadership activities on a state-wide basis and beyond. In 2000, Jim spoke at hearings related to sediment control on the Missouri River. Jim is actively involved in South Dakota's Grazing Land Conservation Initiative group, called the South Dakota Grassland Coalition (currently Vice President). The Grassland Coalition, with the help of Jim Faulstich, has been effective in influencing legislation and agency policies. Jim has also been involved in regional livestock breed associations.

Jim has been an active member of the USDA NRCS State Technical Committee for several years. He unwaveringly represents the producer's point of view at these Committee meetings. He also serves on several sub-committees related to the State Technical Committee (Conservation Security Program, Environmental Quality Incentive Program, Grassland Reserve Program, and the Wildlife Habitat Incentive Program).

Another way Jim has been actively involved in promoting the livestock industry is through the media. Jim has given numerous interviews to newspaper, magazine, radio and TV outlets. He effectively speaks for producers.

Involvement in Research, Education, and Demonstrations

The Faulstichs have used the Daybreak Ranch and their experiences gained in its operation in numerous ways:

- Host numerous tours at the ranch where hundreds of people have learned first hand the benefits of good resource management.
- Jim Faulstich speaks at numerous workshops around the state (Drought Management Seminar, South Dakota Grazing School, various Rancher Workshops, Extension Beef Cow Workshop).
- Hosted a graduate student from China, but attending Princeton University to conduct research on the Bend-Edwin soils complex.



Jim Faulstich gives presentation at the South Dakota Grazing School. Jim has given presentations at this event for several years.

- Participates in the South Dakota Grassland Coalition's Management Intensive Grazing Demonstration Project.
- Faulstichs open their land and assist local FFA Chapters and 4-H Clubs with soils and range judging practices and competition.
- Obtained a SARE grant to conduct a study on low cost precision supplements to add profit to cow-calf operations. Faulstichs' goal is to reduce supplement cost by \$10-\$40 per head while increasing livestock performance, and they will share results of this study.

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Involvement in Government Programs

The Daybreak Ranch has worked hand-in-hand with all of the partners mentioned before and Jim is appreciative of the technical assistance and cost-share assistance he has received. "I've had an awful lot of help from them," Faulstich said. "People need to know there is a source out there where they can get information."

Some of the programs the Faulstichs have utilized over the years include:

- Great Plains Conservation Program (GPCP).
- Agricultural Conservation Program (ACP).
- Long Term Agreement (LTA).
- Environmental Quality Incentives Program (EQIP).
- Wildlife Habitat Incentive Program (WHIP).
- Conservation Technical Assistance (CTA).
- Environmental Protection Agency 319 Grant.
- Partners in Wildlife assistance.
- Various Extension related assistance including CHAPS record keeping computer software.

How the Faulstichs will persuade other producers to implement conservation programs

Jim Faulstich will continue to persuade producers and others about the benefit of good conservation through many of the activities he currently is involved with. First and foremost, Faulstichs will continue to demonstrate how sensible conservation will help them achieve their goal of "a profitable ranch with longevity built into it."

Jim Faulstich will continue to use his many outreach activities to persuade producers to implement conservation programs, such as the South Dakota Grassland Coalition, producer workshops, and other speaking engagements and publicity.

Jim advises those considering conservation measures such as management intensive grazing, "Don't try doing this on an entire operation in year one."

"Pick out one pasture nearby and start there. Don't try doing the whole thing or you'll get awfully frustrated," Jim says. "Don't do it all at once. You'll just be chasing your tail. Start small and work into it."

Jim encourages people to go to field days and tours and look at operations that are already implementing rotational grazing practices. "I find that to be helpful. I think you need to see some of these things happening in another operation to see that it is possible," Jim says.



Jim talks to producers on a tour of his management intensive grazing system.

How the Daybreak Ranch contributes to a positive public perception of cattle impact on the environment

All one must do to see how the Daybreak Ranch will contribute to a positive public perception of cattle impact on the environment is to spend a little time with Jim Faulstich. In short order, you will soon see Jim's passion on this issue. Jim once said, "We've got a hilltop completely covered with purple clover. With management, you can get those things to come back. We have species... that I never thought we'd see."

Jim speaks about his passion far and wide. He takes opportunities to get the message to the public in general through radio, TV, newspaper and magazine interviews. He has never turned down an opportunity to talk with other producers about conservation being implemented at the Daybreak Ranch.

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SECTION III:

Stewardship on the Ground

Wherever Jim Faulstich goes, he takes his message of how he and his family took what most would have considered “good” land and made it great. The Daybreak Ranch now thrives with wildlife, has healthy and continually improving grasslands, and the business is sustainable and profitable. Jim believes that stewardship of the resources leads to better health of everything, from the wildlife and livestock to the land, water and ultimately the humans affected.

Jim keeps several principles in mind as he makes decisions in his day-to-day management:

- Manage and operate in harmony with nature. Keep the natural cycles (i.e., plant growth curves, natural breeding cycles, normal water and nutrient cycles, etc.) in mind when making management decisions.
- Manage for the grass (grass is the crop, not the livestock) and for what Jim calls efficient and convenient cattle traits that complement his forage resource.
- Minimize costs and keep debt low. One way Jim has done this is by making winter grazing a priority. Through dormant season grazing and grazing crop aftermath, Jim is striving for year-round grazing on the operation. He also keeps machinery at a minimum.



By grazing cattle on dormant season grass and crop aftermath, the Faulstichs reduce feeding costs and disease problems.

- Managing the water cycle is paramount to good resource management. Keep every drop of rain, and don't let water leave the ranch.
- Utilize techniques to minimize stress on livestock. Improved handling techniques, such as working with cattle to the point where they can be led instead of driven, and moving cows that haven't calved away from pairs at calving time to keep them on clean ground.
- Efficient, easy-keeping cattle with good disposition cause less problems and are more profitable.
- Utilize a Holistic Resource Management view when planning. All aspects of the operation affect each other, so it helps to look at the whole or the “big picture” and try to consider how individual decisions impact other parts.
- Continually learn. Jim and his family read, attend educational programs and talk to other operators and partners to try and stay proactive instead of reactive. As Jim often tells Adam, “If we don't learn something every day, then we've had a failure.”
- Any capital investment needs to have more than one significant benefit before it will be seriously considered.
- Set goals and manage for them. Jim's principle is, “Utilize what you have – manage for what you want.”

“It's really enjoyable to not live in fear of running out of forage, which was the case a number of years ago. With proper management of the resources and a drought plan, that should never happen again. And that results in a very good relationship with our banker who is extremely supportive,” Jim explains.

Jim says, “Our operation has more than tripled in size since we started, with about the same amount of debt we had in the 1970's. Now Jacquie and Adam own a significant amount of the ranch, and that fits into our overall goal of passing the ranch to the next generation.”

APPENDIX G

Greener Pastures Booklet

GREENER PASTURES



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Dear South Dakotans,

Welcome to this valuable grassland management resource informational guidebook. With the goal of improving our grass resources in South Dakota (SD), the groups and individuals contributing to this book work hard each day to make improvements. We hope that more South Dakotans follow our footsteps and utilize the important ideas and resources that are outlined in this helpful guidebook.

Even though you may already have immeasurable experience in SD grassland management, we know that you will find this resource guidebook helpful, and we hope that you learn something new as you read its content. The knowledge that you will have gained will assist and empower you to implement your own grazing management system.

As you absorb and understand the information in this guidebook, we hope that you will consider the positive effect that you can have on our grassland resources. The grasslands need your energy, expertise, and commitment in preserving the environment and ensuring a successful SD agriculture industry for years to come.

SDGLC Board of Directors

“A UNIFIED VOICE FOR MANAGING SOUTH DAKOTA’S GRASS RESOURCE”

The South Dakota Grassland Coalition (SDGLC) is a non-profit organization that seeks the voluntary improvement of privately owned grasslands for the long-term needs of the resource and its various species. While providing the appropriate tools and training for grassland managers, the SDGLC's goal is to provide local leadership and guidance in a cooperative effort.

Provided with the correct assistance, grassland managers will be better prepared to make cost-effective and environmentally sound management decisions.



SD GRASS MANAGEMENT RESOURCES



First and foremost, the SDGLC provides education. Among others, grassland management requires knowledge of grass species, how much grass should be grazed, and the importance of riparian areas. SDGLC has a wealth of informational tools available and is willingly prepared to share it with others seeking assistance.

Along with the Natural Resources Conservation Service (NRCS), South Dakota State University (SDSU) extension program, and private consultants, the SDGLC offers assistance and information to individuals and groups who are interested in grazing management and are committed to improving South Dakota's grasslands. These supportive agencies also offer technical assistance and guidance.



When starting a grazing management system, there are a considerable amount of choices to consider: where to divide pastures, where to place water tanks and mineral blocks, and what type of grass species to use. The SDGLC and other resource management supports provide one-on-one assistance to the manager until a level of comfort is achieved with the new grazing system being implemented.

The SDGLC, in partnership with ranchers across the state, has established various demonstration sites. Current and prospective grazing system managers are invited to visit these sites to provide them valuable hands-on learning experiences, allowing them the opportunities to witness a system in operation and to ask questions directly to the owner regarding how their specific management system works.

Perhaps as importantly, SDGLC and associated resource management agencies can provide landowners an opportunity to acquire the skills needed to improve the profitability of their operations. Sharing knowledge of grazing management and informing landowners about how to increase grass harvest efficiency can provide a valuable service to both the landowner and the economy.



WHY GRASSLAND MANAGEMENT?



"I am confident my ranching decisions are in the best interests of everyone and everything... for the long term."

– Jim Faulstich, Rancher
Highmore, SD



Traditional methods for grazing livestock have been in place for generations. As "tried and true" methods continue to work, new technologies and resources have become available that help maximize the health of the resources while maintaining the overall productivity.

Grassland management involves more than simply moving livestock from one pasture to the next. Successful grassland managers are educated in grassland health, understanding among the following:

- soil quality
- quantity and quality of water
- harvesting
- animal nutrition
- modern technologies
- fencing
- water development
- resting and how plants grow
- monitoring techniques

KNOWLEDGE IS POWER

"At first, we had a production approach to ranching," says Jim Faulstich, who ranches near Highmore, SD. "Now, we have shifted to a grassland management style that allows flexibility and considers all the resources – soil, water, air, plants, animals and people. Sure, the gross margin isn't always as high, but in the long run, the overall resources of the ranch and my business are more healthy and profitable."

Faulstich, a member of the SDGLC, has put his ranch where his words are. Using tools from many sources, including U.S. Department of Agriculture conservation programs, Faulstich has become a successful model of a grassland manager.

"I wish someone would have told me 30 years ago what I know now. I am the same person I was before...my stewardship ethics have not changed. What has changed... is my knowledge. With what I have learned and experienced through participating in project demonstrations, workshops, classes, site tours and more, I am confident my ranching decisions are in the best interests of everyone and everything...for the long term."

Faulstich concludes: "It's enjoyable not to live in fear of running out of forage which was the case a few years ago. With proper management of the resources, and having a drought plan, that fear shouldn't happen. This management style results in a good relationship with our banker who gives us unbelievable support."

GENERAL PRINCIPLES

Grazing systems involve a number of variables including the following: carrying capacity of the land, type and distribution of the livestock, and number of pastures. A combination of both proper grazing techniques and grassland management will improve harvest efficiency and lower production costs.

To develop a sound grazing management program, keep in mind these general principles:

1. **Meet the nutritional needs of your livestock.** Livestock performance will differ depending on the quality of the plants being consumed. A healthy plant community will better meet the nutritional needs of the livestock. Allow enough grazing area for your herd, basing the pasture size on plant production capabilities. In addition to forage quality, each pasture must produce an adequate quantity of forage required by the grazing livestock.
2. **Optimize forage yield, quality, and persistence.** Plants need leaf surface area to capture the energy from the sunshine. By rotating livestock at the appropriate times, grasses are given the rest period needed to grow, to build root reserves, and to continue to thrive.
3. **Protect and enhance the resource base.** Proper livestock rotation protects and promotes plant growth and vigor. Plants that are given sufficient rest periods become healthier over time and provide more nutrients to your livestock. Additionally, more desirable plants can thrive to provide more diversity.
4. **Integrate knowledge and technology to develop a practical and economically viable management system.** Knowledge and technology equate to power. This power can provide a successful grazing system that operates efficiently, which means a healthier grassland, healthier cattle, and increased profit.



CHOOSING GRASS SPECIES



IDENTIFYING WHAT YOU HAVE – SELECTING ALTERNATIVES

In order to make management decisions supporting your overall objectives, identify what resources are currently available to help you reach those objectives and what problems may need to be addressed. Completing a resource inventory that includes the species present and available forage production will aid in selecting alternatives, subsequently helping to achieve your goals.

Identifying plant species and knowing the palatability for the livestock you intend to graze are essential in making grazing management decisions. For example, the best way to extend your grazing season is to provide for both cool season and warm season forages. If the inventory indicates that some of both occur, but insufficient in quantity, a management system may be designed to enhance the element that is most needed to meet your goals.



Called a feed and forage balance sheet, measuring your current production and comparing it to the requirements of the animals should also be evaluated. Improved management can increase harvest efficiency resulting in more forage consumed by the grazing animals. However, if production is significantly lacking to meet your goals, other actions, such as augmentation of grasslands and/or other lands with adapted desirable species, may need to be implemented in addition to management changes.

After the resource inventory is completed and once your goals are stated, select the species that is adapted to the area's climate and soils if seeding is needed. Based on your goals and objectives, select the proper species that matches your management needs and consider factors that may affect production: damaging insects, chance of fire and/or hail, and the need to provide habitat, cover and food for wildlife. Consider building diversity into your resources by including native plants and selecting varying lifecycles. Diversity allows for natural protection against disease and pests, provides for needs of other beneficial insect and wildlife species, and tends to extend the length of the grazing season.

Making some of these decisions can be difficult. Again, supportive individuals at SDGLC, NRCS, and SDSU are available to assist in this process. You can contact the individuals listed in the back of this book for assistance, or you can find more information and contact information at www.sdgrass.org.



WATER QUALITY

While it has long been acknowledged that access to water makes the difference between a profitable or unsuccessful operation, producers are just beginning to understand that water quality may be as important as water quantity. Studies have found the following:

- Cattle with access to clean water spend more time grazing and less time resting than do stock that drink from a pond.
- Calves gain up to a quarter pound more a day when the cow has access to clean water.
- Cattle with access to clean water in tanks gain as much as a half pound more per day than do stock that drink lower quality water from dugouts or ponds.



Because it can affect production, it is important to consider water quality as well as quantity when planning a grazing system. To provide the herd with access to clean water, consider pumping water from streams, lakes and ponds into tanks, and using pipelines to make water available at several places in the pasture.

Providing an adequate supply of clean water has additional benefits. Studies have shown that cattle do 77 percent of their grazing within 1,200 feet of their water source. Providing several sources of water scattered throughout the pasture promotes more uniform grazing and distribution of manure, causing the following to occur:

- Improves forage production.
- Increases the plant and wildlife diversity.
- Decreases the amount of sediment, nutrients, and bacteria that wash into dams, dugouts, and streams.
- Proper grazing and residual height of the grass is important for future production, water infiltration, and grass health.



The information above gives additional consideration to the importance of water quality and quantity within the grazing operation. In any community, water will cycle. It is important that grass managers understand how the water cycle will enhance the goals established. A healthy grazing operation will effectively use water coming into the plant community for plant growth, holding excess moisture in the soil for future plant use. Mulch and litter will prevent soil erosion and resulting loss of nutrients carried off by runoff waters. The benefits do not stop at the fence line. Nutrients and sediment are reduced in the lakes and streams farther down the watershed as well. Therefore, it is important to maintain a healthy, productive plant community that uses more water for plant production on site rather than allowing runoff that can carry valuable nutrients and topsoil down stream.



