

1999 Project Abstract

For the Period Ending June 30, 2001

FINAL REPORT

TITLE: Sustainable Livestock Systems (7(p))

PROJECT MANAGER: Dennis Johnson

ORGANIZATION: West Central Research and Outreach Center

ADDRESS: State Hwy. 329, P.O. Box 471, Morris, MN 56267

WEB SITE ADDRESS: dairydgj@mrs.umn.edu

FUND: Minnesota Future Resources Fund

LEGAL CITATION: ML 1999, Ch. 231, Sec. 16, Subd. 7 Agriculture and Natural Resource Based Ind Language: (p) Sustainable Livestock Systems. \$350,000 is from the future resources fund to the commissioner of agriculture for an agreement with the University of Minnesota, West Central Experiment Station for on-farm research and education programs to support small- to moderate-scale farms through whole farm planning and monitoring of forage-based livestock systems.

APPROPRIATION AMOUNT: \$350,000

This project provided farmers with working partners as they developed whole farm plans, provided research for specific grazing issues where there is a dearth of information, and brought new information to other farmers and the public through field days and other educational activities

A group of farmers from the Montevideo area were organized as the Chippewa River Whole Farming and Monitoring Team. Together with agricultural and natural resource professionals they would meet to develop goals and plans for their farming operations. Over the two years of the project their self organized goals moved from the routine issues of farm operation to higher order goals of increasing their ability to add value to their livestock products through building direct marketing links with consumers. A second set of farmers set the agenda for research conducted on their farms and at the West Central Research and Outreach Center addressing sustainable livestock production. Key outcomes include establishing that dairy heifers pastured can gain at equal rates to heifers in a feed lot at lower costs, heifers will grow normally grazing green corn from September through November when pasture supplies are low, lactating dairy cows can be housed without a barn during winter if protected from wind and provided a dry pack, stocker steers on pasture benefit from being fed relatively small amounts of supplemental grain. This project reoriented the goals of sheep and dairy research toward sustainable systems, which continued beyond this project.

Five public workshops were provided during the time of the project. Another workshop teaching farmers how to develop and manage a grazing system was adapted for presentation as a internet based activity. One of the farmer partners is featured as a case study for learning how to manage a grazing system in a video.

July 1, 2001
LCMR Final Work Program Report

FINAL REPORT

I. PROJECT TITLE: Sustainable Livestock Systems (7(p))

Project Manager: Dennis Johnson

Affiliation: West Central Research and Outreach Center, U of MN

Address: Box 471, Morris, MN 56267

Telephone: 320.589.1711

Email: dairydgj@mrs.umn.edu

Total Biennial Project Budget:

\$ LCMR:	\$350,000.00	\$ Match:	\$ 0
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\$LCMR Amount Spent:	\$346,673.74	\$ Match Amount Spent:	\$ 0
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\$LCMR Balance:	\$3326.26	\$Match Balance	\$ 0
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Legal Citation: ML 99, Chap. 231 Sec. 16, Subd. 007p Agriculture and Natural Resource Based Ind Language: (p) Sustainable Livestock Systems. \$350,000 is from the future resources fund to the commissioner of agriculture for an agreement with the University of Minnesota, West Central Experiment Station for on-farm research and education programs to support small- to moderate-scale farms through whole farm planning and monitoring of forage-based livestock systems.

B. Status of Match Requirement: None required.

II and III: Final Project Summary

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A second set of farmers set the agenda for research conducted on their farms and at the West Central Research and Outreach Center addressing sustainable livestock production. Key outcomes include establishing that dairy heifers pastured can gain at equal rates to heifers in a feed lot at lower costs, heifers will grow normally grazing green corn from September through November when pasture supplies are low, lactating dairy cows can be housed without a barn during winter if protected from wind and provided a dry pack, and

stocker steers on pasture benefit from being fed relatively small amounts of supplemental grain. This project reoriented the goals of sheep and dairy research toward sustainable systems, which continues beyond this project.

Five public workshops and four field days were provided during the time of the project. Another workshop teaching farmers how to develop and manage a grazing system was adapted for presentation as an Internet based activity. One of the farmer partners is featured as a case study for learning how to manage a grazing system in a video.

