

The North Dakota BeefLine Initiative

Authors - Kris Ringwall, Lee Manske, Karl Hoppe, Vern Anderson, John Dhuyvetter, Marty Marchello, Greg Lardy, Doug Landblom, Chip Poland, George Flaskerud, Paul Nyren, Tim Faller, Duane Hauck, Lisa Lee and Leif Anderson

Research Summary

Various segments of the beef cattle industry are presented here. These projects, if properly applied, can create additional options for economic enhancement. Each project targets a specific need for economic development while presenting producers with opportunities to control the destiny of the final quality sold to consumers. The outcome for producers is positive because this work gives the North Dakota's beef industry a competitive edge in the rapidly changing food industry. North Dakota beef producers will have access to information which will help them make production and management decisions which are consumer friendly. These decisions can directly translate to increased sales thereby resulting in value added income and economic development for the rural communities of the state. Information regarding improved efficiency, such as reduced winter feed costs will further equip North Dakota beef producers to make informed management decisions regarding beef production strategies. Improved efficiency will allow for greater production with static resources or similar production with less resources and result in improved profitability for North Dakota cattlemen. For example, reducing winter feed costs through strategic supplementation strategies will result in increased income for cow/calf producers. This data will also be used to develop 12-month pasture-forage strategies supporting the greatest sustainable, saleable production at the lowest cost per unit of production from a given land base, and thereby minimizing annual beef production costs. Producer education and marketing are key issues to equip cow calf producers with the knowledge to implement programs like Beef Quality Assurance and reap the economic rewards by forming alliances with others along the production chain to ensure management standards are consistent from conception to harvest. In conclusion, collaboration across the entire spectrum of beef research and extension are essential to this project. It involves livestock producers, feed producers, feed lot operators, financing organizations, veterinarians, agricultural service professionals, economic development specialists and NDSU personnel. This gathering at the development table will be used to identify short and long range needs and the mechanisms necessary to meet the future of the beef industry in North Dakota.

Introduction

A recent turn around in beef cattle values has moved the beef cattle industry into the forefront of production agriculture and sustainable, profitable beef systems need to be developed. This project will develop options for beef producers from conception through harvest and assistance beef producers with management strategies which would optimize resources available and maximize economic returns.

Material and Methods

Three main areas of concern comprise the BeefLine Initiative, a program designed to provide assistance to all segments of the North Dakota beef industry. The program includes resource management (land, air, and water), production management strategies and marketing education and strategy. Example specific research and extension projects currently included are: Year long Pasture and Forage Management Systems, Adopting Performance Records through CHAPS, Bedding and the Environment, Beef Quality Assurance, Calves to Carcass Demonstration Project, Capturing Value of Flax and Barley Diets in Animal Performance and Health Aspects of Beef, Conservation Reserve Hay Laboratory Analysis Project, Co-products as an Alternative Creep Feed, Feedlot Usage of Straw Bedding, Field Peas in Receiving Diets for Beef Calves, Fly Ash for Stabilizing Feedlot Surfaces, Forage Quality and Supplementation, Hay Feeding Methods and Wintering Costs, High Quality Forage Demonstrations, Implant Effectiveness in Beef Calves, Livestock Education and Marketing Clubs, Mineral Supplementation, Nutrition Value of Forage Oats and Barley, Ration Formulation Helped by Feed Testing, Resource-Based Cow/Calf Production Systems, SmartCows System Management Strategy, Southwest Feeders, Soyhulls vs. Corn: Energy Source in Lactating Beef Cows, Sunflower Screenings, Barley Malt, or Wheat Midds in Lactating Beef Cow Diets, Water Quality for Cattle and Waste Management. The overall goals are to lower the unit cost of production for North Dakota beef calves and increase value and enhance wholesomeness of North Dakota beef.