PLACEMENT OF WATER AND SALT/MINERAL BLOCKS



Proper placement of water and salt/mineral blocks can aid in uniform distribution of livestock within a pasture. With proper placement of these necessities, you can control animal distribution patterns that will result in reduced trampling and cause a higher harvest efficiency.

Depending on the topography of your land, place salt and mineral blocks away from riparian areas to further distribute grazing and reduce stream bank erosion and pollution around natural water sources.



GRAZING RIPARIAN AREAS

In the event that your land includes a stream, river, lake or pond, you should take special care of the riparian area that surrounds the body of water. A riparian area is the space immediately adjacent to the shore where water and land interact. These areas usually include abundant plant life, including shrubs and trees.

The health of riparian areas is crucial to the ecosystem and relies heavily on proper management. The care you place on your upland area should be integrated into the riparian area as well. The best way to do this is to control the amount of time cattle spend in the riparian area. After a determined amount of time, encourage livestock to move away from these areas to give the area adequate rest.

Stable riparian areas are beneficial for the following reasons:

- protecting productive land from erosion
- reducing sedimentation in the water
- reducing damage from high water flows
- retaining more water



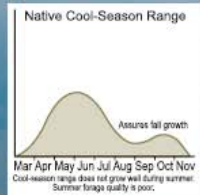
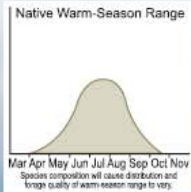
NATIVE GRASSES

Native grassland species – grasses, forbs, legumes, and some shrubs – are a vital part of South Dakota's livestock industry. Native species tend to be well adapted to the soils and climate of the specific area in which they grow. They are typically less susceptible to disease, pests, drought and other ailments that can sometimes affect introduced, or tame, planted species. A good mix of a variety of native species can not only provide nutritious forage for livestock, but can also greatly benefit other natural resources such as wildlife, soil health and the water cycle.

Native grassland species are often grouped according to their response to various disturbances: grazing pressure, wildfires, and prolonged drought. Decreaser species tend to decrease in abundance with increased disturbance. Increaser species will initially increase in abundance but will later decrease with increased disturbance. Invader species are those that are not typically found on a specific site and will continually increase in abundance if disturbances continue for long periods of time. Good grazing management is essential in order to keep the wide variety of species healthy and productive on native grasslands.



WARM AND COOL SEASON GRASSES



Grasses are often divided into two groups based on their season of growth. Cool season grasses grow in the early part of the growing season (spring and early summer) while warm season grasses grow later in the season (early summer to late summer). Due to their differences in maturity rates and forage production, the right mix of warm and cool season grasses is essential to a successful grazing management system. In much of SD, the native grasslands will have a mix of cool and warm season species when they are well managed. Examples of warm season grasses found in SD include the following: big bluestem, switch grass, little bluestem, side oats grama, and blue grama.

Some examples of cool season grasses found in SD include western wheatgrass (SD's state grass), green needle grass, and needle-and-thread – all native to the land. More aggressive, introduced species include smooth brome grass, bluegrass and crested wheatgrass. These grasses recover quite well and tend to be most productive in the spring and fall.

Depending on where you are in the state, your land may be dominated by either cool season or warm season grasses. Oftentimes, improved grazing management (i.e., rotational grazing, changing season of use, etc.) can lead to an increase in the missing component. Sometimes, achieving a mix of warm and cool season species may require seeding pastures, or portions of pastures, to the group that is not abundant.

| GRASS SPECIES | APRIL | MAY | JUNE | JULY | AUG. | SEPT. | OCT. |
|-------------------------|-------|-----|------|------|------|-------|------|
| Smooth Brome | | | | | | | |
| Tall Fescue | | | | | | | |
| Intermediate Wheatgrass | | | | | | | |
| Orchardgrass | | | | | | | |
| Switchgrass | | | | | | | |
| Big Bluestem | | | | | | | |
| Indiangrass | | | | | | | |

INTRODUCED GRASSES

Introduced grasses are plant species that have been "introduced" from another country where they grew as native plants. Because they have been introduced into an environment where they do not naturally grow, most introduced grasses require a higher level of management and fertilizer inputs in order to sustain higher levels of productivity. Like other high producing forage crops, establishment and maintenance costs must be considered in relation to the increased production they may provide.

For that reason, and because of their usefulness as a forage supply on lands suitable for cultivation, introduced grasses can be beneficial to the grazing management system.



WILDLIFE



Proper grassland management has many benefits for the land, the manager and the livestock. Doing so equates to a good wildlife habitat.

For example, there are many species that rely on grasslands not only for forage, but also for cover and protection. Prairie chickens, burrowing owls, and antelope are a few animals whose habitat is primarily a grassland community. These grasses provide cover from predators and, therefore, aid in maintaining their populations.

Rested areas of grass are also useful to wildlife. These areas provide valuable nesting cover for many grassland birds including game birds such as pheasant, duck and grouse. Increased numbers of grassland songbirds can be found on properly managed grazing lands.



GRAZING SYSTEMS

According to rangeland and pasture specialists, there are three basic methods of grazing:

1. **Continuous Grazing:** A one-pasture system that allows livestock to continually graze within one large section of land. Though requiring the least amount of management and keeping capital costs to a minimum, this system is also the least efficient in terms of resource use and profitability. Some disadvantages include the following:
 - lower forage quality
 - uneven pasture use
 - greater forage loss due to trampling
2. **Rotational Grazing:** A rotational system uses more than one pasture and rotates cattle from one pasture to the next at varying intervals. This allows the pasture to rest, re-grow forage, provide a longer grazing season, and reduce the need for feeding harvested forage. However, costs for fencing and water may be at a higher level.
3. **Management-Intensive Grazing:** Though this system requires the greatest investment both financially and physically, the advantages are worth the extra effort and features the following:
 - the highest harvest efficiency per acre
 - a potential for higher stocking rates
 - more uniform grazing and manure distribution
 - improved water cycle and biodiversity
 - more days of rest for plant growth

Continuous Grazing



Rotational Grazing



Management-Intensive Grazing



DESIGNING A PROGRAM



The development of a successful grazing management program begins with performing the following tasks and asking yourself the following questions:

- Taking a “mental inventory” or account of your current grazing management system
- Making an observation of what is happening that you would like to change
- Considering what you are willing to do to make any of the necessary needed changes
- Deciding on how much time you are willing to devote to operating a new system



The SD grass management resource agencies mentioned previously can help you determine a direction and design a system that is in line with your goals. While helping suggest ideas, alternative practices and management strategies, specialists can assist with an inventory of your existing grass resources by listing the plant communities and their current productive capabilities. An inventory of your existing resources will help utilize what you already have and offer ideas on how to implement additional practices to better manage your grassland resources.

In developing a grazing management program that works for you, a drought plan should be essential to provide guidance during times lacking forage. SD grass management resource agencies can assist with developing an effective drought plan that will provide you steps to take as precipitation declines. This emergency prevention plan will provide “trigger” events and procedures for you to implement on a timely basis, stating on certain dates, chosen by you, if and when moisture has not been received. At that point you can start destocking animals to protect the resource, find additional pasture, or purchase supplemental feed. A drought plan allows you to take advantage of higher cattle markets, lower feed costs, and lower mental stress.



On any acreage there are several ways to set up a grazing management system. Working with you, the SD grass management resource agencies will start by drawing up options for pasture division and cattle distribution. Together, you will consider the absolute number of acres needed to sustain your herd for a certain amount of time.

For the next step in developing a grazing schedule, there are multiple factors to consider. Choosing a mix of grass species, knowing when to graze, and assessing how much of the plant should be grazed are key influencers in creating this schedule.

WHEN TO GRAZE/HOW MUCH TO GRAZE

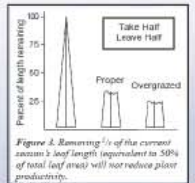
While every grazing management system is unique, there are a few similarities between systems in determining when to graze. Consider each of the following factors to avoid overgrazing:

1. Design the system according to your management goals.
2. Plan for unplanned events such as drought, increased insect populations or wildfire.
3. Plan the season of use according to plant lifecycles and animal needs.
4. Remember that spring moisture leaves plants more vulnerable and susceptible to trampling.
5. Do not graze the same pasture the same season two years in a row.
6. Take half and leave half of the weight of the current year's growth.

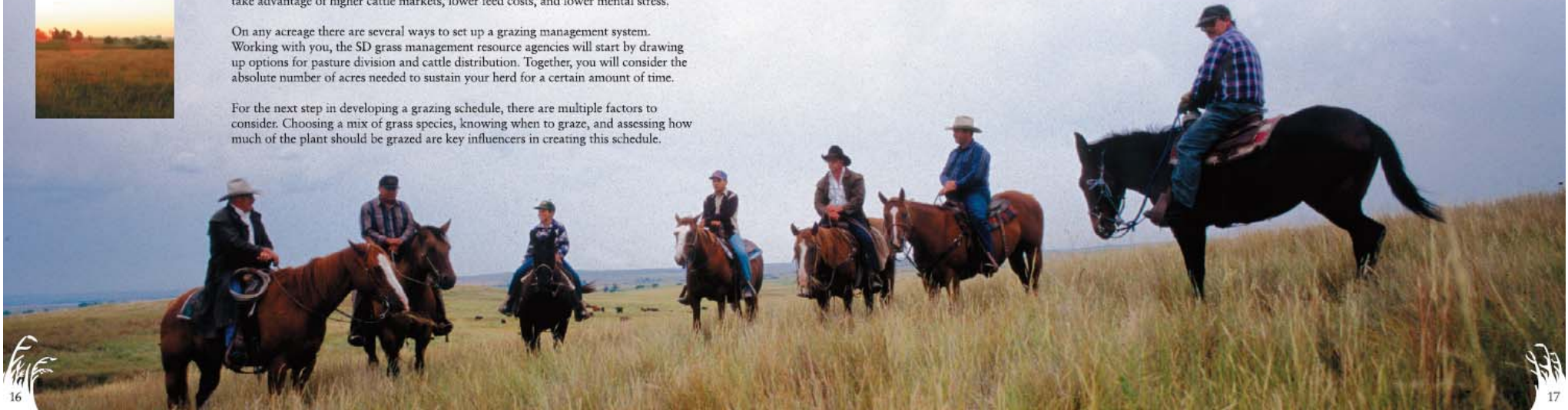


Determining grazing tolerance for your program is site-specific. If you are utilizing existing grassland, refer back to your inventory and review the condition of your grassland. This will help determine the current health of the grasses and whether they need rest. If you are using converted farmland, be sure the newly-planted species are established before you begin grazing.

It is important to consider the amount of use that occurs on the plants during the growing season. You should leave at least 50% of the leaf area so that the plant can continue to carry out the process of photosynthesis. By removing 2/3 of the leaf length, you remove about 50% of the leaf area. The lesson learned here is that it is important to leave at least half of the green and growing leaf area on the plants being grazed by livestock.



Once you've assessed the health of the grassland, you can set a grazing level. The SDGLC and its grazing land partners, are available to help you determine proper grazing levels.



MONITORING SUCCESS



While periodic monitoring is necessary for continued success, a thorough evaluation in the first few months will tell you a lot about grazing levels, benefits to livestock, and livestock-to-acre ratio. By completing an early assessment, you will be able to adjust necessary variables before getting too far into your program.

Once the initial evaluation is completed, you may set up a periodic monitoring program to determine progress. Scheduled maintenance will vary depending on the program, but is necessary for the success of all grazing management systems. For example, the continuous grazing system will require less monitoring than a four-pasture rotation grazing system. A management-intensive grazing system will require a considerable amount of monitoring in order to manage the system. Monitoring can be considered in two categories:

Short-Term Monitoring:

- daily precipitation
- forage growth rates
- recording dates in and out of a pasture
- livestock class and numbers
- pounds of forage in a pasture before grazing

Long-Term Monitoring:

- pasture production
- pounds of beef per acre
- long-term rainfall records
- stocking rates
- livestock records beneficial to a successful marketing system

Pounds of forage remaining after each grazing must also be documented to determine grazing efficiency and utilization trends.

When assessing the condition of your land and livestock, be sure to keep written records, notes, and documentation of everything you evaluate including precipitation levels, grazing dates for each unit, and the condition of more sensitive areas such as stream banks. This will be helpful for future assessments and comparisons, and may also give you insight into the trends of your grass species.



DEMONSTRATION SITES

In keeping with the goal of providing information transfer, the SDGLC and their grassland management resource partners developed various managed grazing demonstration sites scattered throughout the state. The intent was to have sites run by producers, not researchers, with results recorded and shared. Because accurate sampling is part of the process, fecal and water samples are taken at the demonstration sites. Also, forage production is measured and recorded before and after paddock occupation. As a component of the informational aspect of the sites, the project has provided information and education on managed grazing by holding tours at the sites for producers and other interested parties. On-site reports, findings, and results are available on the following website link:
<http://www.sdconservation.org/grassland/managing/gmd/index.html>

Success is measured through a variety of monitored qualities including water infiltration rates, soil composition and plant improvement.



FAULSTICH SITE PROFILE

Hyde County

FAULSTICH SYSTEM Hyde County

Replacement Heifers
320 acres

Located in Hyde County, the Daybreak Ranch manages a 320-acre, 21-pasture grazing system. The Faulstich ranch produces healthy levels of western wheatgrass, needle grass and side oats grama. Other grasses include native big bluestem, little bluestem and switchgrass. Introduced species include smooth brome and crested wheatgrass, meant for cool grazing seasons.

The Red Angus/South Devon herd at the Daybreak Ranch's rotation depends on pasture size and moisture levels. To protect the quality of the range's natural pond, Faulstich installed an above-ground pipeline and tanks for the herd. This, and the adjustment of some pasture fences, reduced the use of the pond as a drinking source for livestock.



SIP SITE PROFILE

Charles Mix County

SIP SYSTEM Charles Mix County

Yearling Steers
230 acres

Resting on 230 acres in Charles Mix County is the Sip grassland management project. The Sip ranch is made up of primarily brome grass, sedges, bluegrass and intermediate wheatgrass. There are also trace amounts of western wheatgrass, big bluestem and switchgrass. The soil throughout the site is silty, a good representation of the county's rangeland.

Within the 230-acre site are eight paddocks, varying from 20 to 35 acres each. The amount of grazing area needed is controlled daily by poly wire fencing, allowing Sip to respond easily to changes in forage quality and quantity.

Water is distributed via a pipeline and two tanks, each tank serving four of the eight paddocks. The paddocks are set up in two groups of four allowing the water tanks to be set up at the paddock intersections.