IV. OUTLINE OF PROJECT RESULTS:

Result I. Expanding the scope of the Chippewa River Whole Farm Planning and Monitoring team to include farms with livestock systems

LCMR Budget	\$50,000	Match Not required
Balance	\$0	
	Match Balance \$0	

Description:

Whole Farm Planning includes setting goals and developing action strategies for the quality of life and the financial well being of the farm family and the health of the ecosystem process (energy, water and nutrient cycles, and biological diversity) on the farm. This result expands the scope of the Chippewa River Team to include Whole Farm Planning and Monitoring of Sustainable Livestock Systems. Through the work of the Chippewa River Whole Farm Planning and Monitoring Team all participants in the Sustainable Livestock Systems project will receive support and assistance to develop and implement (a) Whole Farm Plans and, (b) systems for monitoring their livestock management strategies. Whole farm Planning will be accomplished through group meetings, meeting with the team and one on one on site planning and problem solving sessions. This work will be the responsibility of the staff of the western office of the Land Stewardship Project and will be accomplished through a variety of means:

Result IA. Team sponsored forums, meetings and workshops on topics central to the process of whole farm planning will be held. Specific topics will be selected by the Team participants but will include goal setting, financial planning and monitoring, managing nutrients, monitoring animal health on pastures, livestock opportunities for beginning farmers.

Result IB. The scope of the Team's quarterly newsletter, The Chippewa Current, will be expanded to include planning and monitoring sustainable livestock systems. Distribution will be expanded to include this project's participants. This newsletter will include information on water quality issues and nutrient management in the region, training opportunities, as well as information on whole farm planning processes, monitoring and marketing.

Result IC. One on one and small group planning sessions will be held as needed to provide all participants with the information and support they need to develop whole farm plans and monitoring strategies.

Application of Result 1

The Chippewa River Team evolved in unexpected directions. Over about the first 2/3 of the project duration the group met almost every month to gain new background information that they intended to use in writing whole form plans for each farm. To prepare for the planning the monthly meeting would include a sharing of experiences relating specifically to monitoring the state of their farm, followed by a content presentation (budgeting, animal care, pasture management, soil fertility, grant preparation, etc.) and exercises in preparing goals. In spite of continued encouragement and farm visits to assist with goal setting, only three or four farmers completed a whole farm planning routine. As time went along the participants focused more and more on identifying ways that they might add value to the products they produced on their farms. Two of the farmers attended a workshop on the impact of diet on the healthfulness of beef and developed a very strong interest in taking Team meetings in that direction. Ultimately the team presented a workshop on food marketing that was presented by food systems professional. We have observed a strong interest in this topic across the agricultural community. The meetings illustrated some characteristics from chaos theory as applied to human groups. At times when a mature concept is ready for a mode change a “window of opportunity” opens when new ideas flow rapidly with little order.

Result 2: Research Targeted to Small/Moderate-Sized Livestock Farms.

LCMR Budget	\$280,350.00	Match Not required
Balance	\$2283.44	Match Balance \$0

Description

A panel of farmers selected Financial Benchmarking, livestock in cropping systems, and wintering of livestock as the highest priority research areas. This result will build the capacity of farmers to conduct reliable research on their own farm. A minimum of 8 livestock farms with whole-farm goals will be the sites for evaluation of pasture/forage diversity, quality and production; soil and water quality and conservation; animal health, growth, lactation and genetics; farm profitability; and farm family quality of life. Farmers and researchers will jointly determine monitoring tools that require intensive research verification. Data will be collected and analyzed by farmers and researchers. The farmer/researcher team will plan and implement intensive grazing management experiments to develop new farmer-friendly livestock monitoring tools. Research will be conducted at the West Central Research and Outreach Center and on farms. This result will be coordinated by West Central Research and Outreach Center and participating farmers.

Application: The sustainable livestock systems project was designed to be farmer driven with research determined and to a large extent carried out by farmers on their farms.

Before the work plan was determined farmers were recruited to attend a meeting to gather their ideas for research, prioritize the research ideas, and find ways to follow-up in support of those ideas. The meeting concluded with the selection of financial benchmarking, extending the grazing system into the autumn, improving pasture quality, and wintering animals with minimal housing selected as top priority issues by the farmers. Farmers were asked to participate and collect data on their farms, with the more intensive projects carried out at the research center. Researchers had not expected the farmers to choose the array of topics that were chosen by the farmers, and the farmers did not initially appreciate the challenges and discipline that goes with research. Subsequent training that was undertaken after the completion of this project suggests that systems research methods, including modeling would have been a useful adjunct. Specific discussion of application is provided with each sub-result.

