

FIVE YEAR SUMMARY REPORT
BEEF COW-CALF DEMONSTRATIONS ON
NORTHERN MINNESOTA FARMS

UNIVERSITY OF MINNESOTA
DOCUMENTS

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Five Year Summary Report
Northern Minnesota Beef Demonstration Project
Upper Great Lakes Regional Commission
University of Minnesota

Participation

Upper Great Lakes Regional Commission

Grant funds for the following:

- Personnel: Area Extension Agent, Seasonal technician and secretarial assistance - salary, fringe benefits and travel support.
- Supplies: Fertilizer, seed, herbicides, fencing, etc., to provide for on-farm demonstrations.
- Equipment rental: To provide for demonstrations where farmer equipment was not available or adequate.
- Publications: Northern Minnesota Beef Newsletter
The Minnesota Beef Cow-Calf Industry Survey Report

University of Minnesota

Personnel and support funds to organize and carry out the demonstration farm program.

- Personnel: Extension subject matter specialists, field staff and administrative staff devoting part time to this effort, amounting to a total of over 1.5 full time man equivalents.
- Office: Facilities are provided for Area Agent, secretarial and other project staff.
- Travel: Travel support funds have been provided for the above staff.

PROJECT OBJECTIVE

To demonstrate more profitable ways to organize and operate beef cow-calf enterprises on farms and ranches producing feeder cattle in the Upper Great Lakes Region of Minnesota. Through this enterprise to provide a greater income for the three state region by effective utilization of the available resources, principally excellent forages and available family labor.

SITUATION AND PROBLEMS

Beef cow-calf production is an important agricultural enterprise in the Upper Great Lakes Region area of Minnesota and makes a substantial contribution to the economy. Numbers of beef cows in northern Minnesota increased from 57,000 in 1954 to about 300,000 at the present time. Climatic limitations (a cool, relatively short growing season) and distance to markets for fluid milk limit agricultural alternatives in the region and the beef cow provides the most suitable alternative on many farms. In the northeast and north central area of the state, beef cow-calf production fits in well with part-time farming and utilizes the areas grasslands. In the northwest, west central, and east central areas, beef cow-calf production is a full time agricultural enterprise on many farms and provides an outlet for the grain and forage crops produced on the farm.

There are substantial differences in management techniques needed for beef cow-calf production in northern Minnesota as compared to the cattle producing area in the corn belt and range states. Differences in soils, climate, and marketing necessitate the development and adoption of technology suitable for this area. Although new technology for this area has been developed through research at agricultural experiment stations, on-farm adoption has lagged. The demonstration farm concept has proved an effective educational method to acquaint producers with new technology that will help maximize the use of their resources and thereby improve family living and contribute to economic growth and development of the region.

PROGRESS

Since the project was initially funded in 1974, demonstrations and educational activities have been carried out at the eight cooperating farms and ranches located in Beltrami, Cass, Carlton, Itasca, Mahnomen, Roseau, and Ottertail counties. The farms are typical to the area and are located so that they are convenient for producers throughout northern Minnesota to visit and attend the scheduled educational activities. In addition, educational workshops and meetings have been held throughout the thirty-eight county regional area in Minnesota to familiarize producers with the demonstrations and review the improved practices demonstrated and the results.

A quarterly newsletter, Northern Minnesota Beef News, containing information on activities at the cooperating farms and ranches and timely articles on beef cow/calf production has been sent out to 8,000 producers and other interested persons.

The demonstrations carried out successfully at the eight cooperating farms and ranches involve all phases of management as follows:

Farm Management

1. Beef Producer Survey
2. Annual beef cow budgets on each farm
3. Annual financial analysis
4. Calf vs yearling sale - Kenner Ranch
5. Long Range Budget - Disterhaupt Ranch
6. Hay Harvest & Handling Systems - Bulletin #246
7. Pasture Systems Cost and Returns

Land Management

1. Pasture systems and grazing management
2. Soil management - annual analysis & fertilizer application on all farms, nitrogen plots
3. Land Clearing - Moe, Savich, and Evensen Farms
4. Weed control - herbicide plots and chemical and mechanical control methods on pastures and hayland
5. Rodent control
6. New conservation methods of pasture seeding (direct sod interseeding)

Animal Management

1. Animal weigh data and pasture production gains
2. Use of growth stimulants on calves and yearlings
3. Insect control with oilers and dust bags
4. Handling facilities (corrals)
5. Calf warming boxes and shelters
6. Castrating, dehorning, parasite control
7. Performance testing
8. Fencing systems - permanent and temporary
9. Alternative sources of winter feed (Aspen bark)
10. Reducing pasture bloat hazard

These improved management practices are demonstrated to other producers at field days and workshops held at the cooperator farms in summer months and with slides of the improved management practices at the farms that are shown at winter meetings held throughout the region.

A definite sequence of educational workshops have been held at the cooperating farms and ranches beginning in 1975. University of Minnesota agricultural extension specialists and the project area extension agent serve as the instructors at these workshops. A pasture and forage workshop has been held in the summer months and a livestock management workshop in the fall.