GLOSSARY

buffers – living filters. Most are relatively narrow strips of land featuring a permanent cover of plants, including grass, shrubs and/or trees. They protect elements of the natural environment from damage, i.e. streams, lakes, or man-made structures such as buildings or roads.

carrying capacity – the maximum stocking rate possible without inducing permanent or long-term damage to vegetation or related resources. The rate may vary from year to year in the same area as a result of changes in forage production.

continuous grazing – a one-pasture system that allows livestock to continually graze on a large section of land.

cool season plants – plants that make most of their growth and flowers during spring and early summer, slows growth or becomes dormant during the hot part of summer, may resume growth in the fall with the advent of cooler temperatures, and has value in grazing management.

decreaser – plant species of the original vegetation that decreases in relative abundance with grazing pressure, fire, drought, or other continued disturbance.

diversity – a measure of the number of species and their relative abundance in a community; a variety of living things.

erosion – the detachment and movement of soil or rock fragments by water, wind, ice or gravity.

forage – browse and herbage that is available and acceptable food to grazing animals, or that can be harvested for feeding purposes.

grassland – any land on which grasses are the dominant plants; may be naturally occurring (native) or cultivated.

grazing management – manipulation of grazing and browsing animals to accomplish a desired result.

habitat – place where a plant naturally grows: a swamp, ridge top or prairie.

harvest efficiency – the total percent of vegetation harvested by a machine or ingested by a grazing animal compared to the total amount of vegetation grown in the area in a given year.

increaser – plant species that is part of the original vegetation and increases in relative abundance, at least for a time, under continued disturbances like grazing, fire or drought.

introduced species – a species that is, in general, from a different continent and not part of the original fauna or flora of the area in question.

livestock – domestic animals used for the production of goods and services.

management-intensive grazing – a goal-driven approach to grassland management and utilization that can include a grazing system that utilizes multiple pastures and frequent rotation of livestock that results in long rest periods for grasses and high forage production.

native species – a species, in general, from the same continent, that is part of the original fauna or flora of an area.

overgrazing – grazing that exceeds the recovery capacity of the individual species or the plant community.

riparian area – an area, zone and/or habitat adjacent to streams, lakes, or other natural free water that have predominant influence on associated vegetation or biotic communities.

rotational grazing – a grazing system that utilizes more than one pasture and rotates cattle from one pasture to the next at varying intervals.

shrub – a plant that has persistent and woody stems, a relatively low growth habit, and generally produces several shoots at the base instead of a single trunk. A shrub differs from a tree in its low stature and form. Maximum height is generally four meters.

stocking density – the relationship between number of animals and area of land at any instance of time.

Stocking rate – The number of specific kinds and classes of animals grazing or utilizing a unit of land for a specific period of time.

warm season plants – plants that make most or all of their growth during the late spring and summer, flowers in the summer or autumn, and has value in grazing management.

weeds – plants that grow unabated, are often introduced, are aggressive competitors, can be troublesome and have a negative impact in natural plant communities or cropland.



CONTACTS

South Dakota Grassland Coalition (SDGLC)
www.sdgrass.org

Natural Resources Conservation Service (NRCS)
Fed Bldg., Room 203 • 200 Fourth Street • Huron, SD 57350-2475
605-352-1200 • <http://www.sd.nrcs.usda.gov/>

United States Fish and Wildlife Service – Private Lands Office
520 B, 3rd Ave N • PO Box 247 • Brookings, SD 57006
605-697-2500 • <http://mountain-prairie.fws.gov/PFW/SD/sd1.htm>

South Dakota State University (SDSU) – Dept. of Animal & Range Science
North Campus Drive • Box 2170 • Brookings, SD 57007
605-688-5165 • <http://ars.sdstate.edu/faculty/Dunn/departamentofrangescience.htm>

South Dakota State University – West River Ag Center
1905 Plaza Blvd • Rapid City, SD 57702-9302
605-394-2236 • <http://wrac.sdstate.edu/>

Grazing Lands Conservation Initiative (GLCI)
www.glci.org

Society of Range Management (SRM) – South Dakota Section
<http://sdsrm.sdstate.org/>

South Dakota Game, Fish and Parks – Wildlife Division
523 East Capitol • Pierre, SD 57501
605-773-3658 • <http://www.sdgamefishandparks.gov/Wildlife/privatelands/Index.htm>

CREDITS

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South Dakota Cattlemen's Association
South Dakota's Conservation Districts
South Dakota Department of Agriculture
South Dakota Department of Environment and Natural Resources
South Dakota Department of Game Fish and Parks
South Dakota Grassland Coalition
South Dakota State University (SDSU) Department of Animal & Range Science
South Dakota Stockgrowers Association
United States Dept of Agriculture Natural Resources Conservation Service (NRCS)
United States Dept of Agriculture Resource Conservation and Development (RC&D)
United States Department of Interior Fish and Wildlife Service
United States Environmental Protection Agency (EPA)

Photos courtesy of: NRCS, SDGLC, Insight Marketing Design

APPENDIX H

PowerPoint on Demonstration Sites

Management Intensive Grazing Demonstration Projects



What is Management Intensive Grazing?

- A sequence of *Rotational Grazing*
- Aimed to maximize harvest efficiently of available grass production
 - Customized to producers need
 - Increase grass quality in pasture
- Increase pounds of beef produced per acre

How did this get started in South Dakota?

- American Creek Conservation District sponsored a grant from the Conservation Commission
- Grassland Coalition sponsored the EPA 319 Grant
- The two grants combined allows these demonstration projects to be evaluated for up to ten years for variety of market, climatic, and social conditions
- Working Agreement with the South Dakota Association of Conservation Districts, Grassland Coalition, and the American Creek Conservation District

Where are the six MiG Demonstrate Projects located?

Blair
Meade Co.

Faulstich
Hyde Co.

Scott
Spink Co.

Carlson
Kingsbury Co.

Karlen
Lyman Co.

Sip
Charles Mix Co.

Faulstich MiG Demonstration

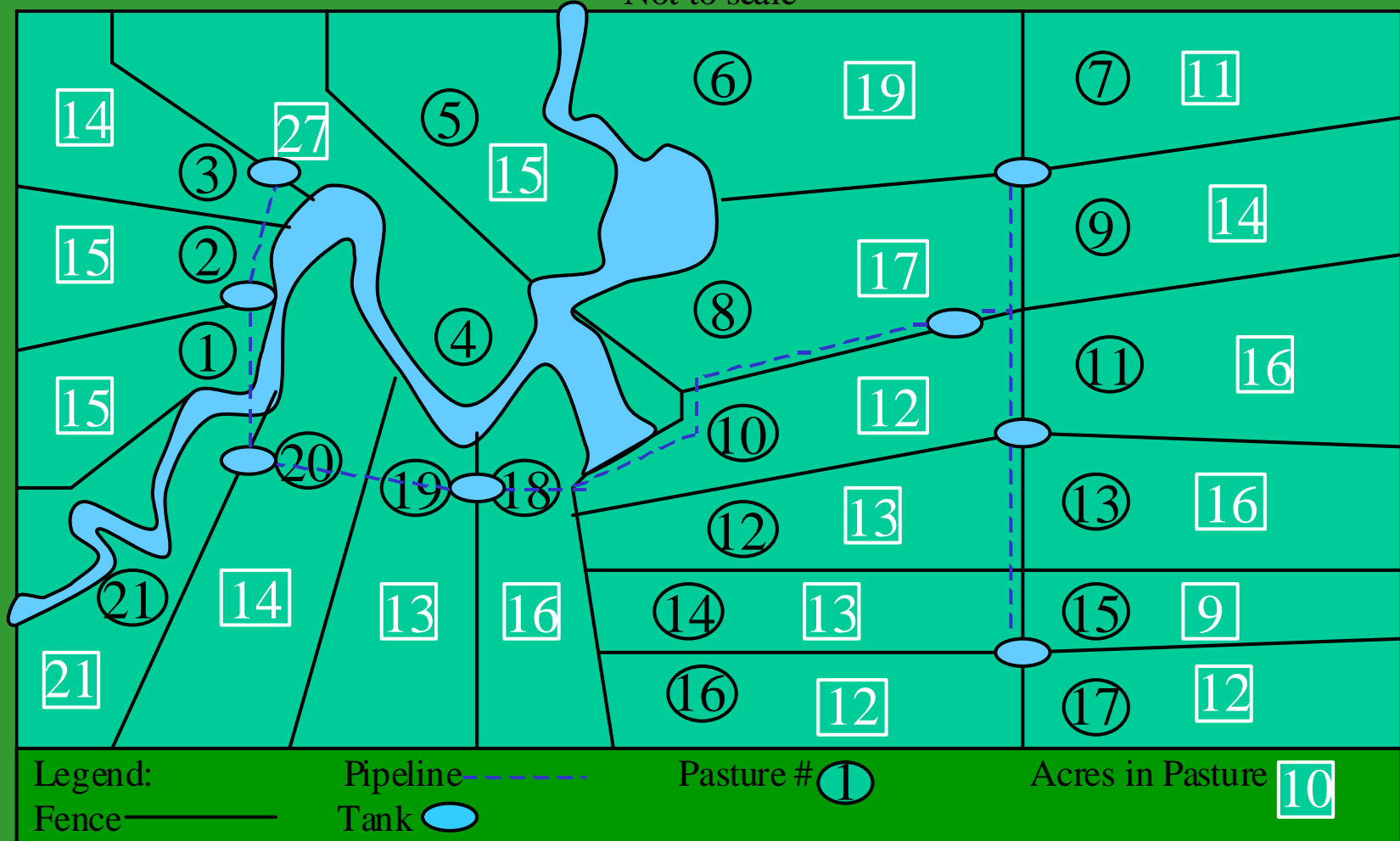
- 320 acre with 21 pastures ranging from 9 acres to 27 acres
- Native rangeland composed of silty clay loam soils. Dominant range sites are silty, clayey, and claypan
- Primary Plant Species are Western Wheat Grass, Needle Grass, and Side Oats Gramma
- Occasional Grasses: Big Blue Stem, Little Blue Stem, and Switch Grass
- Red Angus, South Devon, and Hereford heifers 14 to 15 months of age
- Moved every 1 to 3 days depending upon grass production

Jim Faulstich's MIG Project

320 Acres, Hyde County, SD

Layout of the Pastures

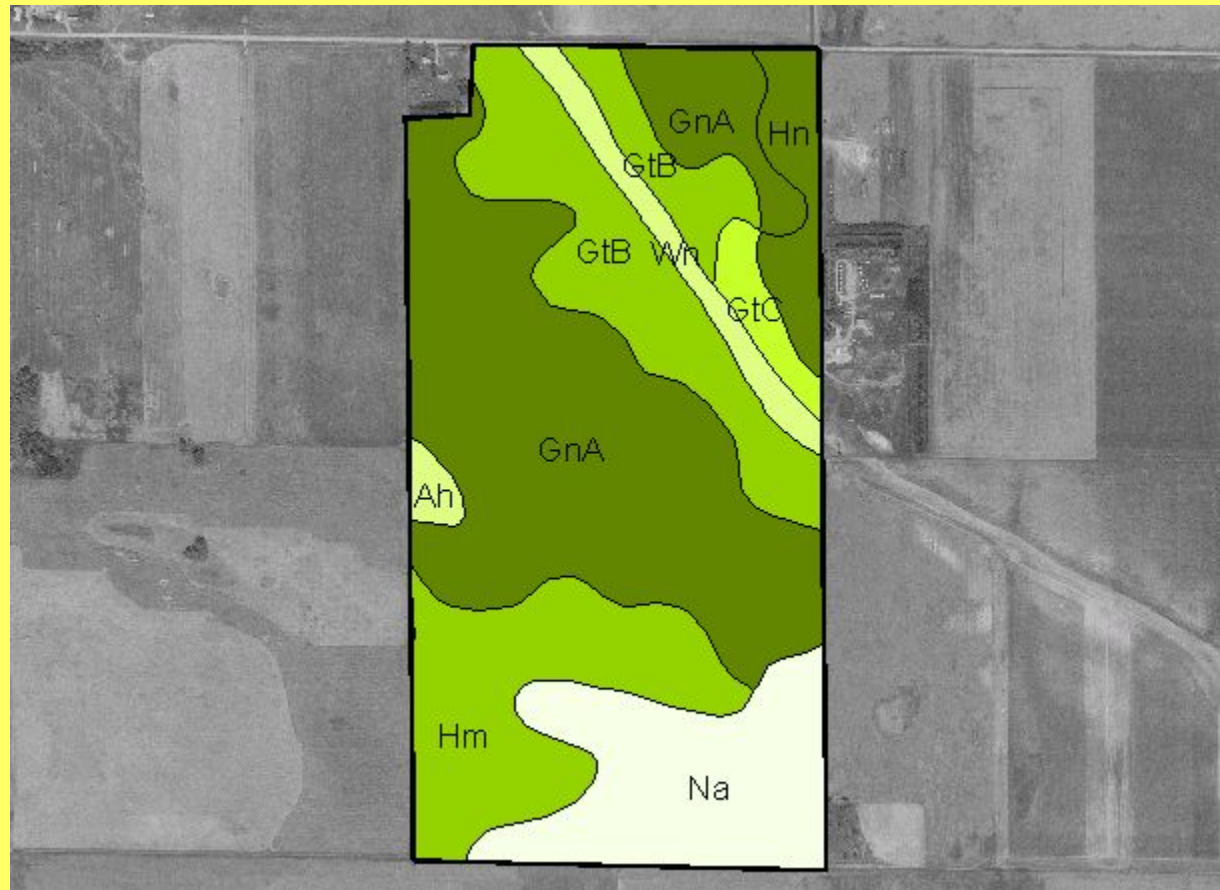
Not to scale



Scott MiG Demonstration

- 315-acre pasture
- 235 acres was seeded to alfalfa, orchard grass, intermediate wheat grass, and meadow brome
- 80 acres consisted of alfalfa, smooth brome grass, and some other native species.
- 160 head of bred Angus cows (started calving mid-May)
- Monitoring: forage weight, height and fecal samples
- Water development and fencing
- This site is along the James River north of Redfield

Scott MiG Map





Karlen MiG Demonstration



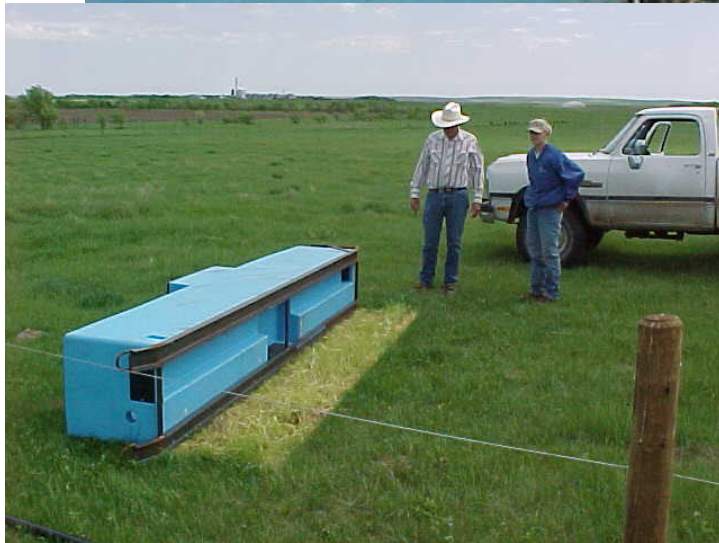
- 482 acres of rangeland
- Claypan, Shallow and Clayey Ecological Sites prevalent in the pasture
- Primary plant species are western wheatgrass, sideoats grama, blue grama, sedges, and Kentucky bluegrass
- Big bluestem and little bluestem – Shallow
- 175 Hereford X Angus cow calf pairs on 482 acres
- From May 25th to, tentatively, September 10th
- Cows moved daily
- Paddocks size range from 8 to 30 ac/day

Karlen MiG Map



What about Water?

- Water is moved in two 110 gallon tanks every day
- There is one and a half miles of black pipe on the ground with quick-connectors every 500 feet



What is monitored on all systems?

