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An Economic Comparison of Rotational Grazing Systems to Eight Crop Alternatives and the CRP Option for Highly Erodible Land in Southwest Iowa

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Abstract
Economic comparisons of income on highly erodible land (HEL) in Adams County were made utilizing five years of grazing data collected from a 13- paddock intensive-rotational grazing system and a four-paddock rotational-grazing system and four years of data collected from an 18-paddock intensive-rotational grazing system, all at the Adams County CRP Research and Demonstration Farm near Corning. Net income from the average grazing weight-gain of Angus-sired calves nursing crossbred cows was compared to the net income from grazing yearling steers, to the net income of eight NRCS-recommended crop rotations, and to the Conservation Reserve Program (CRP) option. Results of these comparisons show the 13-paddock intensive rotational grazing system with cow-calf pairs to be the most profitable alternative, with a net return of $19.86 per acre per year. The second most profitable alternative is the CRP option, with a net return of $13.09 per acre, and the third most profitable option is the fourpaddock rotation with cows and calves with a net return of $12.53 per acre. An 18-paddock system returned a net income of $2.47 per acre per year with cows and calves in 1993, but lost an average of $107.69 per acre each year in 1994 and 1995 with yearling steers. Each year, the steers were purchased high and sold low, contributing to the large loss per acre. The following recommended crop rotations all show net losses on these 9-14 % slope, Adair-Shelby Complex soils (ApD3): continuous corn; corn-soybean rotation; corn-soybean rotation with a farm program deficiency payment; corn-corn-corn-oats-meadow-meadow rotation with grass headlands; continuous corn to "T" with grass headlands and buffer strips; continuous corn to "T" with grass headlands, buffer strips, and a deficiency payment; corn-corn-oats-meadow rotation to "T"; and corn-soybeans-oats-meadow-meadow-meadow-meadow rotation to "T". Per-acre yield assumptions of 90 bushels for corn, 30 bushels for soybeans, 45 bushels for oats, and four tons for alfalfa were used, with per-bushel prices of $2.40 on corn, $5.50 on soybeans, and $1.50 on oats. Alfalfa hay was priced at $40.00 per ton and grass hay at $33.33 per ton. The calf weight-gain in the cow/ calf systems was valued at $.90 per pound. All crop expenses except land costs were calculated from ISU publication Fm 1712, "Estimated Costs of Crop Production in Iowa - 1995." Land costs were determined by using an opportunity cost and actual property tax figures for the land at the grazing site. In preparation for the end of the CRP beginning in 1996, further economic comparisons will be made after additional grazing seasons and data collection. This project is an interagency cooperative effort sponsored by the Southern Iowa Forage and Livestock Committee which has special permission from the USDA Farm Service Agency (FSA) to use CRP land for research and demonstration.

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Summary

Economic comparisons of income on highly erodible land (HEL) in Adams County were made utilizing five years of grazing data collected from a 13- paddock intensive-rotational grazing system and a four-paddock rotational-grazing system and four years of data collected from an 18-paddock intensive-rotational grazing system, all at the Adams County CRP Research and Demonstration Farm near Corning. Net income from the average grazing weight-gain of Angus-sired calves nursing crossbred cows was compared to the net income from grazing yearling steers, to the net income of eight NRCS-recommended crop rotations, and to the Conservation Reserve Program (CRP) option.

Results of these comparisons show the 13-paddock intensive rotational grazing system with cow-calf pairs to be the most profitable alternative, with a net return of $19.86 per acre per year. The second most profitable alternative is the CRP option, with a net return of $13.09 per acre, and the third most profitable option is the four-paddock rotation with cows and calves with a net return of $12.53 per acre. An 18-paddock system returned a net income of $2.47 per acre per year with cows and calves in 1993, but lost an average of $107.69 per acre each year in 1994 and 1995 with yearling steers. Each year, the steers were purchased high and sold low, contributing to the large loss per acre.