The five year sequence of workshops held at the demonstration farms and ranches is as follows:

<u>Date</u>	<u>Topic</u>	<u>Extension Specialist - Instructors</u>
July - 1975	Pasture Species & Establishment	Dr. H. Otto - Agronomist G. J. Sullivan - Project Area Agent
October - 1975	Performance Testing	Dr. R. Arthaud - Animal Husbandman D. W. Bates - Agr. Engineer G. J. Sullivan - Project Area Agent
July - 1976	Pasture Systems & Interseeding	Dr. N. Martin - Forage Agronomist G. J. Sullivan - Project Area Agent
	Beef Outlook	Dr. P. Hasbargen - Farm Management Economist
October - 1976	Wintering the Beef Herd	R. E. Jacobs - Animal Husbandman G. J. Sullivan - Project Area Agent
July - 1977	Grazing Results, Weed Control, Fertilization	Dr. N. Martin - Forage Agronomist Dr. O. Strand - Weed Control Agron. Dr. W. Fenster - Soil Scientist G. J. Sullivan - Project Area Agent
October - 1977	Castrating & Dehorning	Dr. J. Hillgren - Veterinarian Dr. R. Arthaud - Animal Husbandman
	Insect & Parasite Control	G. J. Sullivan - Project Area Agent
July - 1978	Forage Production & Harvesting	Dr. N. Martin - Forage Agronomist J. A. True - Agr. Engineer G. J. Sullivan - Project Area Agent
September - 1978	Beef Grading, Marketing, and Price Outlook	Dr. R. Arthaud - Animal Husbandman Dr. P. Hasbargen - Farm Management Economist K. E. Egertson - Livestock Marketing Economist G. J. Sullivan - Project Area Agent
June - 1979	Pasture Fertility and Weed Control	Dr. O. Strand - Extension Agronomist W. Jokela - Extension Soil Specialist G. J. Sullivan - Project Area Agent

<u>Date</u>	<u>Topic</u>	<u>Extension Specialist - Instructors</u>
September - 1979	Herd Health, Nutrition, and Marketing Workshop	Dr. R. Arthaud - Animal Husbandman Dr. D. Haggard - Extension Beef Veterinarian Dr. P. Hasbargen - Farm Management Economist G. J. Sullivan - Project Area Agent

A map of the Upper Great Lakes Region Area in Minnesota and the location of the demonstration cooperators farms and ranches is attached.

EVALUATION OF THE PROJECT

The Northern Minnesota Beef Project has had a very favorable acceptance and a high credibility with producers and agricultural professionals. The demonstration farms and ranches have provided an excellent teaching and learning environment for Extension educational programs for beef cow-calf producers. Based on attendance records for the on-farm workshops and county and regional meetings on the project, it is estimated that 65% of the beef producers in the regional area attended one or more of the educational activities in the five year period. On an annual basis, over 3,000 person contacts were made. In addition, the demonstration farms and ranches were used as training sites for agricultural professionals in the Agricultural Extension Service, Soil Conservation Service, Farm Home Administration, Agricultural Stabilization and Conservation Service, and Vocational Agricultural Instructors.

The demonstration results have been used not only in northern Minnesota, but also on a state-wide basis and by many other states including Wisconsin and Michigan. Agricultural representatives from other states have visited the project farms and Minnesota extension specialists have made presentations on the project at professional and beef industry meetings at a number of national meetings.

A report on the economic aspects of the beef project and a recently published article from the Farmer magazine are attached.

The Minnesota Agricultural Extension Service and the northern Minnesota beef cow-calf industry are very appreciative of the financial assistance provided by the Upper Great Lakes Regional Commission that made the project possible.

ECONOMIC ASPECTS
OF THE
UPPER GREAT LAKES BEEF PROJECT*

To help achieve the project objective of demonstrating "more profitable ways to organize and operate beef cow-calf farms" in northern Minnesota, the following activities have been completed or are underway:

1. Economic evaluation of specific management and marketing practices.
 - a. Returns over costs for implanting have been evaluated.
 - b. Returns over costs from creep feeding have been evaluated.
 - c. Returns over costs from pasture fertilization are being evaluated.
 - (1) If pasture is available for rent, this is usually a cheaper source of added pasture than can be obtained by fertilizing bluegrass.
 - (2) If pasture can be renovated, it usually pays to do so-- especially if alfalfa can be produced. (Appendix I shows some data comparing the added costs and added returns from improving pastures for grazing yearling steers that was used at the May Extension Directors' Training Conference.)
 - d. Beef price outlook information was used along with cost information to develop some marketing management suggestions that were disseminated quarterly through the Beef News Notes publication.
 - e. The Upper Great Lakes cooperators have provided feeder cattle for use in demonstrations at which we discussed the new feeder cattle grades and prevailing prices for cattle of different quality, weight, and sex. This information has helped beef producers to obtain fair market prices for their cattle.
2. Economic evaluation of the beef cow enterprise.
 - a. In January of each year information was gathered from each cooperator relative to his beef production costs. This was used to project probable returns over feed and cash costs for each cooperator's cow-calf operation.
 - b. These individual projections were used to develop an "average" production cost and return budget for a 100 head beef cow herd under different levels of feeder steer prices and production efficiency levels. (See Appendix II for a copy of the beef cow herd budget projected last January for average cow herd returns in 1979. Returns look good for 1979--but they were negative for several years prior to 1978.)