- Forage (long- & short-term)
 - Density – 100ft transect
 - Species
 - Height
 - Quality
 - Quantity lbs/ac



- Herd Health
 - Weight
 - Body Condition Score
 - Etc.
- Daily Journal

Other things monitored

Wildlife - Song birds

Water Quality

Soil

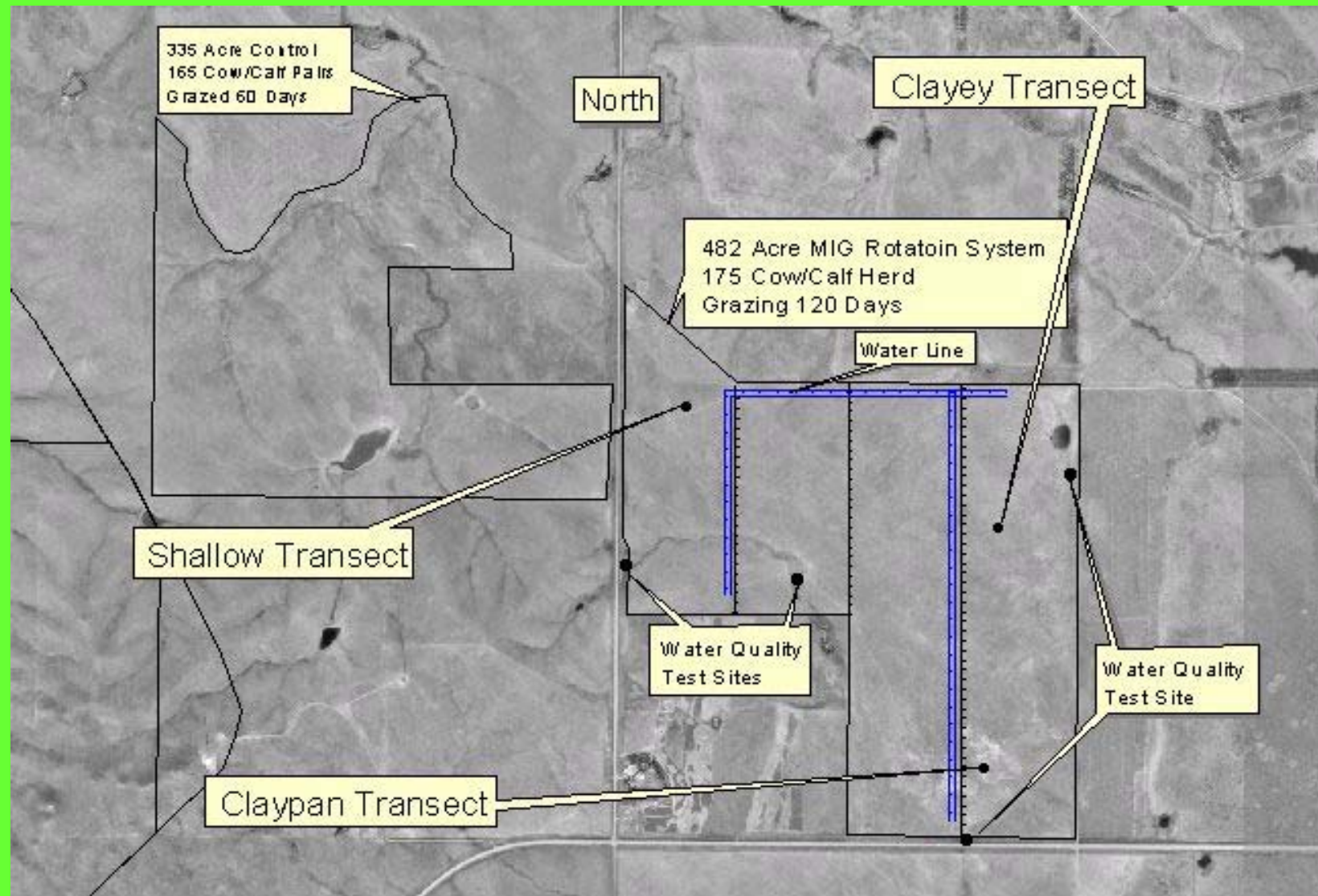
Weather

Wildflowers



Dung Beetles can bury up to 1,000 lbs. of nitrogen per acre.

Karlen MiG and Control Pastures



Karlen MiG Rotations

- Three Rotations
 - Rotation 1 – May 26 – July 8
 - 44 days 38 paddocks 2106 lbs of DM/ac
 - Rotation 2 – July 9 – August 16
 - 37 days 27 paddocks 1736 lbs of DM/ac
 - Rotation 3 (partial) August 16 – Sept. 8?
 - 20 days? 14 paddocks? 1350 lbs of DM/ac

Karlen MiG Compared Final Weights

Control

- 514 acres
- Beginning Cow/Calf Weights of 211,145 lbs..
- Ending Cow/Calf Weights of 271,550 lbs.
- Total lbs./acre of 111.65 lbs.

MiG

- 482 acres
 - Beginning Cow/Calf Weights of 232,901 lbs..
 - Ending Cow/Calf Weights of 296,598 lbs.
 - Total lbs./acre of 132.15 lbs.
- 111.65 lbs./acre to 132.15 lbs./acre
 - Difference of 20.5 lbs./acre

What do we intend to learn?

- Demonstrate what works the best
- Demonstrate a variety of grazing sequences
- Demonstrate on site tours to other producers
- Compile data for future use



APPENDIX I

Coping With Drought PowerPoint

Coping With Drought

Dave Steffen
34110 294th St
Burke, SD 57523
dsteffen@gwtc.net
605-775-9112

How Bad is the Drought?

Does the drought cover a large area?

What's the forecast?

What are the conditions on my place?

What needs to be done to survive?

How serious are the invading plants?

How can I change stocking rates?

Should I fertilize my grass?

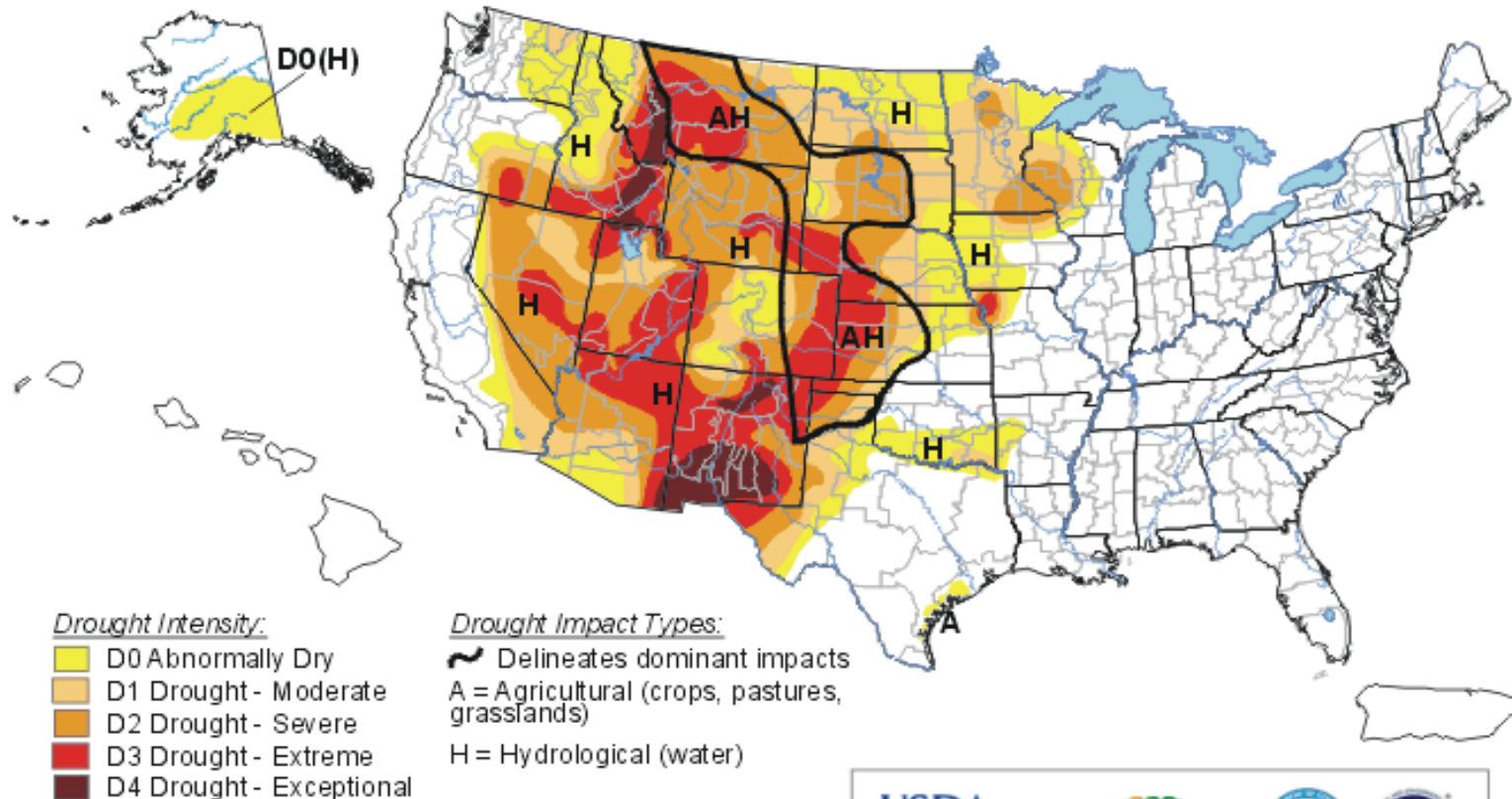
How do I get water to dry pastures?

Area of Drought

U.S. Drought Monitor

March 2, 2004

Valid 7 a.m. EST



The Drought Monitor focuses on broad-scale conditions.
Local conditions may vary. See accompanying text summary
for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, March 4, 2004
Author: Richard Tinker, NOAA/NWS/NCEP/CPC

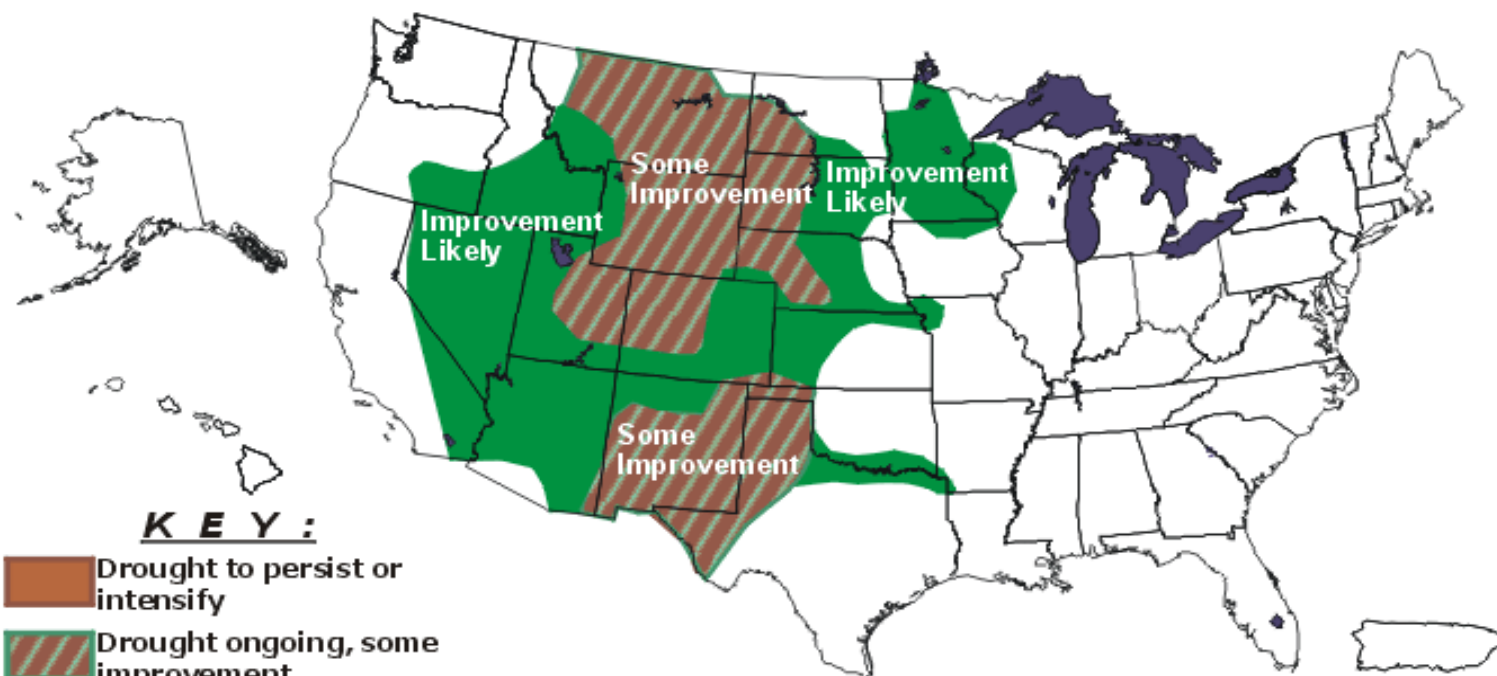
Forecast Conditions







U. S. Seasonal Drought Outlook

Through May 2004

Released February 19, 2004



KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short and long-range statistical and dynamical forecasts. Short-term events-- such as individual storms-- cannot be accurately forecast more than a few days in advance, so use caution if using this outlook for applications-- such as crops-- that can be affected by such events. "Ongoing" drought areas are schematically approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text.

Weather Records for the Ranch

Steffen Farm Precipitation

8 year
av
er
ag
e

Gregory SD

shortfall

Mo. %

| Month | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | Average | 2004 | 30 Yr Ave | variance | to date | of Normal |
|-------|------|------|------|------|------|------|------|------|---------|------|-----------|----------|---------|-----------|
| Jan | 0 | 0 | 0.31 | 0.1 | 0.23 | 0.56 | 0.08 | 0.33 | 0.20 | 0.16 | 0.59 | -0.43 | -0.43 | 27% |
| Feb | 0.1 | 0.66 | 0.23 | 0.37 | 0.47 | 0.47 | 0 | 0.37 | 0.33 | 0.6 | 0.65 | -0.05 | -0.48 | 92% |
| Mar | 0.42 | 0.4 | 1.43 | 0.78 | 0.48 | 0.50 | 0.64 | 0.35 | 0.63 | | 1.83 | -1.83 | -2.31 | 0% |
| Apr | 1.28 | 2.83 | 1.39 | 5.14 | 1.8 | 5.82 | 1.49 | 2.42 | 2.77 | | 2.73 | -2.73 | -5.04 | 0% |
| May | 6.97 | 2.56 | 2.26 | 4.76 | 2.9 | 3.11 | 1.9 | 3.75 | 3.53 | | 3.41 | -3.41 | -8.45 | 0% |
| Jun | 2.29 | 2.1 | 4.91 | 5.43 | 3.25 | 3.77 | 1.07 | 2.04 | 3.11 | | 3.75 | -3.75 | -12.20 | 0% |
| Jul | 2.41 | 6.02 | 4.51 | 3.08 | 1.73 | 4.82 | 0.44 | 1.21 | 3.03 | | 3.33 | -3.33 | -15.53 | 0% |
| Aug | 2.13 | 2.56 | 2.36 | 0.35 | 1.12 | 0.98 | 1.88 | 2.13 | 1.69 | | 2.38 | -2.38 | -17.91 | 0% |
| Sep | 8.43 | 2.05 | 0.91 | 2.09 | 0.31 | 3.05 | 1.48 | 0.51 | 2.35 | | 2.55 | -2.55 | -20.46 | 0% |
| Oct | 2.05 | 2.32 | 4.69 | 0.09 | 2.61 | 0.11 | 1.88 | 1.34 | 1.89 | | 1.58 | -1.58 | -22.04 | 0% |
| Nov | 1.3 | 0.18 | 1.01 | 0.18 | 1 | 1.11 | 0.09 | 0.77 | 0.71 | | 0.98 | -0.98 | -23.02 | 0% |
| Dec | 0 | 0.09 | 0.01 | 0.08 | 0.11 | 0.01 | 0.1 | 0.19 | 0.07 | | 0.81 | -0.81 | -23.83 | 0% |

| | | | | | | | | | | | |
|-------|------|-------|----|------|----|------|-------|-------|-------|------|-------|
| Total | 27.4 | 21.77 | 24 | 22.5 | 16 | 24.3 | 11.05 | 15.41 | 20.30 | 0.76 | 24.59 |
|-------|------|-------|----|------|----|------|-------|-------|-------|------|-------|

What about the past 6 months?