The following recommended crop rotations all show net losses on these 9-14 % slope, Adair-Shelby Complex soils (ApD3): continuous corn; corn-soybean rotation; corn-soybean rotation with a farm program deficiency payment; corn-corn-corn-oats-meadow-meadow rotation with grass headlands; continuous corn to "T" with grass headlands and buffer strips; continuous corn to "T" with grass headlands, buffer strips, and a deficiency payment; corn-corn-oats-meadow rotation to "T"; and corn-soybeans-oats-meadow-meadow-meadow-meadow rotation to "T". Per-acre yield assumptions of 90 bushels for corn, 30 bushels for soybeans, 45 bushels for oats, and four tons for alfalfa were used, with per-bushel prices of $2.40 on corn, $5.50 on soybeans, and $1.50 on oats. Alfalfa hay was priced at $40.00 per ton and grass hay at $33.33 per ton. The calf weight-gain in the cow/calf systems was valued at $.90 per pound.

All crop expenses except land costs were calculated from ISU publication Fm 1712, "Estimated Costs of Crop Production in Iowa - 1995." Land costs were determined by using an opportunity cost and actual property tax figures for the land at the grazing site.

In preparation for the end of the CRP beginning in 1996, further economic comparisons will be made after additional grazing seasons and data collection.

This project is an interagency cooperative effort sponsored by the Southern Iowa Forage and Livestock Committee which has special permission from the USDA Farm Service Agency (FSA) to use CRP land for research and demonstration.

Introduction

The purpose of the Adams County Conservation Reserve Program "Grazing Demonstration" project is to show the production potential of highly erodible land (HEL) under three well-managed livestock grazing systems and to compare the economics of these systems with other possible crop rotations on this land.

To assess the viability of these alternative uses, a comparison is made between the actual production information from three grazing systems and various other land resource uses that could be practiced when the Conservation Reserve Program (CRP) ends. The alternative uses are as follows: continuous corn; corn-soybean rotation; corn-soybean rotation with a feed-grain program deficiency payment and including grass headlands; corn-corn-corn-oats-meadow-meadow rotation including grass headlands; continuous corn to with soil loss limited to "T" containing grass headlands and buffer strips; continuous corn rotation to "T" with a deficiency payment and containing grass headlands and buffer strips; corn-corn-oats-meadow rotation to "T"; and corn-soybean-oats-meadow-meadow-meadow-meadow rotation to "T". All corn and soybeans are assumed to be planted no-till.

This report summarizes five years of these economic comparisons.

Materials and Methods

The Adams County CRP Research and Demonstration project is located in section 23 of Quincy Township in Adams County, Iowa. The predominant soil type for the 122-acre grazing project is an Adair-Shelby complex with a slope of 9%-14% with an erosion factor of 3 (ApD3). The CSR for this soil type is 25 with NRCS yield predictions as follows: corn, 90 bushels per acre; soybeans, 30 bushels per acre; and oats, 40 bushels per acre.

This parcel of land was selected because of its availability, its similarity to other CRP land in Adams County, and its readily accessible water for livestock. Five man-made ponds exist within this 122-acre area. Some of the grazing project area was seeded with various grasses and grass/legume mixtures upon entering the CRP program in 1987. Other areas were seeded prior to initiation of the CRP.

The demonstration is divided into three grazing systems: an intensive rotational system containing 13 paddocks on 34.6 acres and a more traditional four-paddock rotation grazing system on 22.4 acres, both established in 1991; and an 18-paddock intensive rotational grazing system established in 1992.

Before the grazing study began, soil tests were taken, and fertilizer was applied as indicated by these soil tests. Results from the tests showed some areas to have a low pH and low to very low phosphorus (P) level. Each year since then, the paddocks have been retested and fertilizer applied as needed. These fertilizer costs are reflected in the crop input costs of each of the grazing alternatives in Table 5.

In the spring of 1991, the grazing area in the 13-and 4-paddock systems were fenced using 12.5-gauge, high-tensile electric fence. The central focus of the paddock system's design was a contoured 20-foot wide alley with paddocks on either side (Figure 1). Between the two systems, a five-wire, 200' x 200' electrified training/holding pen was built. Within this training pen, a portable corral was used for weighing and working cattle. The 18-paddock system also was fenced using 12.5-gauge, high-tensile electric fence, and it also utilizes contour alleys between paddocks and has it's own electrified training/holding pen (Figure 2).