* Prepared by Paul R. Hasbargen, Professor and Extension Economist, Department of Agricultural and Applied Economics, University of Minnesota.

- c. The enterprise information is also used each fall when projecting cow-calf and overwintering budgets for use in our annual fall outlook publication. (This year this information has been sent to almost every farmer in the state because of its publication by The Farmer magazine.
 - d. The data obtained from these farms also helps in the periodic update of our Beef Cow Herd Planning Guide and in preparing economic as well as production management materials for cow-calf educational meetings.
3. Economic evaluation of specific management systems.
- a. A study of alternative hay harvest and handling systems has been completed. (Extension Folder 246, revised 1976)
 - b. A study is in progress which compares the net returns of the cow-calf system with the cow-yearling system through all stages of the beef cycle.
 - (1) Data being gathered on the resources required to grow out calves on the Kenner farm in Roseau County has been used to estimate the odds of getting different levels of returns from feed and other costs based on costs and feeder prices during the past 30 years.
 - (2) The information obtained from these comparisons was used in educational meetings to encourage cow-calf operators to overwinter their calves the past 2 years. (See P.S. on attached letter to one of the cooperators reproduced as Appendix III.)
 - (3) However, historical return patterns suggest that resources might best be used in a cow-calf program during the next few years rather than in a cow-yearling program. Appendix IV is being used at cattle outlook meetings this fall to illustrate this. Appendix V shows the projected returns to overwintering calves that was included in our fall outlook report this year.
 - c. The data gathered on the several forage systems is currently being used to make economic evaluations of different crop and beef production systems under various farm resource and price combinations. (Linear programming computer models are being developed and used to determine the impact of different forage programs on beef farm incomes on different types of farms for each major soil type in northern Minnesota.)
4. Economic analysis of the total farm business and financial projections.
- a. A total farm business financial analysis was made for several of the cooperators during the early years of the project.
 - b. Such analyses have been used along with others obtained from farm management record keeping groups to help us to monitor the economic health of beef cow farms in northern Minnesota.

- c. We have made forward budget projections of the total farm business under alternative farm business organizations and alternative efficiency levels for some cooperators as well as for other interested farmers.
- d. Some of these analyses and projections were used in educational workshops with the Farmers Home Administration supervisors in northern Minnesota.

5. Economic impact study on the total economy of northern Minnesota.

- a. Estimates are now being made of the possible economic impact upon this area of the state if education programs could help all northern Minnesota beef producers to adopt the improved management practices and systems demonstrated on the Upper Great Lakes demonstration farm in the past 5 years.
- b. Some early estimates of the approximate economic effects of such changes are shown in Appendix VI.

(1) The potential increase in individual net farm income acquired ~~through improved forage and livestock management can be as high as \$3,302 per year.~~

(2) The Upper Great Lakes Region could experience an increase of \$39,624,994 in net farm income and the multiplier benefits of gross income could provide a potential \$332,916,416 to the region's economy.

Value Produced Per Cwt. Of Gain From Pasturing Cattle During The
Past 10 Years, In 1977 Dollars

	May Price 525 Lb. Steer	October Price* 740 Lb. Steer	Gross Margin	
			Per Head (216 Lb. Gain)	Per Cwt.
1969	\$68.57	\$56.50	\$ 40.45	\$18.73
1970	69.18	56.08	34.13	15.80
1971	63.82	56.79	67.56	31.28
1972	67.79	68.02	129.86	60.12
1973	82.48	73.30	91.83	42.51
1974	51.56	38.02	-7.18	-3.32
1975	39.38	41.49	82.44	38.17
1976	45.80	37.19	16.82	7.79
1977	45.23	39.26	35.22	16.31
1978	58.49	58.05	104.85	48.54
3-year average (1976-78)			52.30	24.21
10-year average (1969-78)			59.60	27.59
30-year average (1949-78)			67.55	31.27
27-year average (skip 3 bust years)			72.38	33.51
27-year average (inflated to 1979 dollars)			84.00	39.00
Historical cash costs per cwt. of gain (1979 \$)				11.00
Maximum net value to impute to added gain in past				28.00

* Good to choice steers at South St. Paul.