- 30 Year av. for Sep to March= 7.16 in.
- Ranch precip for Sep to March= 3.57 in.
- Precipitation equals 50% of 30 Year Av.
- Consider a 50% reduction in stocking rate (based on Ranch Drought Management Plan guidelines)

Cut Stocking Rate by 50%?

- That's pretty hard for me to do according to the banker
- Are there any other alternatives?
- Well ---
- That depends on what you have to work with (look at the ranch resource inventory)

Drought Management Considerations

- Plant & Graze annual forage crops
- Graze hayland
- Consider grazing crop aftermath
- Rent more grazing land
- Reduce the herd
- Wean early
- Intensify grazing management (MiG)

Intensify Grazing Management?

- Determine forage requirement for the herd
- How do I do that?
- Determine the average weight of the herd individual
- $\text{Av. Wt.} \times 2.6\% \times 30 \text{ days} = \text{lbs of DM forage consumed in 1 month}$
- $\text{Lbs consumed} \times \text{number in herd} = \text{forage needed to feed the herd for a month}$

Grazing Management (cont. 1)

- So - if you have a resource inventory of all your pastures, you should have an idea of how many Animal Unit Months of forage is available in each pasture.
- But - if you do not have an inventory, or you think it is not accurate because it has been dry for several years, you should take a new look at each pasture

Grazing Management (cont.2)

- Estimate forage production (dry matter basis) by clipping plots, using a pasture stick, or pasture meter
- Consider how much grass you want to leave in the pasture for cover
- $\text{DM est.} - \text{residual} \times \text{acres in pasture} = \text{lbs of forage available in the pasture}$
- $\text{Available forage} / \text{herd requirement} = \text{months of grazing on hand}$

What about water?

- Good quality livestock water is a necessity
- Above ground pipe is a good way to distribute water if a reliable source is available.

Grazing Management (cont.3)

- Concentrate on plants you want
- Don't be too concerned about the undesirables like sagewort. These plants will decrease when moisture comes back. Most are short-lived perennials.

Grazing Management (cont.4)

- Keep in mind the rule of take half and leave half of the current years growth
- When plant growth is rapid, move rapid.
- When plant growth is slow, move slow.
- Put as many cattle in a herd as possible and plan moves to allow the most amount of rest to the plant community.

Does Fertilizing Pasture Pay?

- Usually not on permanent pastures
- Best thing is to consider mineral cycling with livestock
- Keep pastures small and stock density high
- Consider and manage for dung beetles that recycle manure back to the soil and plant community

The Critters Recycle



Time for questions



Summary

- Consider the conditions on the ranch
- Inventory what you have (livestock & grass)
- Measure the forage on monthly basis
- Combine herds and allocate forage
- Decide in advance what you will do
- Rain and Rest grows grass!

APPENDIX J

Watering Facilities PowerPoint

Watering Facilities

Justin “Judge” Jessop
Project Coordinator
Grasslands Management &
Planning Project

Grasslands Management & Planning Project

Three Parts

1. Demonstrations site across the state
2. Provide Technical assistance to producers
3. Provide Education (Bus Tours, Grazing school, HRM Workshops)

Where are the two MiG Demonstration Projects located?

Faulstich

Hyde Co.

Sip

Charles Mix Co.

Technical Assistance





Bus Tour

**So, I am here talk
about what my
brother and I do at
our places.**

Disclaimer!!

1. I am not an ***ENGINEER!***
2. These systems are based on trial and error.
3. They require a certain degree of monitoring.
4. **None** of the items were **cost shared**.



Larry, The Head Herdsman



Tinker & Bell



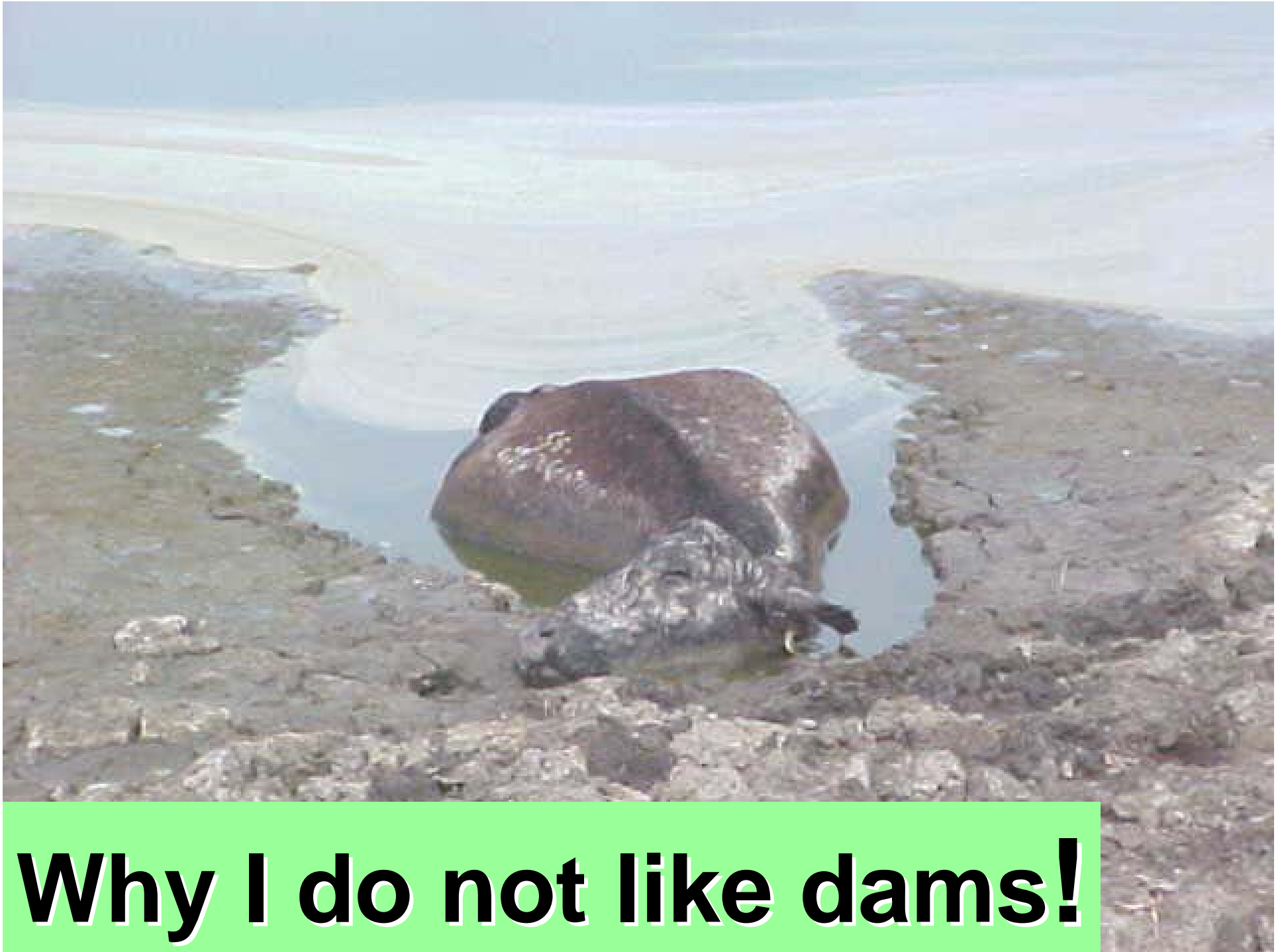
How much water do ya' need?

NRCS says for a:

- Cow/calf pair needs 18 gal/day.
- 800 lb. growing animal 15 gal/day.
- Mature horses 18 gal/day.
- Ewes with lamb(s) 3 gal per day.
- *I had one producer tell me that if you are hauling water cows need 36 gal/day.*

Dams





Why I do not like dams!

Too much iron in H₂O!



2,200 head x 15 gal/day=
33,000 gallons of water per day!
33,000 gal/ **1,440** min/day=**23**gpm

We would need 3 30ft. diameter
tanks to provide one day's water
in each paddock!



**Could we use
something to
haul water?**

No!

A photograph of a rusty metal frame, possibly a ramp or a small trailer, sitting on a grassy area. In the background, there is a blue building with a corrugated metal roof and a tree. The text "What I use." is overlaid on the bottom left of the image in a green box.

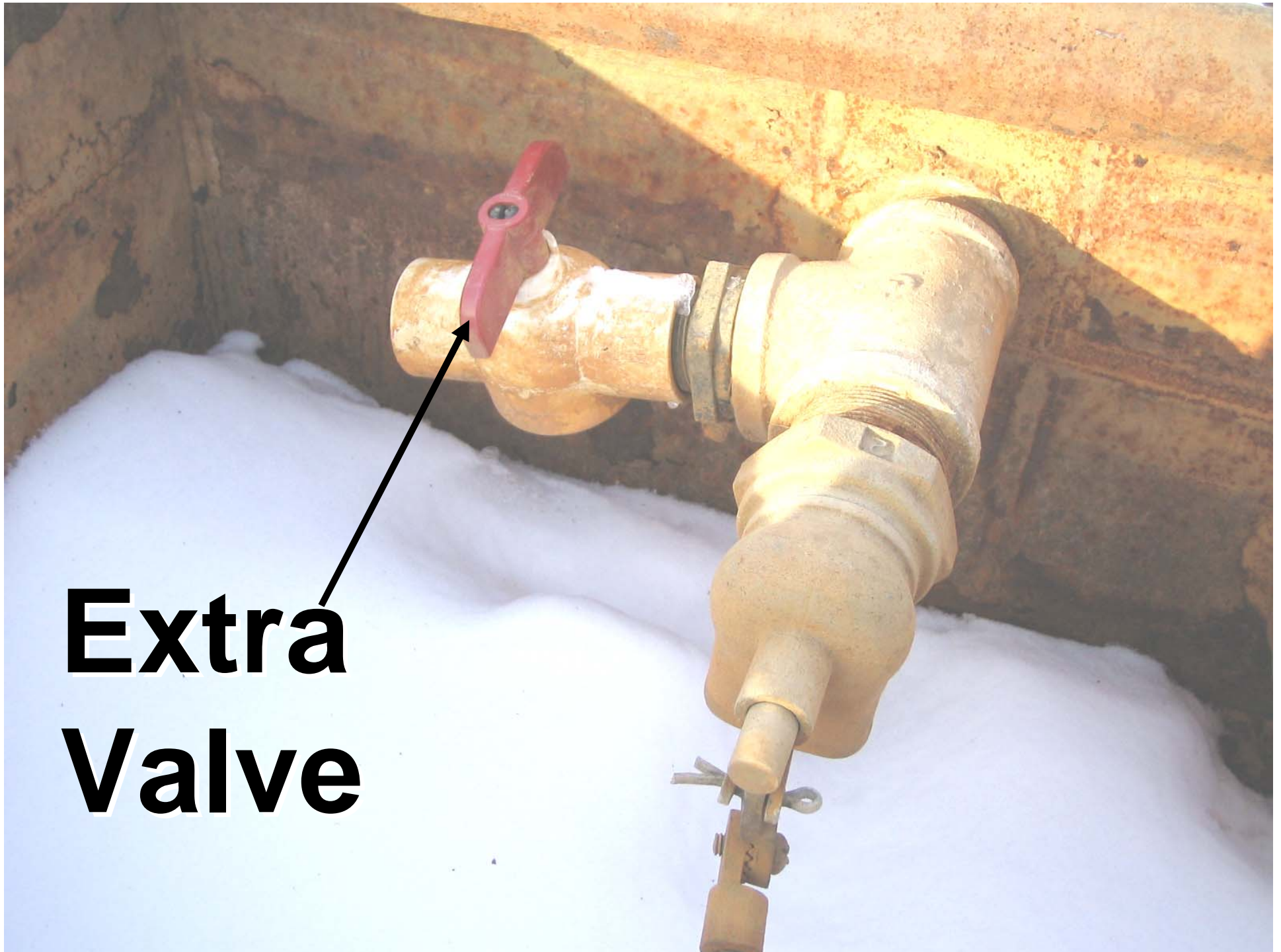
What I use.



What my brother uses.



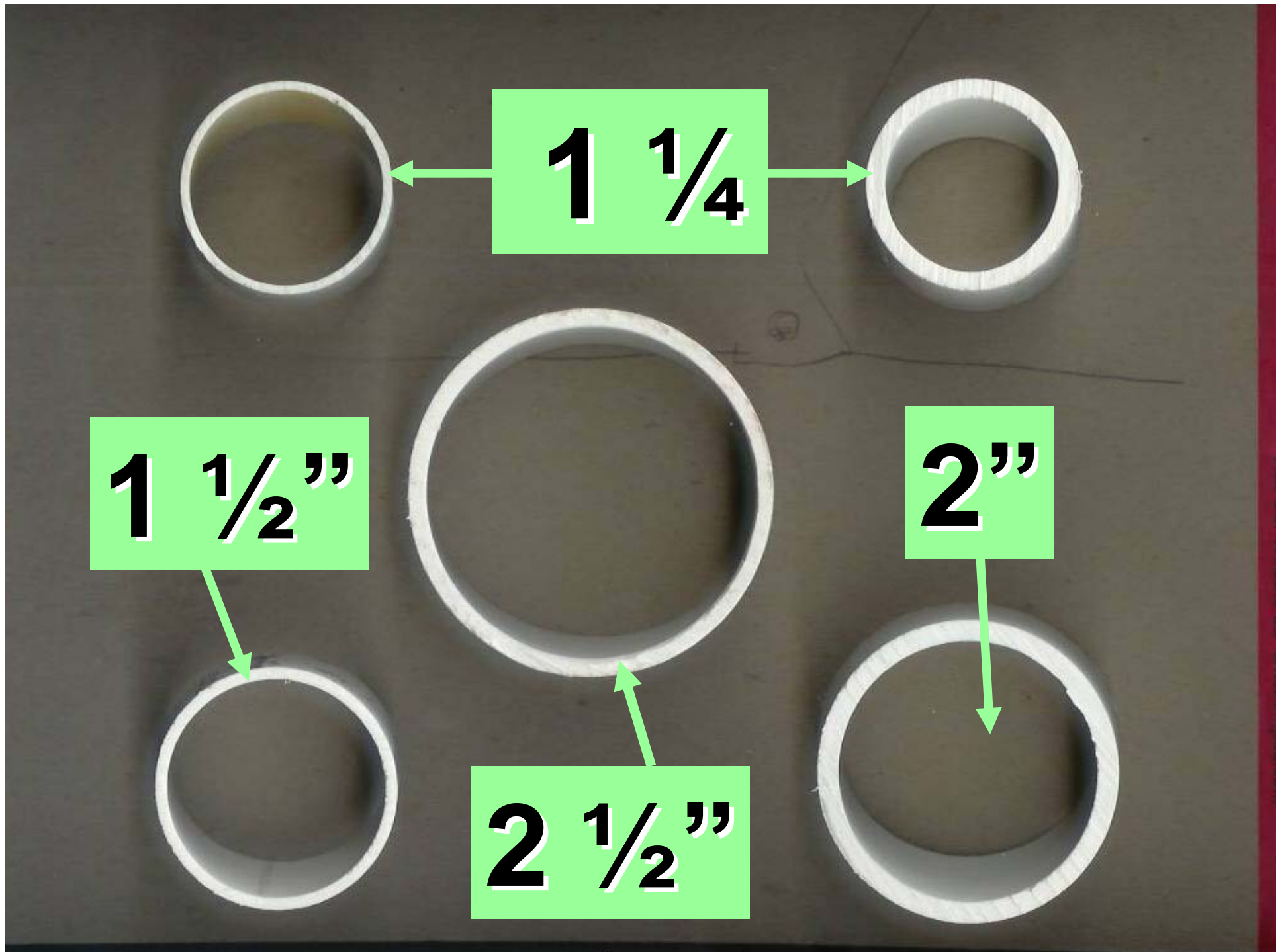
Dual purpose



**Extra
Valve**

Bottomless Tanks





Pipe quality is not a concern until you pay these!