Result 2A. Benchmarking

In order to assess whether a production system is economically viable a number of indicators will be developed. These financial benchmarks provide a standard for comparisons between systems as well as comparisons for producers using similar systems. In order to make comparisons of relative economic performance between sustainable livestock systems and more traditional livestock production systems, benchmarking must occur.

Because there are not a sufficient number of farms within the Sustainable Livestock Systems project to properly benchmark financial and production indicators, much of the financial information will need to be obtained from larger databases available from the Farm Management Associations throughout the state.

Application of benchmarking Farm accounts records were kept by many of the farmers that participated in the project. Thus data was provided during the regular cycle of financial data collection oriented to the tax season. An additional set of parameters was identified for some farms that were prepared for additional monitoring of animal production inputs associated with the practices chosen for evaluation. While this project did not follow the same time cycle as the financial record file the farmer participants volunteered to provide their data in the spring of 2002 so 2 full years of data will be available for evaluation. Other funding is paying the cost of evaluating post-project data. Dr. Rudstrom is now participating in a project involving states from Minnesota to Maine where data is being pooled so conclusions can be drawn about the potential profitability of grazing systems in temperate zones.

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Result 2B.: Livestock in Cropping Systems

Description

Goals for this portion of the project are 1) to extend Minnesota's current 150 day grazing season to 210 days and 2) to improve the uniformity of forage availability throughout the growing season. Research focusing on management systems that will extend the grazing season and provide forage during deficit periods will be conducted both on farm and at the WCROC. Forage production, utilization and quality will be evaluated.

Specific projects on farms will be determined by farmers and researchers when the work plan is approved. Potential research projects that have been discussed in preliminary meetings include: grazing crop residues, use of *Brasilia* species in fall, grazing corn, grazing alfalfa fall regrowth, use of stockpiled forages, and use of summer planted small grains for fall forage. Producers will choose from among grazing alfalfa, pearl millet, sorghum species, annual ryegrass, cowpeas, indeterminate soybeans, for use on their farm. Research at the center will also be selected by farmers, but will be more intensive and collect more comprehensive data.

Application of forage systems:

Alfalfa management:

FARM COOPERATOR AND LOCATION FOR THE STUDY: The Roger Imdieke Farm near Elrosa,

PURPOSE: Compare the performance and economics of developing dairy heifers in an alfalfa grazing system to a traditional feedlot and cropping system.

STUDY DURATION: May 10, 2001-2 through October 2, 2001-2 and is subject to change due to weather conditions. This will be the second year of the trial.

ANIMALS: 140 dairy heifers weighing approximately 470 lbs in 2 treatments and 2 replications.

TREATMENTS: Beginning May 3, 2001 heifers will be weighed at the Roger Imdieke Farm. The heifers will be allotted by weight to 2 treatments. The treatments will be: 1) Feedlot with TMR. 2) Graze Alfalfa with Supplement.

DATA COLLECTION: WCROC personnel will be responsible for all data collection. Heifers will be weighed at day 1 and at 28-day intervals (every fourth Thursday) through the trial duration. Full weights will be used throughout the study. At the beginning of the trial, three 2 x 1 ft square areas will be clipped from each of the alfalfa grazing pastures (6 samples). One intake sample will also be collected in each alfalfa grazing pastures (2 samples per farm). At 14-day intervals, three 2 x 1 ft square areas will be clipped from the most recent post-grazing alfalfa paddocks and the next pre-grazing alfalfa paddocks (12 samples). In addition, one sample will be clipped from the tops of the alfalfa in the pre-grazed alfalfa paddocks (2 samples). The samples will be used to determine forage yield, quality and estimated intake quality. One sample will also be taken from the TMR at the beginning of the trial, end of the trial, and at 28-day intervals. Individual ingredient (corn, corn silage, hay, soybean meal, minerals, or any other ingredients) samples will be taken at the beginning, end, and 28-day intervals. Roger Imdieke will monitor time, expenses, and receipts for the heifers in this trial. To be continued with an MDA grant.