Marginal Returns and Marginal Costs From Improved Pasture Systems
On The Homer Kenner Ranch, 1976-78

	Unimproved Rotationally Grazed Bluegrass	14A Fert. Bluegrass 15A Birdsfoot Trefoil	14A Fert.-Brome 24A Alf.-Grass
Beef gain/acre	94	239	256
Net gain (assumes a 10% shrink)	84.6	215.1	230.4
Net value @ \$15/cwt.	\$12.69	\$32.27	\$34.56
Added return/acre	--	19.58	21.87
Net value @ \$28/cwt.	23.69	60.23	64.51
Added return/acre	--	36.54	40.82
Added costs/acre	--	34.00	35.00

COMPUTER DECISION AIDS
EXTENSION FARM MANAGEMENT
AGRI. EXTENSION SERVICE
UNIVERSITY OF MINNESOTA

AGRICULTURAL ECONOMICS PROGRAM:
BEEF COW HERD BUDGET
RESULTS FOR: MR. CONNOR - *Ave of UGL farm*
01-16-79 NORTHERN MINN. *projections for '79*

BEEF COW-CALF BUDGET AND RETURN TABLES

	HERD	PER COW
HERD SIZE AND PERFORMANCE:		
NUMBER OF COWS IN HERD.....	100	
NUMBER OF REPLACEMENT HEIFERS.....	14	
PERCENT CALF CROP.....	90	
PERCENT COWS CULLED ANNUALLY.....	13	
PERCENT DEATH LOSSES.....	1.50	
VALUE PRODUCED:		
45 STEER CALVES 425 LBS :: \$90.00.....	17212.50	
31 HEIFER CALVES 403 LBS :: \$76.50.....	9420.50	
13 CULL COWS 975 LBS :: \$48.00.....	6084.00	
TOTAL SALES.....	32717.00	327.17
FEED REQUIREMENTS (HERD) AND COSTS:		
HAY 300.0 TONS :: \$35.00.....	10500.00	105.00
SILAGE 550.0 TONS :: \$ 5.00.....	2750.00	27.50
CORN 300.0 BU. :: \$ 2.25.....	675.00	6.75
MINERAL 50.0 CWT :: \$ 9.00.....	450.00	4.50
TOTAL FEED COST.....	14375.00	143.75
OPERATING COSTS:		
INTEREST ON ANIMAL DEBT(***%).....	5000.00	50.00
BREEDING COSTS.....	750.00	7.50
SELLING COST.....	611.50	6.12
OTHER OPERATING COSTS.....	1800.00	18.00
TOTAL OPERATING COSTS.....	8161.50	81.61
TOTAL FEED AND OPERATING COSTS.....	22536.50	225.36
BUDGETED RETURN TO LAB., FACILITY, EQUITY IN COWS	10180.50	101.80

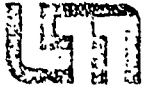
RETURN TO HERD FOR LABOR, FACILITIES, AND COW EQUITY CAPITAL

STEER PRICE	PER CENT CALF CROP				
	80	85	90	95	100
80.00	4199	5710	7221	8733	10244
85.00	5486	7093	8701	10308	11916
90.00	6774	8477	10180	11884	13597
95.00	8061	9861	11660	13460	15259
100.00	9349	11244	13140	15035	16931

RETURN TO HERD FOR LABOR, FACILITIES, AND COW CAPITAL

WEARING WEIGHT	PER CENT CALF CROP				
	80	85	90	95	100
385	4592	6133	7674	9215	10755
405	5683	7305	8927	10549	12171
425	6774	8477	10180	11884	13587
445	7964	9649	11434	13219	15003
465	9155	10821	12687	14553	16419

RETURN TO HERD FOR LABOR, FACILITIES, AND EQUITY
CAPITAL AFTER INCOME TAX



UNIVERSITY OF MINNESOTA

AGRICULTURAL EXTENSION SERVICE

Department of Agricultural and Applied Economics
St. Paul, Minnesota 55108

Appendix III

March 28, 1977

Kurt Lorensen
Sebeka, MN

Dear Kurt,

Enclosed is a projected beef budget for your herd for 1977. If you can really hold feed costs to \$125 per cow I expect they will produce enough to at least cover feed and cash costs this year. Most people show about \$150 per cow feed costs.

I hope that you get enough rain so that you can produce hay for \$40 per ton. When yields are low, the cost per ton gets pretty high.

Looking forward to seeing green pastures on your place when we gather there on June 9.

Sincerely,

Paul R. Hasbargen
Extension Economist
Farm Management

PRH/js

Enclosure

cc: J. Sullivan

P.S. Perhaps I should mention something that I reported on before you joined us at Bemidji. That is, that during this stage of the cattle cycle it usually pays to shift from a cow-calf to a cow-yearling program. Total returns to a given supply of feed will be higher if fewer cows are kept and some of the feed is used to carry the calves another 8-10 months. I am enclosing a copy of a budget which shows that Kenner made \$60 more per steer calf held over the past two winters compared to typical losses of \$40 to \$50 per cow kept.

Returns over feed and cash costs in this cattle cycle matched with comparable years in a previous cattle cycle - in 1979 dollars^{1/}

Years		Per Beef Cow Calf Sold ^{2/}		Per Calf Overwintered ^{3/}		Per Calf Overwintered Plus Pasture ^{4/}	
Earlier Cycle	Current Cycle	1950's	1970's	1950's	1970's	1950's	1970's
1953	1974	-147	-257	-95	-156	-58	-183
1954	1975	-39	-138	9	-41	6	38
1955	1976	-62	-97	15	-27	64	-21
1956	1977	-21	-16	-20	12	43	34
1957	1978	47	199	44	92	120	155
1958	1979	187	200 ^{5/}	91	100 ^{5/}	142	125 ^{5/}
1959	1980	80		5		21	
1960	1981	138		-13		-3	
1961	1982	15		-15		54	
1962	1983	26		7		79	
Total		224	-109	28	-20	468	148
Average		22	-18	3	-3	47	25

^{1/} Note that if this cycle continues to follow the pattern of the 1950 cycle, the cow-calf enterprise should give very high returns for two more years; but carrying calves to May or next October will likely give only average returns.