This is your payment chart record

MAY 2002

| | | |
|----------------------------|-----------------------------|---------|
| | Account No. | 5627.00 |
| Present Meter Reading | 276 | 000 |
| Previous Meter Reading | 198 | 000 |
| Total Gallons Used | 78 | 000 |
| Amount Due From Rate Chart | 215 ⁰⁰ | |
| Penalty Fee | | |
| Other Charges or credit | 215⁰⁰ | |
| Amount you pay | 215 | |

This is your payment chart record

FEBRUARY 2003

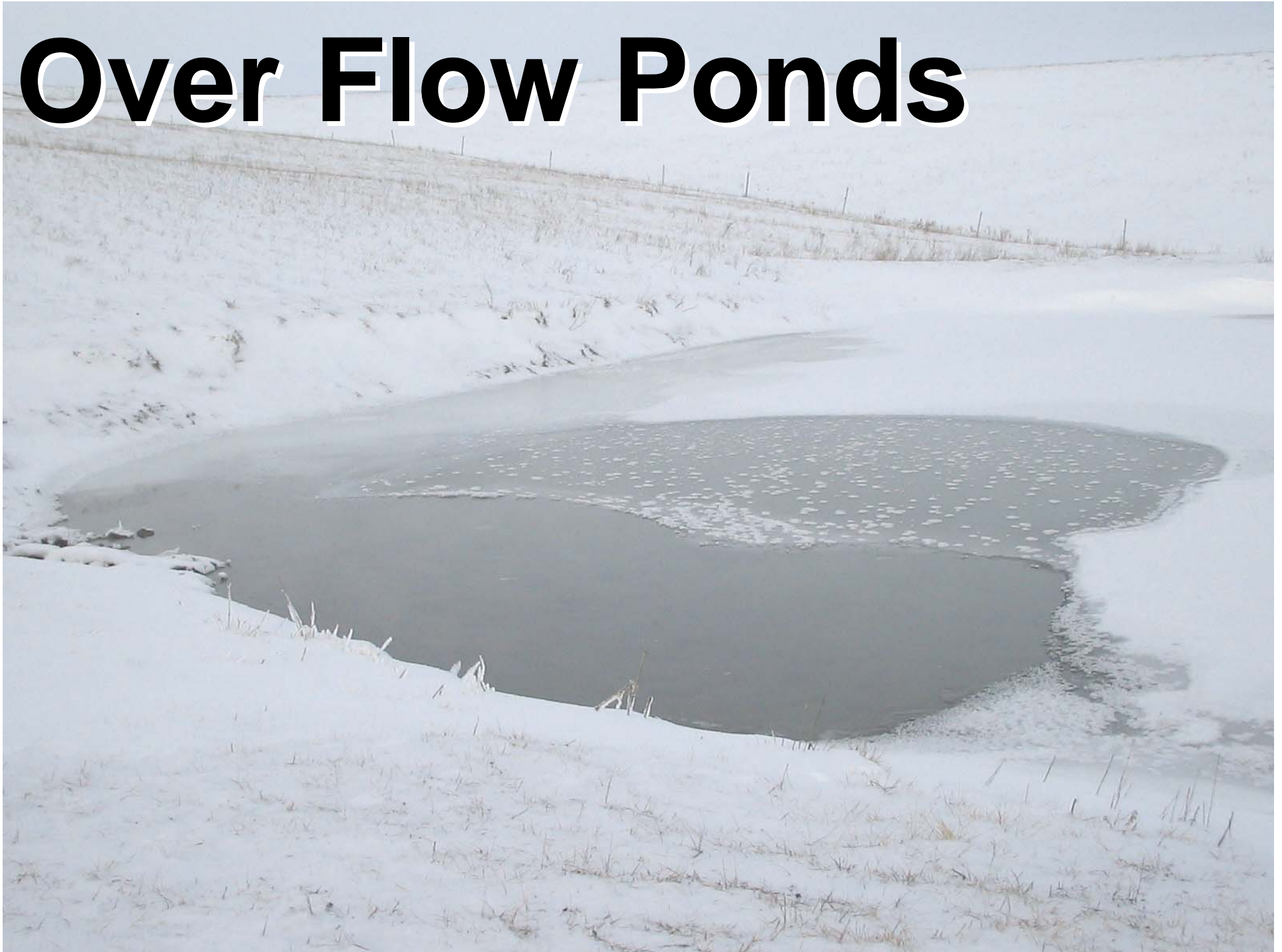
| | | |
|----------------------------|-------------------|---------|
| | Account No. | 5627.00 |
| Present Meter Reading | 508 | 000 |
| Previous Meter Reading | 468 | 000 |
| Total Gallons Used | 40 | 000 |
| Amount Due From Rate Chart | 120 ⁰⁰ | |
| Penalty Fee | | |
| Other Charges or credit | | |
| Amount you pay | 120 ⁰⁰ | |

This is your payment chart record

MARCH 2003

| | | |
|----------------------------|-------------------|---------|
| | Account No. | 5627.00 |
| Present Meter Reading | 565 | 000 |
| Previous Meter Reading | 508 | 000 |
| Total Gallons Used | 57 | 000 |
| Amount Due From Rate Chart | 162 ⁵⁰ | |
| Penalty Fee | | |
| Other Charges or credit | | |
| Amount you pay | 162 ⁵⁰ | |

Over Flow Ponds



Overflow pipes



Reservoirs





We put two of these...



Right Here.

The troughs get their water from here.



Chicken Waterer



Chicken waterer with the water trough connected to it.



Recovery Time

- Many livestock numbers can be watered out of a little tank, provided there is quick recovery of the water.
- Livestock will “*wait*” in line to drink if they *trust* the water will be there.

**Remember
3 things**

**#1. Trust
has to be earned!**

#2. Remember!!!!

- We (~~Jeff~~ ~~Larry~~) check the yearlings at least twice a day, more like three times per day. I check the cows at least once a day.



#3. If your neighbors think you are nuts, you're doing something right.

2005

- **Ran from May 18 to September 16**

2006

Ran from May 1 to August 8

Rainfall-2005

| | <u>30 yr avg</u> | <u>2006</u> |
|-----------|------------------|--------------|
| January | 0.25 | 0.50 |
| February | 0.48 | 0..22 |
| March | 1.24 | 1.27 |
| April | 2.06 | 0.91 |
| May | 3.02 | 0.62 |
| June | 2.98 | 0.85 |
| July | 2.77 | 0.62 |
| August | 2.02 | 2.40 |
| September | 1.47 | 2.20 |
| October | 1.06 | 0.10 |
| November | 0.51 | 0.38 |
| December | <u>0.35</u> | <u>0.00</u> |
| Total | 18.21 | 10.17 |

Load out Day

The Crew



More Crew



With permission of the *Argus Leader*



The Head Herdsman

A thought to go home on...

“Never be afraid to try something new. Remember that a lone amateur built the Ark. A group of professionals built the Titanic.”

- Dave Barry

Any Questions?



APPENDIX K

SDSU Report on Demo Sites

South Dakota Grassland Coalition Managed Intensive Grazing System Report: Demonstration Sites (2000-2006)

Alexander J. Smart

Summary

Collecting long-term forage, livestock, climate, and environmental monitoring data on a ranch is useful for making predictions of forage and animal production and aiding in livestock management decisions that impact economics and the environment. This report summarizes the first six years of an on-ranch study where forage biomass, animal performance, climate, vegetation composition, and water quality data were collected. Regression techniques were used to develop prediction equations to estimate annual forage biomass, summer stocking rate, and beef production using monthly precipitation data. April and May precipitation was the best predictor of forage biomass, stocking rate, and beef gain per acre. Since typical spring turnout on South Dakota pastures occurs in late April or early May, equations based on April and May precipitation provides livestock manager's timely information to make appropriate summer stocking rate decisions. Trends in vegetative composition and water quality data were explained by climatic fluctuations. Recent droughts in South Dakota have had negative impacts on vegetative composition and water quality and quantity. Good grassland management stabilizes forage production and thereby improves the efficiency of the water cycle by reducing runoff; however it can make stock dams a less reliable water source.

Introduction

In the summer of 1999, the Hand and Hyde County Bootstraps group met to form a working group to better understand "Management Intensive" Grazing (MIG) systems. From this working group of ranchers and state and federal agency personnel, evolved a goal to establish six demonstration sites in South Dakota (Figure 1).

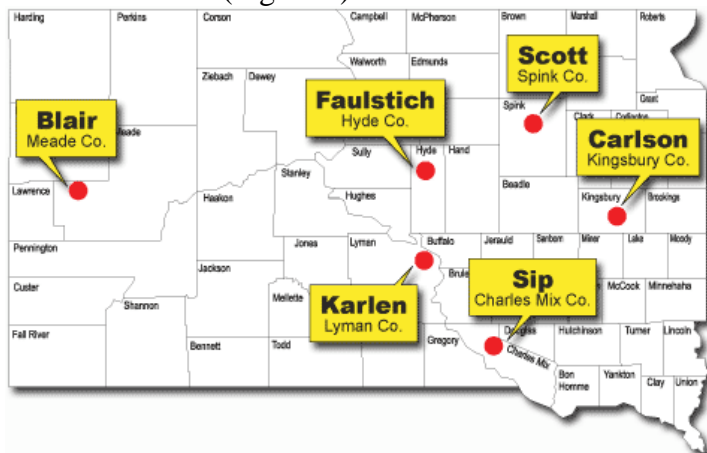


Figure 1. South Dakota Grassland Coalition managed intensive grazing demonstration sites.

This report will focus on only two of the demonstration sites (Faulstich and Sip, see Fig. 1) where consistent and long-term data have been collected. The objectives of this report are to determine the relationship between weather fluctuations on forage production, beef production, species composition, and water quality on two MIG demonstration sites in South Dakota.

Faulstich Demonstration Site

In 2000, the first demonstration site was established by Jim Faulstich near Highmore, SD in Hyde County (Fig. 1). This site is a 320 acre pasture dominated by native mixed-grass prairie vegetation with some introduced species such as smooth brome grass, Kentucky bluegrass, and crested wheatgrass. The pasture was fenced into 21 paddocks and water was developed using aboveground pipeline (Fig. 2).

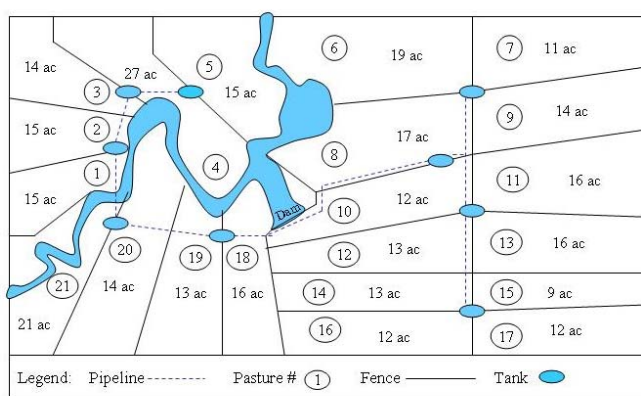


Figure 2. Pasture layout of Faulstich managed intensive grazing demonstration site.

Animal Performance

The pasture was stocked with Red Angus x South Devon cross bred heifers during the summers of 2000 to 2005. Animal performance data during the first six years of the demonstration study are listed in Table 1. In 2002 and 2004, the stocking rate was reduced to compensate for dry conditions. The average number of grazing days supported by the MIG pasture was 124 days. Gain per animal and average daily gain (ADG) was quite consistent except in 2005 for unknown reasons. Gain per acre averaged 38.5 lb/acre over the six years and varied due to yearly stocking rate and ADG differences.

Table 1. Animal performance statistics for the Faulstich MIG demonstration site from 2000 to 2005 near Highmore, South Dakota.

| Item | Year | | | | | |
|-------------------------|-------|-------|-------|-------|-------|-------|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
| Area grazed, acres | 313.7 | 313.7 | 313.7 | 313.7 | 288.5 | 313.7 |
| Stocking rate, AUM/acre | 1.17 | 1.18 | 0.79 | 0.96 | 0.53 | 1.15 |
| Grazing season, days | 119 | 118 | 111 | 132 | 127 | 135 |
| Number of heifers | 100 | 109 | 76 | 71 | 38 | 86 |
| Initial weight, lb | 848 | 784 | 822 | 886 | 874 | 890 |
| Final weight, lb | 1007 | 943 | 949 | 1035 | 1024 | 980 |
| Gain per animal, lb | 159 | 159 | 127 | 149 | 150 | 90 |
| Average daily gain, lb | 1.34 | 1.34 | 1.15 | 1.34 | 1.35 | 0.67 |
| Gain per acre, lb/acre | 50.7 | 55.2 | 30.8 | 33.7 | 19.8 | 24.7 |

Forage Biomass

Forage biomass estimated before cattle grazed each paddock averaged 2200 lb/acre, but varied considerably each year (Table 2). Forage biomass after cattle grazed each paddock was 1200 lb/acre resulting in an average utilization of 42%. The average number of days spent grazing each paddock

was 4 days. Due to dry conditions, forage growth was less in 2002 and 2004 which resulted in longer grazing periods per paddock. Grazing periods per paddock were shorter in 2001 due to good forage growing conditions.

Table 2. Average forage biomass before and after grazing, utilization, and average grazing days per paddock for the Faulstich MIG demonstration site from 2000 to 2005 near Highmore, South Dakota.

| | Year | | | | | |
|--|------|------|------|------|------|------|
| Item | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 |
| Average forage biomass before grazing, lb/acre | 2500 | 3900 | 1200 | 1700 | 1500 | 2500 |
| Average forage biomass after grazing, lb/acre | 1400 | 1800 | 800 | 900 | 900 | 1600 |
| Average utilization, % | 44 | 54 | 33 | 47 | 40 | 36 |
| Average time in paddock, days | 2.8 | 2.2 | 5.0 | 3.2 | 6.6 | 4.5 |

Weather

Precipitation data for 2000 through 2005 and the historic 30 year average are shown in Table 3. Considerable variation existed in the monthly total precipitation each year. Drought conditions exhibited in the 2002 and 2004 forage biomass (Table 2) is in large part due to the amount of April precipitation (Table 3). Spring and summer total precipitation masks the effects of the importance of April precipitation. For example, in 2004, average forage biomass before grazing was 1500 lb/acre even though spring precipitation (April-June) was above the 30 year average (Table 3).

Table 3. April through August, spring, summer, season total, and annual precipitation from 2000 to 2005 and the 30 year average for the Faulstich MIG demonstration site near Highmore, South Dakota.

| | Year | | | | | | |
|----------------------|-------|-------|-------|-------|-------|-------|---------|
| Month | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | Average |
| April | 2.59 | 4.68 | 0.85 | 2.02 | 0.08 | 1.18 | 2.32 |
| May | 4.02 | 2.66 | 1.06 | 2.35 | 4.57 | 2.20 | 3.37 |
| June | 0.84 | 2.04 | 0.95 | 3.75 | 4.98 | 5.14 | 3.19 |
| July | 2.23 | 0.30 | 1.92 | 1.72 | 2.28 | 1.10 | 3.25 |
| August | 0.53 | 0.30 | 4.92 | 1.22 | 2.36 | 0.58 | 2.97 |
| Spring (April-June) | 7.45 | 9.38 | 2.86 | 8.12 | 9.63 | 8.52 | 8.88 |
| Summer (July-August) | 2.76 | 0.60 | 6.84 | 2.94 | 4.64 | 1.68 | 6.22 |
| Season total | 10.21 | 9.98 | 9.70 | 11.04 | 14.27 | 10.20 | 15.10 |
| Annual | 12.55 | 17.16 | 11.55 | 15.10 | 23.99 | 18.61 | 18.57 |

Predictive Tools

Regression equations using monthly total precipitation to predict average forage biomass before grazing, stocking rate and beef gain per acre were evaluated. April precipitation had the greatest ability to adequately predict forage biomass (Fig. 3). These results are extremely valuable since typical pasture turnout dates are late-April to early May in eastern South Dakota. Producers in this region can measure April precipitation and determine the average forage biomass before grazing.