Cows and calves are brought to the CRP farm about May 1 each spring after calving and removed about October 1. They are weighed at the beginning and the end the grazing period each year and at 30-day intervals throughout the summer.

Figure 1. Map of Adams County CRP Project. 13- and 4-paddock grazing systems.

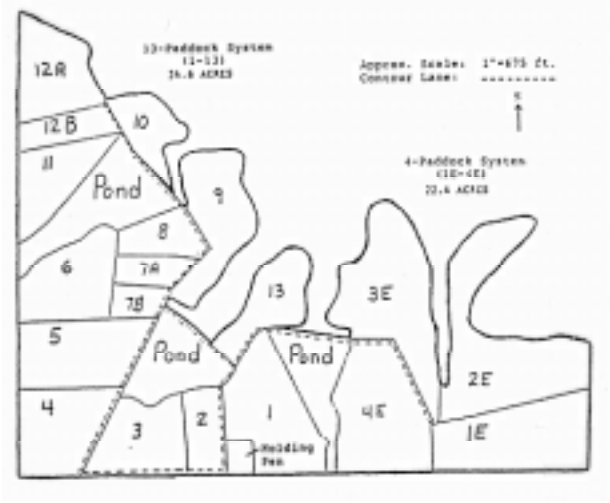

Figure 2. Map of Adams County CRP Project. 18-paddock grazing system.

Thirty-four cow-calf pairs were transported to the CRP grazing site from ISU's Rhodes Research Farm on April 28, 1995. These crossbred cows with Angus-sired calves were randomly assigned to paddocks in the 13-and 4-paddock systems after being conditioned to electric fence and grass for two days after arrival. (for additional information on the cows and calves, refer to Research Report R1354, " Rotation Grazing Demonstrations With Beef Cows on HEL - Adams County Conservation Reserve Program (CRP) Project.")

Iowa State University purchased 75 steer calves weighing an average of 527.21 pounds that began grazing the 18-paddock grazing system on May 4, 1995. These steers received no grain during the grazing period, and they were removed from the system on September 14 and sold at the Adams County Auction barn in Corning. A final weight was taken at the farm prior to removal, and that weight was used in calculations for this and other Adams County CRP Project production reports. (for further information on the steer project, refer to Research Report R1355, " Intensive Rotational Grazing of Steers on Highly Erodible Land at the Adams County CRP Project.")

Water used in the holding pen and throughout the paddocks was either pumped or gravity-fed from ponds into tanks. These tanks were located at strategic points throughout the systems.

The grazing management strategies of the three systems differ. The management strategy in the 13-and 18-paddock system was based on forage height and had a goal of not grazing more than 50% of the standing forage each grazing period. Percent forage was determined by measuring the height of grass when cattle were turned into a paddock and then remeasuring it to determine removal time. The grazing strategy on the four-paddock system was to rotate cattle to a new paddock every 10 to 14 days.

Income and expenses from the grazing studies were summarized, and these values were compared with income and expense values for the existing CRP program as well as for a series of hypothetical row-crop alternatives.

The crop rotation alternatives analyzed were those that could be incorporated into an approved NRCS conservation plan for conservation compliance. Because it is not known what the requirements will be for CRP land when it is released, rotations were chosen using several different conservation systems including four rotations that would result in soil loss reduced to the tolerable limit (T).

In many of these rotations, it was necessary to leave grass headlands and/or grass buffer strips to maintain the soil loss within acceptable limits. These required 6.5 acres and 15.6 acres, respectively, from the available cropland. No-till planting was required by all alternatives.

The income from the row-crop alternatives is based on NRCS high- management yield predictions from the predominant soil type (ApD3) for each crop. The NRCS yield and price assumptions used are summarized in the lower portion of Table 5. The yield for corn following corn was reduced 10% for each year after the first to allow for the yield reduction seen in continuous corn rotations.