Roger is a professional dairy heifer grower. He lives in New London while the heifer operation is conducted on the home farm of his parents, Mr. and Mrs. Bob Imdieke. His children help seasonally and he has 5 associates that grow some of the heifers on their own farms. The farm has heavy soil and is located near wetlands and a lake.

Roger first became interested in this approach to raising heifers after hearing presentations on Whole Farm Planning and grazing systems in 1997. His operation had been conducted with feedlot management, but he started to wonder in grazing might be both pleasant and

cost efficient. He attended a grazing workshop at WCROC and provided input to the design of a farmer-driven research project that kicked off this project. He wants to learn if soils that grow large yields of corn and soybean can be profitably converted to heifer grazing.

This project is part of a three year replicated study where growing heifers are grown in feed lot and are fed a total mixed ration (TMR) or are grazed on an alfalfa pasture. The growth of the heifers and the economics of the systems are compared. A total of 258 heifers have been utilized in the first two years of the demonstration.

All of the feed, labor and other inputs are recorded so that accurate and statistically valid comparisons can be made between the systems. In all, the experiment will be repeated three years.

In 2000 and 2001 the daily gains have been consistently at 2 lb/ hd per day in the feedlot or on pasture. However, there have been important differences in cost. The average total cost/hd/day in the pasture averaged \$1.07 vs. \$1.22 in the feedlot system. The main difference is in feed cost, \$.31 in pasture compared to \$.74 in the feedlot. There was almost no difference in labor requirement, only a total of about 10 minutes per day for either system. Cost per lb of gain was below \$.60 for both systems.

A crucial question is: "Can I afford to graze animals on land where I could grow corn or soybeans?" Return per acre for grazing was \$146.55 in 2000 and \$36.24 in 2001, which reflects lower forage production in the second year. Comparisons are highly sensitive to yields and prices, which are very volatile.

This study over two years has conclusively shown that heifers on pasture and heifers in feedlots with concentrated diets can both gain approximately 2.00 lb per day with a 20-40% reduction in costs when pasture is used. This is critical information that can have millions of dollars of impact in Minnesota dairy herds. The estimated saving of at about \$.20/day for 140 days in a summer could save \$56 for every heifer raised in Minnesota.

FARM COOPERATOR AND LOCATION FOR THE STUDY:

The Don Struxness Farm, Milan, MN.

PURPOSE: Investigate alfalfa grazing production systems for beef stocker cattle and determine cattle performance from these systems.

STUDY DURATION: May 15th, 2001 through September 4, 2001 and will be subject to change due to weather conditions. This will be the second year of the trial.

ANIMALS: 80 beef steers weighing approximately 700 lbs in 4 treatments and 2 replications.

TREATMENTS: Beginning May 15th, 2001 steers will be weighed at the Don Struxness Farm. The steers will be allotted by weight to 4 treatments. The treatments are 1) Graze Alfalfa. 2) Graze Alfalfa, Moderate Potency Implant. 3) Graze Alfalfa, No Implant, and Cracked Corn Supplement. 4) Graze Alfalfa, Moderate Potency Implant, and Cracked Corn Supplement.

The protocol was slightly modified for 1961. To be continued with an MDA grant.

Don and Bev concentrate on growing beef on their farm near Milan in western Minnesota. They have a preference for producing beef primarily from forage as that meets their goals of safeguarding the land, and producing a healthful high-quality meat product at a profit. Their question was whether or not they would benefit from utilizing a moderate potency growth promoting implant with grazing stocker steers and/or provide an average of 5 lb cracked corn per day as a supplement to help assure meeting a growth goal of 2.5 lb/hd/day. Growth across the grazing season has been evaluated, but all cost figures are not yet available. I regret a more complete data set isn't available yet.

All the stockers were grazed on high quality alfalfa pasture starting from mid-June to mid-September. Pasture alone provided 2.02 lb of gain/hd/day. Steers fed cracked corn with or without an implant met the goals for growth. The implant without a supplement improved rate of gain about .28 lb/hd/day.

Studies at WCROC have shown that dairy heifers will grow normally if grazed on standing corn from September to November, and pregnant heifers grazed the summer before they initiate lactation have fewer health problems than heifers raised in feedlots.

Result 2C. Wintering of Livestock.