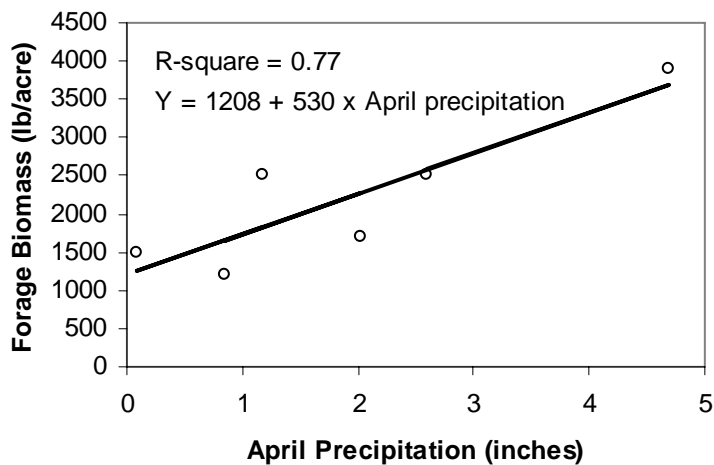


Figure 3. Relationship between average forage biomass before grazing and April monthly total precipitation for the Faulstich MIG demonstration site near Highmore, South Dakota.

Summer stocking rates can be estimated in two ways. The relationship between the actual stocking rate and predicted stocking rate using April precipitation is presented in Fig. 4. Also, stocking rate can be calculated from the predicted forage biomass estimate. For example, the dotted line in Fig. 4 is a calculated estimate of stocking rate based on the forage prediction equation (Fig. 3) and multiplying by 35% harvest efficiency and dividing 780 lb (monthly dry matter intake of forage per 1000 lb animal unit). Notice the calculated estimate over predicts the stocking rate when April precipitation is greater than 4.5 inches compared to the actual stocking rate (Fig. 4).

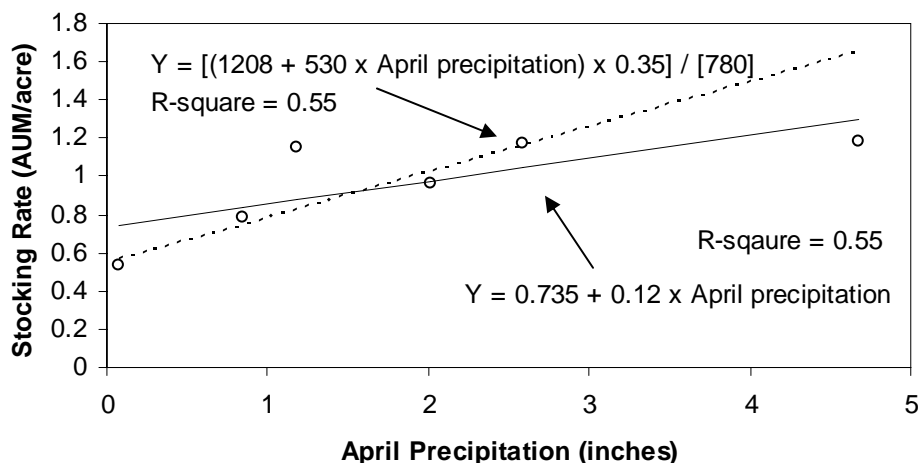


Figure 4. Relationship between actual stocking rate (open circles) and predicted stocking rate using April precipitation (solid line) and calculated stocking rate based on predicted forage production (dotted line) for the Faulstich MIG demonstration site near Highmore, South Dakota.

Finally, beef production per acre was adequately estimated using April precipitation (Fig. 5). Determining the net profit or loss of stocker enterprises can be estimated before the grazing season has started.

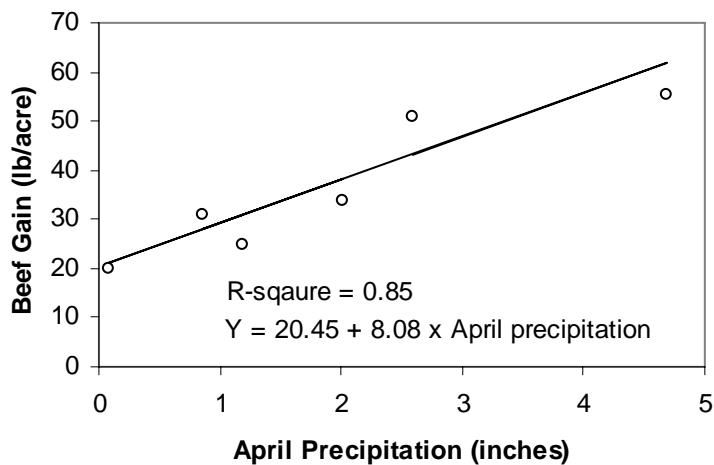


Figure 5. Relationship between beef gain per acre and April monthly total precipitation for the Faulstich MIG demonstration site near Highmore, South Dakota.

Plant Community Monitoring

One of the reasons to monitor key forage species is to determine the impacts that management and climate have on plant community diversity and productivity. In order to do this, two 100-ft permanent transects were established in pastures 12 and 20 (see Fig. 2). The beginning point of each transect was permanently marked with a disk blade and its point was located using GPS and measured from a known landmark. The ends of each transect were determined through sight alignment of a known direction. At 1-ft intervals, along the transect, a metal flag was dropped and the species it hit was recorded. If the flag missed a plant, the observer recorded if it touched bare ground or litter.

The difficulty for the manager is to look back and be able to separate the effects of management and climate. Stocking rate was adjusted according to weather fluctuations. Dry springs occurred in 2002, 2004 and 2005 (Table 3). Species such as Kentucky bluegrass and smooth brome grass appeared to be unaffected by those dry years as their occurrence was relatively stable over the monitoring period (Tables 4 and 5). Native species such as western wheatgrass, green needlegrass, and threadleaf sedge seemed to have decreased in occurrence after the drought of 2002 and successive dry springs of 2004 and 2005 (Tables 4 and 5). Since the turnout date has been typically in May, species such as Kentucky bluegrass and smooth brome grass, that grow earlier in the season probably have been able to escape heavy utilization and thus allowed to expand their frequency of occurrence. Because the various forbs were lumped together, their occurrence appears to be relatively stable over time (Tables 4 and 5), however we know that different species of forbs will react differently to dry and wet years.

Table 4. Frequency of occurrence (%) of pasture species, bare ground, and litter recorded in late May in pasture 12 from 2000-2005 for the Faulstich MIG demonstration site near Highmore, South Dakota.

| | Year | | | | | |
|--------------------|------|------|------|------|------|------|
| Species | 2000 | 2001 | 2002 | 2003 | 2005 | 2006 |
| Kentucky bluegrass | 13 | 18 | 15 | 19 | 25 | 25 |
| Smooth brome | 3 | 6 | 4 | 5 | 4 | 32 |
| Western wheatgrass | 15 | 30 | 27 | 6 | 0 | 6 |
| Green needlegrass | 7 | 3 | 10 | 0 | 0 | 0 |
| Prairie junegrass | 2 | 7 | 0 | 0 | 0 | 0 |
| Threadleaf sedge | 2 | 1 | 10 | 1 | 0 | 2 |
| Buffalograss | 0 | 0 | 0 | 1 | 0 | 0 |
| Cheatgrass | 12 | 15 | 23 | 1 | 0 | 9 |
| Forbs | 9 | 13 | 5 | 2 | 3 | 0 |
| Bare ground | 2 | 3 | 0 | 2 | 27 | 2 |
| Litter | 37 | 4 | 6 | 62 | 41 | 24 |

The frequency of occurrence of bare ground and litter fluctuated greatly over the monitoring period (Tables 4 and 5). Again, this was probably related to the fluctuations in climate that would have influenced the tillering dynamics of the different species. If tiller recruitment of native species decreased during the dry years of 2002, 2004, and 2006 than it would follow that sampling procedures used to collect the frequency of occurrence data for each transect would have produced more hits of litter or bare ground. This was probably the case.

Table 5. Frequency of occurrence (%) of pasture species, bare ground, and litter recorded in late May in pasture 20 from 2000-2005 for the Faulstich MIG demonstration site near Highmore, South Dakota.

| | Year | | | | | |
|--------------------|------|------|------|------|------|------|
| Species | 2000 | 2001 | 2002 | 2003 | 2005 | 2006 |
| Kentucky bluegrass | 5 | 7 | 19 | 17 | 9 | 21 |
| Smooth brome | 9 | 0 | 5 | 7 | 5 | 11 |
| Western wheatgrass | 12 | 16 | 28 | 4 | 2 | 9 |
| Reed | 7 | 4 | 0 | 0 | 0 | 0 |
| Slew sedge | 6 | 21 | 6 | 0 | 0 | 0 |
| Crested wheatgrass | 0 | 0 | 0 | 5 | 0 | 0 |
| Threadleaf sedge | 15 | 4 | 21 | 1 | 0 | 3 |
| Cheatgrass | 0 | 0 | 5 | 0 | 0 | 2 |
| Forbs | 4 | 10 | 6 | 2 | 9 | 4 |
| Bare ground | 2 | 21 | 6 | 6 | 20 | 19 |
| Litter | 40 | 19 | 4 | 58 | 56 | 29 |

Water Quality and Runoff

When interpreting the surface water quality taken from the stock dam, we need to keep in mind that we can't separate out the difference between the grazing management and the climate. The stock

dam was fenced out so we can assume the water quality measurements would be a direct function of existing sediment and the fluctuations of surface water through additions by runoff and subtractions by evaporation. Annual precipitation was quite variable (Table 3) and would have affected the water depth and concentrations of various water quality parameters measured (Table 6).

According to water quality standards set by the 2002 South Dakota TMDL waterbody list (SD DENR 2002), much of the water quality parameters were at or below standards for Fish and wildlife propagation, recreation, and stock watering waters. Total solids in 2000 and 2001 were below standards but were above standards (2500 mg/L) in 2003. This was likely a result of the 2002 drought which caused the dry down of the dam and a concentration of solids. Of the suspended solids, the organic fraction represented 57% to 69% in 2001 and 2003. This suggests that microbes, algae, or animal wastes were main sources of suspended solids. No standard exists for total nitrogen; however levels have been categorized according to the trophic stage (Vollenweider, 1979). These stages are indicative of nutrient levels to cause growth of plants and algae. Total nitrogen in 2000 and 2003 were extremely high which would designate the stock dam as hypereutrophic. Although no standard exists for phosphorus, the trophic state index (TSI) can be calculated to determine the state of eutrophication. The TSI calculated using total phosphorus range from 1 to 100. Water bodies that range from 70 to 100 are reported as being “poor and do not support use”. The samples taken from the stock dam were extremely rich in phosphorus and would limit it as a fishery.

Table 6. Water quality analysis of samples collected from the stock dam during 2000-2003 for the Faulstich MIG demonstration site near Highmore, South Dakota.

| Item | Year | | |
|--------------------------------------|----------|----------|-----------|
| | 2000 | 2001 | 2003 |
| Date Collected | 8/7/2000 | 4/9/2001 | 7/28/2003 |
| pH | 9.35 | NA | 9.31 |
| Fecal Coliform- MF, units per 100 mL | <10 | <10/100 | <10 |
| Alkalinity- M, mg/mL | 266 | 32 | 243 |
| Alkalinity- P, mg/mL | 54 | 0 | 35 |
| Total Solids, mg/mL | 1334 | 204 | 3278 |
| Solids (suspended), mg/mL | 136 | 7 | 104 |
| VTSS (organic solids), mg/mL | NA | 4 | 72 |
| Ammonia, mg/mL | 0.04 | 0.23 | 0.09 |
| Nitrate, mg/mL | <0.1 | 0.7 | <0.1 |
| Total nitrogen, mg/mL | 14.8 | 0.78 | 11.8 |
| Phosphorus total, mg/mL | 0.924 | 0.314 | 1.42 |
| Phosphorus total dissolved, mg/mL | 0.148 | 0.271 | 0.202 |
| E. Coli, units per 100 mL | NA | 2/100 | 2 |
| TSI (total phosphorus) ¹ | 100 | 87 | 100 |

¹ TSI = 14.42 x Natural log[total phosphorus(micrograms/liter)] + 4.15

Runoff is difficult to measure and in this case we present anecdotal evidence that suggests runoff from well managed grasslands is low. Historically, dams and dugouts get recharged in years when

winter and early spring precipitation is high. Ranchers experienced significant draw downs on surface water in dugouts and dams across South Dakota during the widespread drought of 2002 and local droughts in 2004-2006.

Winter precipitation from 1999 through 2006 was below average (Table 7). Above average rainfall in spring of 2001 and 2003 helped to fill many stock dams in the area in addition to the winter and spring of 2006-07. However, the stock dam on the demonstration site had gone dry in 2002 and it wasn't until the winter and spring of 2006-07 that the water levels had filled the stock dam approximately 1/4th of the capacity.

Table 7. Winter and spring precipitation received at the Highmore Station from 1999-2007.

| Year | Winter | Spring | Total |
|---------------|--------------------------------|---------|-------|
| | Nov-Mar | Apr-May | |
| | ----- Precipitation (in) ----- | | |
| 1999-2000 | 1.22 | 4.73 | 5.95 |
| 2000-2001 | 2.82 | 6.57 | 9.39 |
| 2001-2002 | 2.16 | 2.04 | 4.20 |
| 2002-2003 | 1.52 | 5.76 | 7.28 |
| 2003-2004 | 2.48 | 4.77 | 7.25 |
| 2004-2005 | 0.83 | 4.15 | 4.98 |
| 2005-2006 | 0.83 | 2.17 | 3.00 |
| 2006-2007 | 3.66 | 6.87 | 10.53 |
| 30 yr average | 3.42 | 4.49 | 7.91 |

It is our opinion that the demonstration site probably had higher infiltration rates and less runoff due to moderate utilization (42%) and good litter cover (Tables 4 and 5) than surrounding pastures that have been historically season-long grazed at high stocking rates.

Sip Demonstration Site

In 2002, the second demonstration site was established by Mark Sip near Geddes, SD (Fig. 6). The pasture is made up of primarily silty ecological sites. The primary plant species include smooth brome grass, sedges, Kentucky bluegrass, and intermediate wheatgrass.

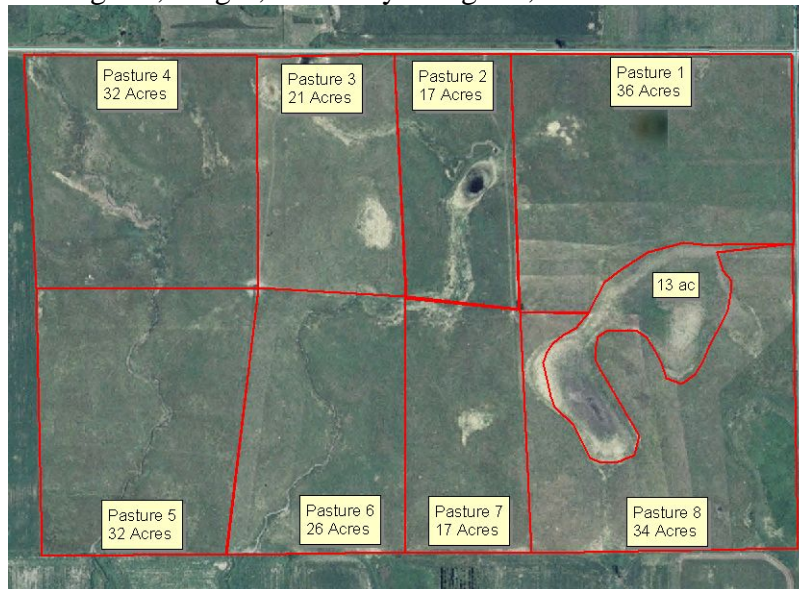


Figure 6. Pasture layout of Sip's managed-intensive grazing system on 231 acres in Charles Mix County.