Crop income was calculated as price-per-unit times yield. The deficiency payment equalled the total deficiency payment divided by the total number of acres planted.

All costs associated with crop rotations except land cost were taken from the ISU publication "Estimated Costs of Crop Production in Iowa - 1995," FM 1712, revised November 1995. The land costs were actual costs associated with the particular Adams County CRP farm.

The rotational grazing systems are summarized in Tables 1,2, 3, and 4. Calves on the 13-paddock rotational grazing system gained 2.10 pounds per day for the 1991 grazing season, 2.45 pounds per day in 1992, 2.35 in 1993, 2.37 in 1994, and 2.36 in 1995. This resulted in a four-year-average weight gain of 2.32 pounds per day, producing a five-year average of 213.4 pounds of calf gain per acre. Using a market price for calves of $90 per hundredweight , the 13-paddock system produced a five-year average per acre income of $190.30. Hay production and use were included in calculations each year, but cow weight-gain which was significant each year was not included.

The calves on the four-paddock rotational grazing system gained 2.25 pounds per day in 1991, 2.38 in 1992 and 1993, 2.50 in 1994, and 2.38 in 1995. This produced a five-year average of 210.4 pounds of calf gain per acre. Using $90. per hundredweight for the value of calf produced each year, this produced a five-year average per acre income of $186.69. Again, hay production and use each year were recorded and used in the economic calculations, but cow weight-gain, although significant, was not included.

The 18-paddock system produced calf gains of 2.38 pounds per day and 2.33 pounds per day in 1992 and 1993, respectively. The two-year average gain was 2.35 pounds per day for an average calf gain of 158.18 pounds per acre. Pricing this gain at $90. per hundredweight results in a gross income per acre of $142.37. In 1992, this system produced 37 bales of hay, 19 of which were fed to the cattle in the system. No hay was produced from this system in 1993, but 11 bales of hay were fed. The average of the two years resulted in excess hay production of 3.5 bales. This production was priced at $33.33 per ton and resulted in additional income for this system of $2.38 per acre.

In 1994 and 1995, stocker steers were grazed on the 18-paddock system. This was an alternative enterprise from the cows and calves of the two previous years and might be a more lucrative option for some CRP owners. Management of the steers in 1995 allowed the entire lot of yearling steers to remain on the system for 133 days, while management in 1994 grazed 74 steers for 88 days and then removed 40 of the biggest steers and grazed the 34 remaining steers for another 100 days.

Expenses shown in Table 5 for the 13-paddock, 4-paddock, and 18-paddock grazing systems are based on the actual costs of establishing and operating each system. The total cost of the fence material was $3,261.78 for the 13-paddock system, $1,950.45 for the four-paddock system, and $5048.28 for the 18-paddock system. These costs have been spread over the 20-year life expectancy of the fence. From this total, the interest expense was calculated using a 10% rate. Also, a maintenance cost of 6% was used. Water systems, mineral feeders, and cow costs also have been amortized over their expected useful lives.

The $70 per acre CRP income shown in Table 5 is the actual bid for this area. The expenses shown are typical expenses incurred for establishing and maintaining the weed-free grass stand required by the CRP contract. The cost of the initial seeding is amortized over the 10-year life of the CRP contract, and other expenses include spraying and mowing for broadleaf weed control.

The land in this demonstration has been valued at $400.00 per acre. An opportunity interest charge of 10% was used to determine a yearly land charge. Therefore, each alternative rotation contains a land cost of $40.00 per acre.

The real estate tax is based on actual figures for this 122-acre tract of land. This figure has been calculated at $5.29 per acre and is used for each rotation.

Results and Discussion

Analysis of five years of grazing data from the Adams County CRP Project demonstration site utilizing a standard set of price and yield assumptions show that the 13- and 4-paddock grazing systems on these soil types have a greater net return than any cropping system recommended by NRCS for conservation compliance. The 18-paddock system with cows and calves showed a positive net return for the 1992 and 1993 grazing seasons but showed a large loss in 1994 and 1995 with steers. These comparisons are summarized in Table 5 and illustrated in Figure 3. The 13-paddock grazing system option also exceeded the CRP option in which the land is currently enrolled.