Results and Discussion

Malt Barley production research

Thirteen counties in southwest North Dakota raised barley on 280,000 acres in 2001. The region's climate is less suited to disease development allowing for greater potential in malt barley production. Research through the barley initiative reveals that producers may have a positive economic outcome without changes in equipment if barley varieties and management practices are developed for western North Dakota and adopted by producers. The DREC has evaluated barley breeding lines that demonstrate improved plumpness and lower protein which is preferred for malting.

Impact: What if producers had a conservative yield of 45 bushels per acre on 280,000 acres and received 50 cents per bushel premium. This would mean producers would generate \$6.5 million increase in revenue just in southwest North Dakota. (Good malting barley premiums are between \$0.70 to \$1.25 per bushel.)

Organic cultivar selection

DREC scientists initiated SBARE, SARE, and Organic Farming Research Foundation supported research to identify modern wheat, barley, and oat varieties that are adapted to organic environments. This research has received recognition from the organic community in the United States and Canada.

Impact: What if the international organic food production business sustains a conservative 10 per cent growth; consider the positive impact of improved varieties on the economies of the United States, Canada and other countries. There is also the discussion that these impacts could have on improving food production and the quality of life for under developed nations.

Integrated forage/livestock systems

DREC scientists are integrating crop and livestock systems in CSREES- and NCR-SARE funded research that has been acknowledged in an article published in the *Agronomy Journal*. The systems will offer alternatives to traditional wheat-fallow and seed/grain systems.

Additionally, DREC scientists have completed research demonstrating that barley is superior to oat in forage quality and that barley should be considered an alternative forage to the more popular oat when small grains are grown.

Impact: Maximizing nutrient harvest in the native, tame and seeded forages by animals or mechanical harvesters results in increased gain per animal, higher stocking rates and income.

Rotations and root disease in wheat

The DREC has played a lead role in demonstrating how soil-borne root pathogens on continuous wheat and barley can reduce yields by 40%. In western North Dakota in 1997 75% of the wheat grown had been in fields where wheat or barley was grown the previous year.

Impact: Consider the year 2000: 2,073,000 acres of wheat were seeded in southwest North Dakota with an average yield of 31.5 bushels per acre. What if we could eliminate a 40 percent loss with proper rotations? The net result is an increase in production of approximately 30,000,000 bushels of wheat. What does an additional 30,000,000 bushels of wheat at \$3.00 per bushel mean to the North Dakota Economy?

Seed treatment to control soil-borne pathogens in wheat

Demonstrate how fungicide seed treatments can improve wheat yields by two to four bushels per acre.

Impact: Consider the year 2000: 2,073,000 acres of wheat in southwest North Dakota. Only half of the wheat seed that is planted is treated. If the other half of the wheat that is seeded is treated with effective fungicides that could have a direct impact of increasing 2,073,000 to 4,146,000 bushels of wheat per year. That could mean between \$6 - \$12 million for North Dakota producers and the North Dakota economy.

Twelve-Month Pasture-Forage Management Systems

Wealth generated from agricultural use of land managed by traditional practices can be increased 4.3 times through implementation of efficient pasture and forage systems. These systems beneficially manipulate plant and ecosystem processes, improve the efficiency of nutrient capture from the plants, and improve the efficiency of conversion of nutrients into a saleable product.

The pasture and forage costs per range cow and calf can be reduced from \$330.00 per year (or \$0.90 per day) on traditional 6.0-month season long management to \$171.00 per year (or \$0.47 per day) on efficient 12-month pasture-forage management systems. The pasture and forage cost per pound of calf weight gain can be reduced from \$0.61 per pound on traditional management to \$0.28 per pound on efficient management systems.

Impact: By using an efficient 12-month pasture-forage management system, beef producers with 300 cows can reduce their pasture and forage costs by 48% per year and increased net income three to 10 times on their current land resources.

Southwest Feeders

A cooperative effort between the Dickinson and Hettinger R&E Centers converts existing agricultural resources (e.g. high quality livestock, excess feeds, facilities, seasonal labor) into additional economic activity and adding value to beef and sheep production. Opportunities exist to combine this effort into a regional effort (VARAC, Value-Added Ruminant Animal Consortium) focused on stimulating agricultural economic development with ruminant animals (e.g. cattle, sheep, bison).