Animal Performance

The pasture was stocked with Simmental/Angus cross steers during the summers of 2002 to 2006. Animal performance data during the first five years of the demonstration study are listed in Table 8. In 2002, the stocking rate was higher than desired for dry conditions because the producer was not able to destock at the appropriate time due to unfavorable cattle prices. The average number of grazing days supported by the MIG pasture was 91 days. Gain per animal and average daily gain (ADG) was quite consistent except in 2005 when steers were without water and feed for two days from the time after being removed from the pasture to the time they were sold at the sale barn. Gain per acre averaged 85.2 lb/acre over the five years and varied due to yearly stocking rate and ADG differences.

Table 8. Animal performance statistics for the Sip MIG demonstration site from 2002 to 2006 near Geddes, South Dakota.

| Item | Year | | | | |
|-------------------------|-------|------|------|------|------|
| | 2002 | 2003 | 2004 | 2005 | 2006 |
| Area grazed, acres | 231 | 231 | 231 | 215 | 215 |
| Stocking rate, AUM/acre | 2.23 | 1.72 | 1.74 | 1.39 | 1.51 |
| Grazing season, days | 137 | 76 | 96 | 71 | 73 |
| Number of steers | 140 | 146 | 154 | 160 | 167 |
| Initial weight, lb | 725 | 712 | 745 | 759 | 727 |
| Final weight, lb | 896 | 873 | 889 | 825 | 864 |
| Gain per animal, lb | 171 | 161 | 144 | 66 | 137 |
| Average daily gain, lb | 1.32 | 1.52 | 1.49 | 0.93 | 1.72 |
| Gain per acre, lb/acre | 109.6 | 73.0 | 94.7 | 49.1 | 99.6 |

Forage Biomass

Forage biomass estimated before cattle grazed each paddock averaged 2200 lb/acre, but varied considerably each year (Table 9). Forage biomass after cattle grazed each paddock was 1700 lb/acre resulting in an average utilization of 37%. The average number of days spent grazing each paddock was 3 days. Due to dry conditions, forage growth was less in 2002 and 2005.

Table 9. Average forage biomass before and after grazing, utilization, and average grazing days per paddock for the Sip MIG demonstration site from 2002 to 2006 near Geddes, South Dakota.

| Item | Year | | | | |
|--|------|------|------|------|------|
| | 2002 | 2003 | 2004 | 2005 | 2006 |
| Average forage biomass before grazing, lb/acre | 1400 | 3000 | 3400 | 1700 | 1900 |
| Average forage biomass after grazing, lb/acre | NA | 2200 | 1700 | 1100 | NA |
| Average utilization, % | NA | 23 | 49 | 40 | NA |
| Average time in paddock, days | 1.2 | 1.0 | 5.7 | 5.7 | NA |

Weather

Precipitation data for 2002 through 2006 and the historic 30 year average are shown in Table 10. Considerable variation existed in the monthly total precipitation each year. Drought conditions exhibited in the 2002, 2005, and 2006 forage biomass (Table 9) is in large part due to the amount of April + May precipitation (Table 10). The combination of April + May precipitation was important in determining the forage biomass.

Table 10. April through August, spring, summer, and season total precipitation from 2002 to 2006 and the 30 year average for the Sip MIG demonstration site near Geddes, South Dakota.

| Month | Year | | | | | |
|----------------------|-------|-------|-------|------|------|---------|
| | 2002 | 2003 | 2004 | 2005 | 2006 | Average |
| April | 1.39 | 3.00 | 0.91 | 0.95 | 2.50 | 2.61 |
| May | 0.72 | 2.80 | 5.27 | 2.65 | 0.25 | 3.80 |
| June | 2.47 | 2.80 | 3.47 | 4.50 | 1.50 | 3.41 |
| July | 0.55 | 2.60 | 1.40 | 0.20 | 0.27 | 3.16 |
| August | 4.92 | 2.15 | 1.70 | 0.20 | 3.34 | 2.47 |
| Spring (April-May) | 2.11 | 5.80 | 6.18 | 3.60 | 2.75 | 6.41 |
| Summer (June-August) | 7.94 | 7.55 | 6.57 | 4.90 | 5.11 | 9.04 |
| Season total | 10.05 | 13.35 | 12.75 | 8.50 | 7.86 | 15.45 |

Predictive Tools

Regression equations using monthly total precipitation to predict average forage biomass before grazing and stocking rate were evaluated. Spring precipitation (April + May) had the greatest ability to adequately predict forage biomass (Fig. 7). These results are different than the Faulstich site near Highmore which used just April precipitation. This information is still valuable since stocking rates can be adjusted by early June if needed to adjust to seasonal forage conditions.

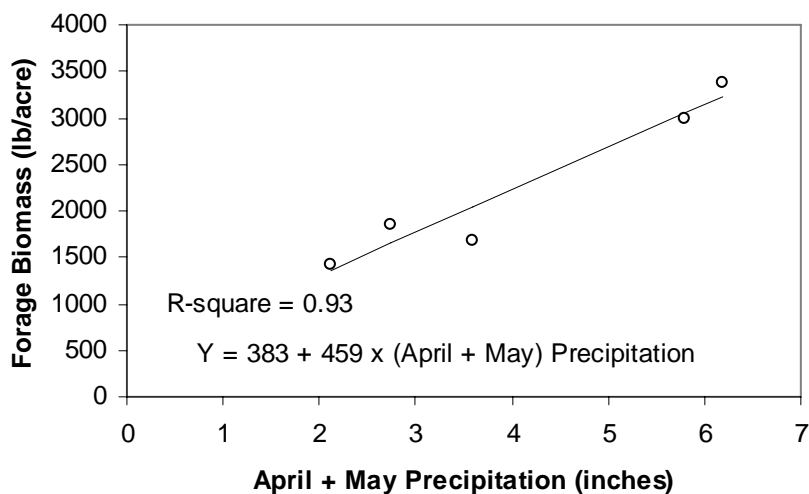


Figure 7. Relationship between average forage biomass before grazing and April + May total precipitation for the Sip MIG demonstration site near Geddes, South Dakota.

The severe drought of 2002 was excluded from the stocking rate analysis because as stated earlier, the producer was not able to destock according to the forage supply because of poor summer cattle prices. The relationship between spring moisture (April + May precipitation) and stocking rate was quite good from 2003 through 2006 (Fig. 8). Calculated stocking rate based NRCS protocol was much lower than the actual stocking rate (Fig. 8). This is hard to explain since the calculated stocking rate assumes a utilization rate of 50% and the measured utilization in this study averaged 37% (Table 9).

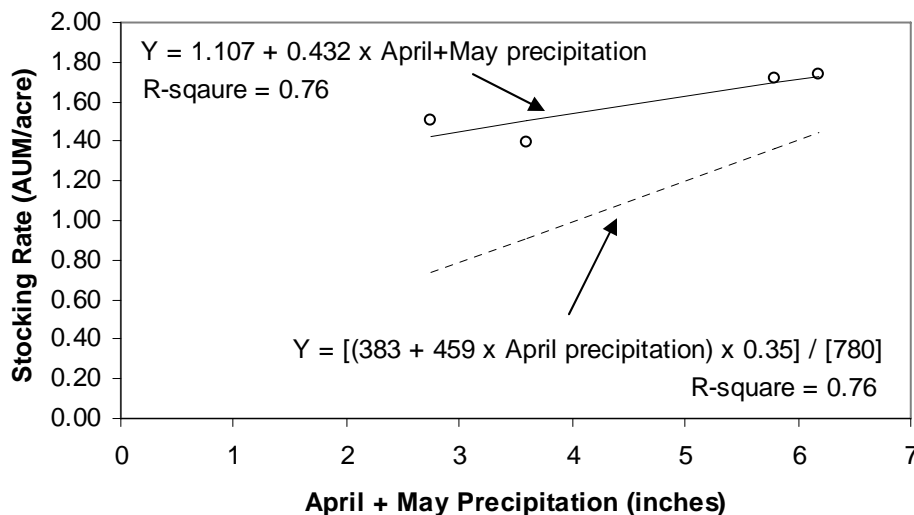


Figure 8. Relationship between actual stocking rate (open circles) and predicted stocking rate using April + May precipitation (solid line) and calculated stocking rate based on predicted forage production (dotted line) for the Sip MIG demonstration site near Geddes, South Dakota.

A couple of plausible reasons for this discrepancy could be 1) a low estimate of actual utilization and 2) the assumption of 780 lbs of air dry forage consumed (2.6% of body weight) by 1 AUM was too high. From grazing research, intake is related to animal demand and forage quality. Intake of 2.6% is very reasonable on pasture during the summer. So, I would be inclined to think that the forage utilization estimate may be low.

Predictive equations for beef production were not suitable to develop because of the overstocking in 2002 and the 2 day fasting weights when animals were sold in 2005.

Plant Community Monitoring

Monitoring transects were established in pastures 4 and 8 (see Fig. 6) following the same procedure as discussed in the Faulstich site. Since only 2 years of monitoring data have been collected, it is difficult to use this data to discuss any trends. From the data (Table 11), we see that the majority of the species were introduced cool-season grasses.

Table 11. Frequency of occurrence (%) of pasture species, bare ground, and litter recorded in late May in pastures 4 and 8 in 2003 and 2005 for the Sip MIG demonstration site near Geddes, South Dakota.

| | Pasture | | | | |
|-------------------------|-----------|------|--|-----------|------|
| | Pasture 4 | | | Pasture 8 | |
| Species | 2003 | 2005 | | 2003 | 2005 |
| Kentucky bluegrass | 28 | 31 | | 16 | 26 |
| Smooth brome | 8 | 0 | | 17 | 11 |
| Sedge | 2 | 0 | | 0 | 0 |
| Intermediate wheatgrass | 4 | 21 | | 0 | 1 |
| Black medic | 14 | 0 | | 6 | 12 |
| Annual forbs | 2 | 1 | | 2 | 1 |
| Crested wheatgrass | 0 | 0 | | 0 | 3 |
| Cheatgrass | 0 | 0 | | 0 | 2 |
| Other grass | 0 | 0 | | 3 | 0 |
| | | | | | |
| Bare ground | 3 | 7 | | 3 | 1 |
| Litter | 39 | 40 | | 53 | 43 |

In addition, the frequency of occurrence of black medic, an introduced annual legume, made a significant contribution to the total plant composition. Forbs made up very little of the species composition. Frequency of occurrence of litter was high and bare ground was low which indicated that adequate residual was left from the previous year. It is still too early to assess if long term prescribed grazing on this demonstration site will shift the plant community toward more native species.

This data (along with the Faulstich site) also suggests that a species such as Kentucky bluegrass is difficult to control if grazing pressure is not shifted toward April to allow more utilization of this plant. Otherwise, Kentucky bluegrass matures in early May and escapes heavy grazing pressure.

Water Quality and Runoff

When interpreting the surface water quality taken during runoff events from the creek we need to consider that a feedlot exists to the south of the demonstration site. During runoff events, water flows from south to north entering 2 creeks in pastures 5 and 6 and exiting pastures 3 and 4 (Fig. 6). Water samples were collected from these creeks in June of 2002 and 2007 (Table 12).

Table 12. Water quality analysis of samples collected from the creek in 2002 and 2007 for the Sip MIG demonstration site near Geddes, South Dakota.

| Item | Year | | | |
|--------------------------------------|-----------|-----------|-----------|-----------|
| | 2002 | 2002 | 2007 | 2007 |
| | Coming In | Going Out | Coming In | Going Out |
| Date Collected | 6/12/2002 | 6/12/2002 | 6/14/2007 | 6/14/2007 |
| Fecal Coliform- MF, units per 100 mL | 96000 | 24000 | 190000 | 210000 |
| Alkalinity- M, mg/L | 212 | 224 | 206 | 216 |
| Alkalinity- P, mg/L | 24 | 5 | 0 | 0 |
| Total Solids, mg/L | 3743 | 2973 | 1026 | 959 |
| Solids (suspended), mg/L | 1060 | 100 | 23 | 27 |
| VTSS (organic solids), mg/L | 200 | 64 | 2 | 10 |
| Ammonia, mg/L | 0.1 | 0.05 | 1.55 | 1.63 |
| Nitrate, mg/L | <0.1 | <0.1 | 3.9 | 0.6 |
| Total nitrogen, mg/L | 10.8 | 9.86 | 5.62 | 6.34 |
| Phosphorus total, mg/L | 4.10 | 3.20 | 4.24 | 4.54 |
| Phosphorus total dissolved, mg/L | 0.722 | 0.795 | 4.05 | 4.15 |
| E. Coli, units per 100 mL | 2420 | 2420 | 4840 | 4840 |

According to water quality standards set by the 2002 South Dakota TMDL waterbody list (SD DENR 2002), much of the water quality parameters were at or below standards for Fish and wildlife propagation, recreation, and stock watering waters. Fecal coliform bacteria and E. Coli counts were extremely high and likely were from the feedlot to the south. This suggests that even if landowners down stream practice good stewardship and upstream neighbors don't, agriculture will have difficulty in providing clean water to society. Total solids in 2002 were above standards (2500 mg/L). Of the suspended solids, the organic fraction represented 64% in 2002 and 37% in 2007. This suggests that microbes, algae, or animal wastes were significant sources of suspended solids. Total nitrogen and phosphorus in 2002 and 2007 were extremely high and would contribute toward excessive loadings in lakes or rivers.

Management Implications

The usefulness of this data can be seen in the predictive power of April and May precipitation on forage production, stocking rate, and beef gain per acre. Typical pasture turnout in eastern South Dakota is late-April or early-May. Therefore, decisions on stocking rate can be made early in the grazing season. If April and May precipitation is low and a low stocking rate is predicted, producers can use drought management decisions such as, early weaning and culling to reduce stocking rate. If April and May precipitation is high and a high stocking rate is predicted, producers can estimate the beef gain per acre early in the grazing season and decide if grazing yearling stocker cattle is profitable or not.

Fluctuations in spring and summer rainfall were powerful drivers influencing the vegetative composition. At the Faulstich site, drought caused a decrease in frequency of occurrence of native species and an increase in exotic cool-season grasses such as Kentucky bluegrass and smooth brome grass. These grasses are well adapted to avoid drought, but often poor producers during the summer. In order to reduce these species, heavy grazing pressure needs to be applied earlier in the growing season (April). This study supports that monitoring the species composition can be an effective component of a grazing system. Appropriate use of the MIG system combined with the knowledge gained from monitoring data, vegetative composition can be shifted toward a more desired plant community.

Fluctuations in winter and spring rainfall during this study resulted in changes in water quality and quantity. Fenced out stock dams that have accumulated sediment may be high in phosphorus and result in poor water quality (high TSI) for fish propagation. Droughts can cause draw downs in water quantity and result in higher total solids. We observed low recovery of water quantity at the Faulstich site during high winter and spring precipitation years compared to stock dams in continuous grazing systems around the region. We suspect that leaving more residual forage increased infiltration and reduced runoff. Therefore, using a MIG system at moderate stocking rates probably resulted in a more efficient water cycle. Reliable and flexible watering systems of a MIG system alleviate the need to use unreliable stock dams. Fencing out stock dams, allows producers an opportunity to create excellent wildlife habitat. Water quality of runoff at the Sip site in creeks was also affected by upstream dynamics. Good grazing management may do little to improve water quality if entering a site impaired. Thus all managers along a creek need to do their part toward contributing toward improved water quality.

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