^{2/} Based on the summaries of records kept by members of the Southwestern Farm Management Association.

^{3/} Based on estimates of costs and returns on steer calves gaining 1 pound per day. Short yearlings are sold in May at 625 pounds.

^{4/} Based on estimated costs and returns from oversummer gain of 1.2 pounds per day following winter gains of 1 pound per day. Long yearlings are sold in October at 787 pounds.

^{5/} Estimated based on expected fall feeder prices.

COMPUTER DECISION AIDS
EXTENSION FARM MANAGEMENT
AGRI. EXTENSION SERVICE
UNIVERSITY OF MINNESOTA

AGRICULTURAL ECONOMICS PROGRAM:
CATTLE FEEDING BUDGET
RESULTS FOR: OVERWINTER CALVES
08-16-79 BEEFLAND, MINNESOTA

BUDGET FOR STEEP CALF

	HEAD	CWT GAIN
PERFORMANCE:		
PURCHASE WEIGHT, LBS	430.	
SELLING WEIGHT, LBS	650.	
TOTAL GAIN, LBS	220.	
AVERAGE DAILY GAIN, LBS	1.22	
DAYS ON FEED	180.	
VALUE PRODUCED:		
SALE VALUE AT \$ 85.00 /CWT.....	\$ 552.50	
PURCHASE COST AT \$100.00 /CWT	430.00	
GROSS MARGIN	122.50	\$ 55.68
FEED REQUIREMENTS AND COSTS:		
CORN 9.00 BU AT \$ 2.50	22.50	10.23
HAY 1.15 TON AT \$ 35.00	40.25	18.30
MINERAL .30 CWT AT \$ 9.00	2.70	1.23
TOTAL FEED COST	65.45	29.75
OPERATING COSTS:		
INTEREST ON ANIMALS (11.0 PERCENT) ..	23.33	10.60
DEATH LOSS (1.0 PERCENT)	4.53	2.06
SELLING AND BUYING COSTS	2.50	1.14
OTHER OPERATING COSTS	6.00	2.73
TOTAL OPERATING COSTS	36.36	16.53
TOTAL FEED & OPERATING COSTS	101.81	46.28
BUDGETED RETURN TO LABOR & FACILITIES..\$	20.69	9.40

RETURN PER HEAD FOR LABOR & FACILITIES WITH DIFFERENT PRICES

SELLING PRICE/CWT	WHEN PURCHASE COST PER CWT IS:				
	94.00	97.00	100.00	103.00	106.00
81.00	22.16	8.43	-5.31	-19.05	-32.78
83.00	35.16	21.43	7.69	-6.05	-19.78
85.00	48.16	34.43	20.69	6.95	-6.78
87.00	61.16	47.43	33.69	19.95	6.22
89.00	74.16	60.43	46.69	32.95	19.22

BREAK EVEN SELLING PRICES THAT WILL COVER FEED, OPERATING,
AND \$15.00 RETURN FOR LABOR AND FACILITIES.

PURCHASE PRICE/CWT	WHEN HAY PRICE PER TON IS:				
	28.00	31.50	35.00	38.50	42.00
94.00	78.66	79.28	79.90	80.52	81.14
97.00	80.77	81.39	82.01	82.63	83.25
100.00	82.89	83.51	84.12	84.74	85.36
103.00	85.00	85.62	86.24	86.86	87.48
106.00	87.11	87.73	88.35	88.97	89.59

NOTE: TO COVER ONLY FEED AND OPERATING COSTS SUBTRACT \$ 2.31

Value Of Increased Beef Productivity In Northern Minnesota

January 1, 1979 - Beef cows and heifers that have calved in the 38 Upper Great
Lake counties = 229,100

A. Calf Crop Increase

<u>Calf Crop</u>	
90%	206,190
85%	<u>194,735</u>
5% improvement = 11,455 (extra calves)	

11,455 calves x \$336/calf* = \$3,848,880

* using long run planning price of 80¢/lb. @ 420 lbs./calf

B. Calf Weight Increase From Growth Implants - 28 lbs./head

Value of added weight - 194,735 calves x 28 lbs. x 80¢/lb.	= \$4,362,064
Less added cost of implants - 194,735 calves x \$1/hd.	= <u>- 194,735</u>
net value	<u>\$4,167,329</u>

C. Increased Calf Weaning Weight From Better Pasture, Earlier Calving, Performance Testing and Better Breeding - 40 lbs.

Value of added weight - 194,735 calves x 40 lbs. x 80¢/lb.	= \$6,231,520
Less added cost of \$16/calf x 194,735 calves	= <u>-3,115,760</u>
	<u>\$3,115,760</u>