Impact: What if \$140 per calf in SWND and \$28 per lamb statewide could be generated, the net result would be nearly \$25 million in added economic activity for the region.

Management/Genetics Increase Returns

The Dickinson Research Extension Center has conducted research in management and genetic research to determine how each protocol can affect profitability. A five-year average of premiums paid shows that the ability to increase the value of a calf seems very real under proper management. Superior genetics showed an increase in net return in sire value based on performance of progeny.

Impact: What if all of the nearly one million calves born in 2002 were able to get the \$51.07 extra in net return? The result would be over \$50 million in income to North Dakota beef producers.

Early foliar applications of fungicide on HRSW

Demonstrate how use of foliar fungicides in continuous wheat rotations can control tan spot disease, resulting in a yield increase of 4.5 to 6.9 bushels per acre. In 1997, wheat was seeded on to small grain stubble 75% of the time.

Impact: 2,073,000 acres of wheat in southwest North Dakota. The direct impact is 7 – 11 million bushels of wheat per year. That could mean \$21 to \$36 million for North Dakota producers and the North Dakota economy.

Salt-limited pea/wheat midd creep diet

The feeding of pea/wheat midds in creep diets resulted in data that suggested two-thirds pea and

one-third wheat midds was optimum for weight gain and regulation of creep intake using salt could effectively deliver nutrients without over consumption.

Impact: Economic analysis revealed that for every dollar invested in creep feed, a dollar over input costs was realized. What if the nearly 1 million calves were fed a pea/wheat midds diet? The reality could be a substantial economic return that would exceed \$25 million.

Tillage systems research

This included research on no-till, reduced-till and conventional-till. relative to seeding rates in the three management regimens.

DREC scientists demonstrated that variety selection under conventional tillage can be applied to reduced-and no-till systems in western North Dakota, and that seeding rates established under conventional tillage also can be applied to reduced- and no-till systems in a wheat-fallow monoculture.

Impact: What if seed costs were reduced by a little as 20 per cent on all no-till and reduced till acres, the direct impact could exceed millions of dollars annually. Additionally, data suggests that plot trials for further seeding rate research about conventional till and no-till is unnecessary.

Xeriscape Landscaping

Xeric techniques are being demonstrated and evaluated as part of the DREC horticulture research program. The xeric outdoor laboratory is being utilized by the general public, agencies, organizations and industry representatives as a resource to obtain new landscape ideas.

Adoption of xeriscape landscape practices is readily expanding in Dickinson and surrounding areas. The most popular trend is to reduce the amount of Kentucky bluegrass turf and incorporate diverse plantings of xeric plants. The use of organic mulches has increased to the point that local availability is a concern.

Impact: Because water is a limiting resource in southwest North Dakota, xeriscape landscaping can maintain the beauty of home landscape and save homeowners' money. What if this data was used to provide additional landscaping opportunities for the community and homeowners?

DREC continuing education

A key part of any research program is sharing the knowledge. All Dickinson Research Extension Center researchers are given equal opportunities to have research as part of the DREC website, which is maintained by a staff person.

Access to the website is free to anyone seeking information on the activities at the DREC. Information can be downloaded and shared with fellow producers and/or used in an individual enterprise.

Impact: The latest information on grain varieties, fertilizer application, cropping systems (all items discussed in this information piece) is available at the website. It is continuing education in a producer's home and/or office. The website address is as follows: (<http://www.ag.ndsu.nodak.edu/dickinso/>)

Documented new paradigms, using corn as a winter feed

DREC research has shown that cow body condition for good health and preparation for post calving breeding can be maintained using standing corn as the winter feed ration. Costs are very competitive and provide alternative use for land mass while potentially decreasing mechanical labor costs for harvesting, reducing potential environmental issues, enhancing soil productivity and enhancing wildlife feed and habitat.