This result will investigate ways of dramatically reducing the cost of winter housing by reduced use of barn and optimal use of outdoor housing. Traditional wintering in the upper Midwest typically consists of housing animals. This system consists of bedding on straw then having to remove this soiled bedding and apply it to crop production areas. Areas that will be investigated include 1) animal health, 2) winter feeding programs based on wintering system, 3) winter bedding (i.e. manure pack, wintering in tree breaks, wintering in open) and 4) impacts of wintering system on the subsequent years production.

On-farm and Experiment Station animal health will be monitored by close observation, body weight gain or loss, body condition scores and by collecting and analyzing blood samples throughout the wintering period to establish health status. All feeds and feed stuffs will be analyzed for nutrient content so that appropriate diets may be formulated to meet animal needs based on environmental and wintering system conditions. Soil and water samples will be monitored and analyzed in an attempt to quantify environmental impacts of differing wintering systems. Subsequent years production of wintering site will be monitored by soil, water, and forage sampling to determine impacts of wintering on pastures. Number of research locations, treatments, plots, etc. will be determined by the facilities and management systems of participating farmers. Intense measurements (blood, feedstuffs, etc. will be collected from research at the WCROC.

Application of outdoor wintering:

Winter housing in the outdoors is a controversial topic, so data collection funded from other sources is continuing with WCROC dairy and sheep stock.

The most significant impact at this point is a reorientation of the WCROC dairy research program to a low cost systems evaluation as described:

Background: The dairy industry in Minnesota continues to evolve with a drastic reduction of moderate-sized, conventionally managed dairy farms that have been the backbone of dairying. Many of the farms that do remain are at a critical point where facilities need renovation or replacement that does not appear to be economic. Confronted with an apparent choice to “get big or get out”, many get out; leaving dislocated people, diminished rural communities, and Minnesota with a declining position in the national dairy sector. Moderate sized dairy farmers want and need to know if there are viable alternatives to getting out or the alternative of assuming the capitalization and management challenges of an expanded enterprise.

WCROC Dairy Program in 2001: The goal of the dairy program at WCROC has been to serve the information needs of moderate sized dairy farms, with a focus on the role of grazing in sustainable systems and evaluation of forages for lactating dairy cows. After several years of transition, the program is now positioned to focus intensively on key issues relating to the grazing dairy enterprise. Adoption of this proposal will have impact on other programs at WCROC and COAFES and will require extensive consultation before it is adopted.

Objective: To conduct a 5-year study comparing conventional dairy management with a reduced investment dairy production system focused on spring calving dairy production, intensive grazing for feed, cross-bred genetics for hardy cattle, outdoor bedded pack for housing, and Midwest Food Alliance Dairy Standards or an organic standard to add value to the milk.

Result 3: Outreach Programs.

LCMR Budget	\$19,650.00	Match	\$0
Balance	\$1,870.36	Match Balance	\$0
Completion Date:	See each step.		

Description:

Outreach and the dissemination of the results of these efforts will be an ongoing part of the work of the Chippewa River Team and Sustainable Livestock Systems project. A minimum of 300 people will be reached through Field Days, forums and workshops.

Result 3A. Field Days

Each farmer participant will be involved in 4 field days during the course of the project. The field day will focus on the methods identified and utilized to insure the farm plan is achieving its goals. Field days will feature renowned speakers on subjects that are chosen to present. Outreach for the field days will be accomplished through local media, the Chippewa Current newsletter, the Sustainable Farming Systems Team, the Sustainable Farming Association of Western Minnesota, and the State Sustainable Farming Association.

Result 3B. Workshops and Forums

At least two public workshops and forums will be conducted. The workshops will emphasize hands-on applications for developing whole farm plans and skills in using animal, pasture and soil monitoring tools. Workshops and forums will include information on topics such as Wintering Livestock, Goal Setting, Financial Planning and Monitoring and Strategies of Beginning Farmers.

Result 3C. Written and Video Material Dissemination

A collection of monitoring tools for monitoring animal health and production on pastures will be presented to supplement those developed by the Southeast Minnesota Monitoring Team. It will be disseminated to everyone who has acquired a copy of the Southeast Monitoring Team's Monitoring Toolbox. This toolbox is a collection of tools and techniques that can be used to monitor specific subjects on Farm. Information on the progress of the work and the content and availability of the collection will be disseminated through the Southeast Minnesota Monitoring Team's newsletter and through local media, The Chippewa Current newsletter, the Sustainable Farming Systems Team, the Sustainable Farming Association of Western Minnesota, the State Sustainable Farming Association and the Chippewa River Team.