D. Increased Calf Weight From Insect and Parasite Control - 20 lbs.

Value of added weight - 194,735 calves x 20 lbs. x 80¢/lb.	= \$3,115,760
Less added cost of insecticide and equip. of \$1/hd.	= <u>- 194,735</u>
	<u>\$2,921,025</u>

E. Total Added Net Value Of Calf Crop With:

100% adoption rate due to improved forage and livestock management	<u>\$14,052,994</u>
Net value with 25% adoption rate	\$3,513,248
Net value with 50% adoption rate	\$7,026,497
Net value with 75% adoption rate	\$10,539,745

Increased Land Productivity From Better Pasture Management

229,100 beef cows x 6 acres/cow = 1,374,600 acres of land required per cow

6A/cow - average requirements

- (1) 3A/cow - possible achievement with improved forage management
- (2) 4A/cow - other attainable goals
- (3) 5A/cow - other attainable goals

Amounts of land that can be diverted to crop use

- (1) 3A/cow - productivity releases 3 acres of land = 687,300 acres
- (2) 4A/cow - productivity releases 2 acres of land = 458,200 acres
- (3) 5A/cow - productivity releases 1 acre of land = 229,100 acres

Option I. Use Of Released Acres To Produce Crops In Same Proportion Now Produced In The Area

Crop	% of Land Use	687,300A	Total Production	Total Gross Value	Gross Value /Farm1/	Total Net Value	Total Net /Farm	Market Value2/	Cost /Unit3/	Yields4/
Oats	20%	137,460A	7,422,840 bu.	\$10,763,118	\$ 897	\$ 2,449,537	\$ 204	\$1.45/bu.	\$1.12/bu.	54 bu./A
Barley	4	27,492	1,374,600 bu.	3,092,850	258	975,966	81	2.25/bu.	1.54/bu.	50 bu./A
Sunflowers	2	13,746	10,309 tons	2,267,980	189	824,720	68	\$11/cwt.	\$7/cwt.	1500 lbs./A
All wheat	7	48,111	1,635,774 bu.	6,134,153	511	1,946,571	162	3.75/bu.	2.56/bu.	34 bu./A
All hay	67	460,491	1,151,227 tons	40,292,945	3,357	5,180,521	431	\$35/ton	30.50/ton	2.5 ton/A
Total		687,300	--	\$62,544,000	\$5,212	\$11,369,280	\$ 947	--	--	--

Option II. Alternative Crop Production Proportions Of Released Land

Hay	33%	229,100A	572,750 tons	\$20,462,250	\$1,670	\$ 2,577,375	\$ 214			
Sunflowers	33	229,100	171,825 tons	37,801,500	3,150	13,746,000	1,145			
Wheat	33	229,100	7,789,400 bu.	29,210,250	2,434	9,269,386	772			
Total		687,300	--	\$87,048,000	\$7,254	\$25,572,000	\$2,131			

1/ 12,000 farms for 38 Upper Great Lake counties.

2/ Farm Planning Prices, projected by Agricultural Extension Economists, University of Minnesota, for 5-year planning price.

3/ What To Grow In 1979 In Northeast Minnesota, FM 418.2 NE.

4/ Minnesota Agricultural Statistics - 1979

Economic Impact For Upper Great Lake Region

Assumes 100 percent adoption rates and the reduction of the land requirement from 6 acres per cow to 3 acres per cow.

A. Maximum Net Income Benefits Per Farm

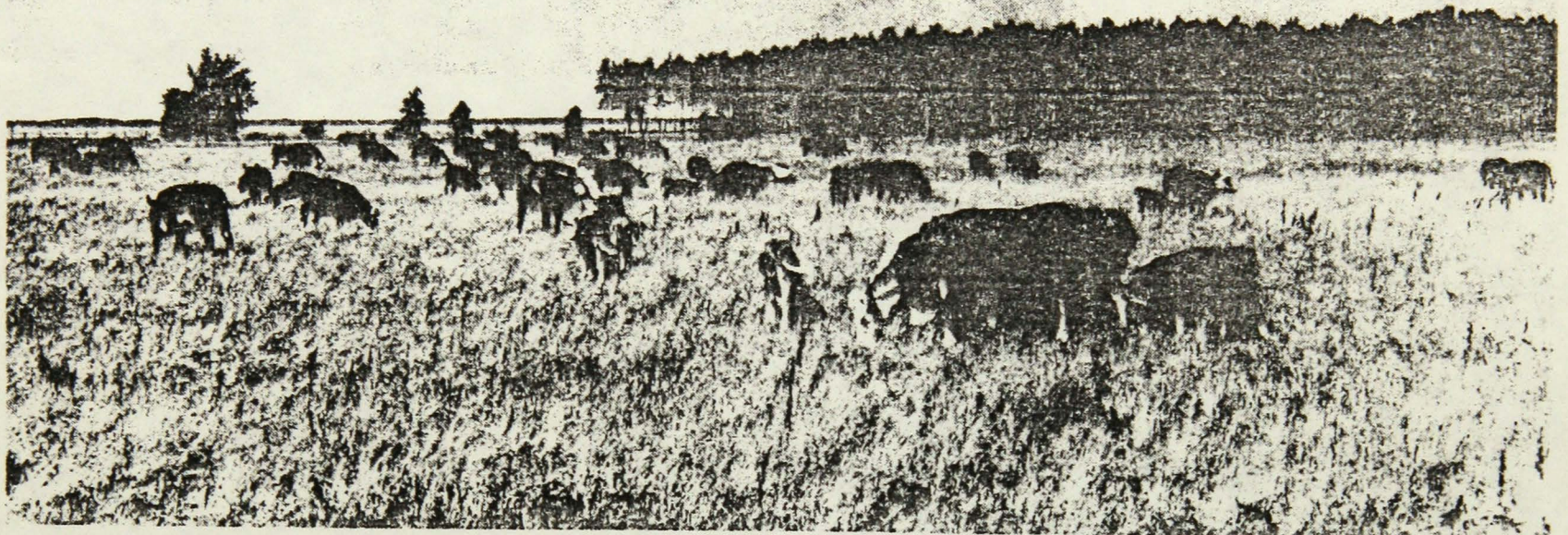
Increased income from calf crop	\$1,171
Increased income from option II crops	<u>2,131</u>
Added income per farm	\$3,302