Impact: What if body condition score and pounds gained exceeded the traditional management practices used while lowering per day costs.

Winter grazing

Non-lactating beef cows have been successfully grazed in winter pastures for the past five years at the Dickinson Research Extension Center. This grazing, coupled with an appropriate supplementation program, can be used to extend the grazing season and reduce reliance on harvested feed from late fall until early winter in southwestern ND.

Impact: Narrow profit margins force producers to explore ways to improve profit potentials. Supplemented winter grazing programs offer one possible approach to improving the profit potential of livestock operations in southwestern ND.

Integrating crop and livestock systems

The introduction of alternative forage crops provides viable cash crop alternatives to traditional grain production. Millet, alfalfa and sweet clover were grown as monocultures or intercrops to compare

grazing, haying or grain (where applicable) harvesting options.

Impact: At current market prices, a hay harvesting option seems to be the most optimistic alternative. Profit potential from annual forage production exceeds current expectations from traditional grain production. A hay harvest option using current market prices is a more viable alternative compared to a cattle grazing harvest option.

Wheat-pea rotation

DREC scientists have demonstrated that rotating wheat and peas can be done successfully and should be considered as an alternative to continuous wheat and other cropping systems in western North Dakota. Wheat yield and quality is enhanced routinely following peas, compared with a continuous wheat system.

Impact: What if wheat yields were increased by 10 per cent and protein produced was two per cent higher? The impact could exceed \$8.5 million, not to mention increased soil health and potential productivity for future years.

Plant Diagnostic Clinic

Equipment necessary to identify plant diseases and insects and either provide the correct information for treating a crop or eliminating unnecessary treatment of grain is a tremendous management tool for producers in the region. This equipment is available through the NDSU Extension Service and the Dickinson Research Extension Center. This equipment could potentially recognize symptoms of disease and give producers the jump on treatment protocols that are necessary.

Impact: This equipment was used in identifying insects in grain. The insect found was transitory and not problematic thus saving the application of a fumigant. Wheat streak mosaic is spread by mites. Mites were identified in large numbers in some fields in southwest North Dakota. Producers took action and delayed seeding winter wheat to break the green bridge between crops. The economic impact would reach well into the millions of dollars.

Waste management control

The outwintering facility on Section 19 at the Dickinson Research Extension Center Ranch has provided an opportunity to evaluate feeding regimens, maintain cattle on non riparian areas, and reduce concentrations of waste. (Statistics show a gestating beef cow can produce up to five ton of waste during the wintering period.) The net result is placement of fertility back on the ground where it belongs without

the potentially dangerous concentrations of nitrogen and phosphorous that occurs in normal feedlot situations.

Impact: Minimize mechanical handling of manure is itself a direct savings to an operation. The positive effects of natural fertilization and the elimination of potential harmful concentrations can create positive scenarios for a harmonious environment, all which will have a positive impact on water quality. This facility may become a model for low cost solutions for water quality enhancement.

BeefTalk column provides management concepts

The BeefTalk column was initiated in the second quarter of 2000. It chronicles the events and activities of the beef industry, discussing management options, philosophy of the beef business and providing data about how North Dakota producers are doing in comparison with each other and beef producers nationally.

The column, distributed electronically through NDSU Agricultural Communications, is available on the internet (www.BeefTalk.com) at no charge.

Over 60,000 visits have been recorded since it became available electronically, an average of over 150 per day.

Impact: The infrastructure for continuing education is expensive and at times lethargic when it comes to providing up to date information to business (in this case agricultural producers). Image the use of key data and trends that could improve economic conditions in agriculture and our rural communities.

Sunflower planting date study in SWND

Determine the optimum planting date of NuSun sunflower, a mid-oleic line of sunflower developed to compete with high quality consumer cooking oils.

Impact: What if yields as the data suggests were increased by 15% by selecting the proper planting date? What if oleic fatty acid content was improved by 35% by selecting the proper planting date?