Result 3D. Demonstration Video on the use of farm monitoring techniques

Lessons learned and results of the work of the Chippewa River Whole Farm Planning and Monitoring Team and the Sustainable Livestock Systems project will be developed into a training video featuring on farm monitoring of goal based, whole farm management strategies. Information on the availability of the video will be disseminated through the Southeast Minnesota Monitoring Team's newsletter and through local media, The Chippewa Current newsletter, the Sustainable Farming Systems Team, the Sustainable Farming Association of Western Minnesota, the State Sustainable Farming Association and the Chippewa River Team.

Application of outreach:

Workshops or field days were held on Whole Farm Planning, Winter animal housing (2), Summer pasture (4), and Food systems (3). The concern over foot and mouth disease led to cancellation of summer field days on farms. News articles and individual presentations are very numerous and uncounted. Special attention is called to two products. Grazing systems are perceived to be at the heart of sustainable livestock systems for Minnesota. However, the conventional method of grazing where animals have access to the entire pasture system is relatively unproductive and even leads to degradation of the pasture resource. There is a clearly demonstrated need for education in modern methods of developing and managing pastures. The first product is a web-based workshop that will be offered over the Internet. Previous experience showed us that many farmers that express an interest in an intensive workshop are unable to attend because of constraints of time and space. About 20% of the cost of completing the workshop came from the outreach budget. This project was selected as one of eight exemplar distance education projects at the university. The second product is a video modeling the whole farm planning process

Roger Indieke followed in planning and executing his pasture system as an adjunct to a very conventional commercial heifer-growing business. Mr. Indieke has also presented the results of the alfalfa grazing on-farm project at several locations. He and Joe Molitor, another of the farmer partners, have been extremely effective in outreach to other farmers. Peer education is very effective.

7(p) Sustainable Livestock Systems

Budget Reimbursement Spreadsheet

Result 1: Chippewa River Team

	<u>Budget</u>	<u>06/30/2000</u>	<u>1/29/2001</u>	<u>8/31/2001</u>
Wages	\$33,500.00	\$0.00	\$25000.00	\$39045.55
Equipment				
Development				
Acquisition				
Other:				
Supplies	\$9,000.00	\$0.00	\$5024.93	\$5099.17
Admin support	<u>\$7,500.00</u>	<u>\$0.00</u>	<u>\$5000.00</u>	<u>\$5855.28</u>
Total	\$50,000.00	\$0.00	\$35024.93	\$50,000.00

Result 2: Research

Personnel				
Asst Sci	\$66,000.00	\$24,001.40	\$20112.00	\$57480.00
Asst Sci	\$33,000.00	\$6,474.19	\$7554.27	\$16034.35
fringe ben.		\$2,307.98	\$5486.52	\$18858.94
Interns	\$14,000.00	\$3,096.00	\$7829.50	\$11091.55
On-farm Eqpt				
Truck lease	\$12,000.00	\$6,478.53	\$3000.00	\$12558.53
Corrals (increase to include sampling eqpt approved)	\$6,400.00	\$0.00	\$6000.00	\$12173.52
Development				
Farm fencing	\$11,250.00	\$0.00	\$6128.00	\$7864.44
Acquisition				
Other				
On-farm				
An care	\$30,000.00	\$0.00	\$24472.06	\$34192.12
travel to farm	\$2,700.00	\$559.70		
Monitoring	\$30,000.00	\$5,544.66	\$3397.45	\$27544.95
WCROC res.	<u>\$75,000.00</u>	<u>\$7,597.29</u>	<u>\$6664.63</u>	<u>\$67921.97</u>
	\$280,350.00	\$56,059.75	\$91139.48	\$278066.56

7(p) Sustainable Livestock Systems

Result 3: Outreach

Personnel

Equipment

Development

Acquisition

Other

Field Days/workshops

farm and delivery cost

Speakers

Facilities

Publicity

Hospitality

Publications

Written

Video

\$4,650.00				\$5034.85
\$3,000.00	\$467.14			\$2048.19
\$600.00				\$700.00
\$1,000.00	\$16.49			\$815.93
\$400.00	\$205.57	\$73.50		\$424.35
\$4,000.00	\$0.00	\$182.20		\$2442.69
<u>\$6,000.00</u>	<u>\$35.96</u>	<u>\$267.46</u>		<u>\$6313.63</u>
Total	\$19,650.00	\$725.16	\$523.16	\$17779.64

V. DISSEMINATION

Result 3 described above is a comprehensive program of outreach.