B. Net Income Effect To Northern Minnesota Agricultural Producers

Added value of calf crop	\$14,052,994	\$14,052,994
Added value with option I crop	<u>11,369,280</u>	
Total	\$25,422,274	
Added value with option II crop		<u>25,572,000</u>
Total		\$39,624,994

C. Gross Income Multiplier Effects To Northern Minnesota's Economy

	(multiplier)	
Gross added value of calf crop	$\$17,943,104 \times 4 =$	\$ 71,772,416
Gross added value of option I crop	$\$62,544,000 \times 3 =$	<u>187,632,000</u>
Total		\$259,404,416
Gross added value of calf crop	$\$17,943,104 \times 4 =$	\$ 71,772,416
Gross added value of option II crop	$\$87,048,000 \times 3 =$	<u>261,144,000</u>
Total		\$332,916,416



Improved pastures boosted beef gains 153-652% for seven northern Minnesota ranchers cooperating in the beef demonstration project.

Northern Minnesota Beef Demonstration Project shows:

Near-triple gains on improved pasture

by Jack Sperbeck
University of Minnesota
Extension Information Service

ALMOST a three-fold increase in animal gains per acre. That's how improved pasture systems, with legumes, compared to unimproved pastures in the recently-completed Northern Minnesota Beef Demonstration Project.

"The project showed that good pasture management can result in phenomenal increases in animal gain per acre," says Neal Martin, forage agronomist with the University of Minnesota's Agricultural Extension Service. Martin is one of several U of M extension specialists who worked with the program.

Seven ranchers, picked to be representative of beef producers in northern Minnesota, had cattle with live weight gains ranging from 153% to 652% on the improved pastures. The table below shows results by individual ranch.

Results for the first three ranches listed are for three years of pasture improvement work—

1976 through 1978. The next two—Lorenson and Preisler—are for two years, 1977-78. Seifert is for one year, 1978, and the Evenson ranch results are for both 1977 and 1978.

The first six rancher-cooperators in the table used a legume-grass mixture in one pasture and fertilized grass in another. Animals were rotated between these pastures, using fertilized grass in spring and fall and the legume-grass mix in summer. Evenson had a reed canarygrass system and applied 125 lbs/a of nitrogen in split application—75 lbs in spring and 50 lbs July 1.

Implanting

The project demonstrated that you can make some money by implanting. Eddie Disterhaupt, Moose Lake rancher, says his implanted calves averaged about 25 lbs heavier. At today's prices, that means he's getting about \$25 back per dollar invested in implants.

"The day I spend implanting is the most profitable day of the year," he says. Cost of the implant is less than a dollar. But,

with 125 calves, Disterhaupt makes an extra \$3,000 for a day's work.

Returns from implanting will vary. Homer Kenner, Wannaska rancher, figures implanting returns 10 to 20 times the cost of the implant. He implants only steer calves and steer yearlings, since he keeps most of his heifers. And the labor involved in implanting may not be a big factor, since many times you're working with the cattle anyway, he adds.

When the project started in 1974, a survey showed that only about 4.6% of Minnesota beef cow owners were implanting suckling calves, according to Ray Arthaud, U of M extension animal scientist.

"Now we think that figure is about 20%, a four-fold increase," says Arthaud. "The project has had a good 'spill-over' effect. Many other beef producers have seen results of the project and adapted many of the management projects. For example, a neighbor of one of the cooperating ranchers started implanting calves in his 650-cow herd after he saw how it paid off."

Pasture management

Martin says using legumes for summer pasture in July and August allows for top animal performance in these months. Permanent pasture with extra nitrogen can be used for fall pasture.

You need a controlled stocking rate and grazing duration to force animals to defoliate all plant species in the pasture at

the same rate and to allow plants to rebuild root reserves for recovery.

Legumes require phosphorus and potassium fertilizer to survive in a mixture with grasses. Martin says some producers make the mistake of fertilizing based on dollars per head per year, instead of on fertilizer analysis.

"Maintaining maintenance levels of phosphorus and potassium, based on soil test recommendations, should be your first priority when you allocate dollars to fertilizer. Use nitrogen fertilizer **only** to increase grass productivity when you expect a pasture shortage," Martin advises.

How profitable is it to put nitrogen on grass pasture? Martin says it's difficult to pinpoint, but he advises **not** applying nitrogen to grass unless you need more forage.

"Most pasture is under-utilized in June and over-utilized in August. Perhaps one nitrogen application of 50 to 75 lbs/a in mid-June to July will be profitable in many pasture systems, he suggests.

A computer analysis of different farm situations shows that pasture renovation—that is, converting bluegrass to alfalfa-grass pasture—usually is more profitable than simply fertilizing bluegrass.

"Nitrogen now is too expensive to justify much use on grass pastures. It's cheaper to use legumes," says Paul Hasbargen, U of M farm management specialist.

Clip pastures to control weeds (to following page)

Ranch	Live weight gain, lbs/a		Percent change
	Unimproved	Improved	
Kenner	100	256	153
Disterhaupt	92	348	265
Savich	47	297	532
Lorenson	72	211	193
Preisler	54	283	190
Seifert	50	251	402
Evenson	34	256	652
Average	70	271	287

Beef pastures

(from preceding page)

when tall, growing plants remain after grazing. Clipping lets desirable species receive light and recover, controls weeds and spreads cattle droppings.

Determine pasture needs and fit your pastures together to provide sufficient pasture from spring to fall, Martin advises. But, if you have sufficient land to carry your cow herd, check animal performance from your pastures. If you have excellent weaning weights and cows go into winter in good flesh, you don't need to improve pasture productivity, he adds.

If you need more forage, consider your options, Hasbargen advises. In some cases, you may be able to get additional pasture cheaper by renting pasture. "Pasture rents have been quite low. If you can rent more pasture, it often is a cheaper pasture source than improving your own land," he says. However, a big gain from pasture improvement can come if the acres saved can be used to grow sunflowers, bluegrass seed and/or some other good cash crop.

But your only alternative may be to improve the pasture you have if you need more forage. Homer Kenner's records from

the beef demonstration project are an example. His added costs for improved pasture were \$17.63 per animal unit month for the demonstration pasture system of fertilized bluegrass and birdsfoot trefoil, and \$18.23 per animal unit month for the fertilized brome grass and alfalfa-grass system.

If you take the average month pasture rents per animal unit of \$3 to \$4 for his area (northwest Minnesota), they look cheap by comparison.

"But there's no more pasture available for rent in my area," Kenner says. "There's still some vacant land around, but it doesn't have fencing and water. You'd have to put some money into developing it. The only way to come out by renting land that needed development would be to get a long-term lease," Kenner says.

Disterhaupt is in the same situation as Kenner—the only practical way to increase his forage production was through pasture improvement.

"Land around here is hard to come by, whether you want to rent it or buy it," says Kenner. "Pasture improvement is a paying proposition if you need more pasture. If you have a lot of land and don't need more pasture, then pasture improvement won't pay. But if you're short of forage, a pasture improvement pro-

gram is the only way to go," he adds.

Disterhaupt increased his cow herd from 70 to 150 by improving his forage production system. However, he says an intensive pasture renovation system may **not** be the best place to start.

"If you need more pasture, the first practical step would be to put in cross fences and do rotation grazing **before** you start a complete pasture renovation system. The equipment and fuel required for renovating pasture land are very expensive, although it should pay off in the long run," states Disterhaupt.

Economic impact

If all ranchers in Minnesota's 38 northern counties adopted the management practices demonstrated in the five-year project, it could mean an extra \$3,300 in average net income per farm. This assumes 100% adoption of all management practices and reducing land requirements per cow from six to three acres.

Hasbargen figures increased income from the calf crop could come to \$1,171 per farm. Increased income from growing hay, sunflowers and wheat on land no longer needed for the beef cow herd could generate

\$2,131 in net income per farm.

The net income effect for all northern Minnesota beef producers could add up to \$29.6 million. And, using a "multiplier" to calculate benefits to the entire economy, gives a total of \$332.9 million in added economic activity to northern Minnesota.

Gerry Sullivan, area extension agent who worked with the beef demonstration project, said beef producers who cooperated in the project were picked to be representative of those in various parts of northern Minnesota.

Sullivan says the project was an interesting one, since rancher-cooperators had the benefit of advice from many university extension specialists. At least a dozen specialists in agronomy, animal science, agricultural economics, agricultural engineering, entomology and soils worked on the program.

Funding for the University of Minnesota project was through the Upper Great Lakes Regional Commission. Cooperators were: Eddie Disterhaupt, Moose Lake; Kurt Lorensen, Pine River; Loren Seifert, Pelican Rapids; Homer Kenner, Wannaska; Ollie Moe, Solway; Buddy Savich, Effie; Tom Evenson, Effie and Franklin Preisler, Bejou.