VI. CONTEXT:

A. Significance: On-farm research and education programs and intensive experiment station research will support small to moderate-scale farms through whole farm planning and monitoring of forage-based livestock systems. This project will generate research data and on-farm demonstrations that apply to specific needs of farms involved forage-based livestock production systems. These needs include effects of forage-based livestock production systems on farm diversity, farm economics, and environmental effects on the landscape.

B. Time: July 1, 1999 - June 30, 2001.

C. Budget Context: 1. LCMR Budget History: \$180,000 committed through the Sustainable farming Systems Project . 2. Non-LCMR Budget History. Minnesota Institute for Sustainable Agriculture granted \$89,500 to the Chippewa Whole Farm Planning and Monitoring Team, The Minnesota office of Environmental Assistance has provided \$50,000. 3. Total: \$ 319,500.

1. BUDGET:

Personnel	\$146,500	
	Terry VanderPol: Facilitator 75%	
	Audrey Arner: Facilitator 25%	
	Assistant Scientist: Coordination/Data Management 100%	
	Assistant Scientist: Research Collection/Data Management 50%	
	2 Interns: Research Collection 100%	
Equipment	\$18,400	
	Truck Lease \$12,000	
	Light weight, Portable Corrals \$6,400 (Will be fully expended)	
Acquisition	\$0.00	
Development	\$11,250	
	On-Farm Fencing \$11,250	
Other	\$173,850	
	<i>On-Farm</i>	
	Farmer Animal Care (8 farmers at \$70/au/year)	\$30,000
	Travel to Farm	\$ 2,700
	Farm monitoring data/sample collection/analysis	\$30,000
	<i>WCROC</i>	
	WCROC data/sample collection and analysis	\$75,000
	<u>Water sampling equipment \$7436.23</u>	
	Field Days	
	Farmer and WCROC Field Days (farmer stipend and delivery costs).	\$ 4,650
Workshops		

Speakers	\$ 3,000
Facilities	\$ 600
Outreach & Publicity	\$ 1,000
Hospitality	\$ 400
Written Materials	
Printed Material for Monitoring Tool Box	\$ 4,000
Training Video	\$ 6,000

VII COOPERATION:

Chippewa River Whole Farm Planning and Monitoring Team:

Audrey Arner, Land Stewardship Project
 David Soehren, Minnesota DNR
 Terry VanDerPol, Community Resources
 Paul Lines & Anita Zelenka, Farmers
 Sherman & Anne Olson, Farmers
 Bill Head, West Central Research and Outreach Center
 Mike & Jen Berven, Farmers
 Helene Murray, MISA
 Tom Warner, Chippewa County NRCS
 Dennis Johnson, West Central Research and Outreach Center
 Steve Jorgensen, Farmer
 Jean Diggins, Chippewa County NRCS
 Joe Magner, Minnesota Pollution Control Agency
 Gary Lentz, Land Owner
 Greg Cuomo, West Central Research and Outreach Center
 Hugh Chester-Jones, Southern Research and Outreach Center
 Bob Padula, University of Minnesota Extension, Chippewa County
 Don and Dan Struxness, Farmers
 Margot Rudstrom, West Central Research and Outreach Center
 Neil Hansen, West Central Research and Outreach Center
 John Cunningham, University of Minnesota Extension, Big Stone County

Cooperators not members of the Chippewa River Team

Craig Williams and Randy Pitcher
 Jeff Petersen, Farmer
 Roger Imdicke, Farmer
 Bob & Carol Hall, Farmer
 Dan and Ed Persons, Farmer
 John Essame, Farmer,,
 Joe and Tom Molitor, Farmer

VIII. LOCATION: The farm sites will be primarily in west central Minnesota clustered around the Chippewa River at: Milan, Watson, Kerkhoven, Maynard, Morris, Osakis, St. Cloud, Bertha, Staples, and Hoffman. Some will be in other western Minnesota locations. The intensive research will be at the West Central Research and Outreach Center, Morris and at selected cooperator farms.