The 13-paddock rotational grazing system with cows and calves resulted in the greatest five-year average net income per acre planted, at $19.86 per acre. The four-paddock system returned $12.53 per acre, and in two years, the 18-paddock system returned $2.47 per acre with cows and calves. The 13-paddock system includes additional expenses associated with a solar-powered water system, which decreases possible net income. This water system had an initial cost of $2,615.27 and added $17.38 per acre per year to expenses.

Results of the steer grazing in the summer of 1994 on the 18-paddock system yielded gains of 1.82 pounds per head per day from a co-mingled group of salebarn-steers for a long 188-day grazing season. In 1995, similar steers gained only 1.14 pounds per head per day for 133 days. In both years, using comparison purchase costs and actual sale prices, the steers lost a lot of money. This reminds both the researchers and the reader that the overriding factors for profit in a grazing enterprise with purchased cattle are price at purchase time and price at sale time. The Adams County CRP steer project in 1994 and 1995 operated under the very restrictive parameters of purchasing the steers in the late winter or early spring and then selling them at the end of the grazing season. These parameters resulted in buying extremely high and then selling low. The good grazing gains in 1994 and the mediocre gains in 1995 simply could not overcome the losses from the decline in the cattle market and create a profit for this enterprise. Had the researchers had the option of grazing their own raised steers or putting steers in a feedlot, or buying at a lower time, such losses might not have occurred. The steer-grazing trial will be repeated in 1996 to gather further intensive-rotational grazing steer data.

The second most profitable option from the comparisons in Adams County is the CRP option, with a net income of $13.09 per acre. This option also has the least risk connected with it, but when all the expenses are subtracted from the income, the return is not as great as it might first appear. Furthermore, the CRP option may not be available in the future.

All the rotational cropping systems in these economic comparisons resulted in net losses. Losses ranged from -$54.30 per acre with the corn, soybean, oats, meadow, meadow, meadow, meadow rotation with soil loss restricted to "T," to -$4.54. with a corn-soybean rotation and participation in the USDA feed-grain program. In previous years of comparisons, the corn-soybean rotation with deficiency payments had shown a small profit, but with the increased expenses for row crops shown in the 1994 and 1995 editions of ISU publication Fm 1712, "Estimated Costs of Crop Production in Iowa," and the reduced deficiency payments, the profit for row-crops on this type of land was eliminated.

The deficiency payment calculated for these comparisons is site-specific. In the analysis, the payment has been calculated by the Farm Service Agency (FSA) based on the south 57-acre tract of land and is based on a 29-acre corn base. Deficiency payments will vary from farm to farm depending on the corn base and may change feed-grain program payments to result in a greater loss or profit depending on the parcel of land and the corn base assigned to it.

The crop rotation resulting in the greatest economic loss per acre was the CBOMMMM to "T" rotation (Table 5 and Figure 3), losing $54.30 per gross acre per year. This rotation has shown a loss each year for the last five years with the economic comparisons from the Adams County CRP Project; however, the losses in the CBOMMMM rotation have always been out-distanced before by the losses with continuous corn. In the 1995 comparisons, the additional machinery and production costs of putting up hay denoted in the 1995 version of Fm 1712 along with the low yields on these soils and the standard hay price over the years of $40.00 per ton have pushed this option to the bottom of the profitability ladder. It is interesting to note that the continous corn options without the USDA feedgrain program also lost more than $50.00 per acre in 1995. The crop options with the least losses were the corn-soybean rotations, losing $4.54 and $8.16 per gross acre.

The authors believe that many farmers plan to go back to a crop rotation rather than leave their land seeded to grass when CRP contracts expire. Choosing the correct rotation will make the difference between profit and loss in their

operations on this type of HEL. In this economic analysis, the grazing rotations with cows and calves show a greater net return per acre than any of the crop rotations. Steer grazing, after two years of data, shows the biggest loss. However, uniform price and yield parameters were used each year in these comparisons up to this point. A very different set of parameters existed in Iowa agriculture in the late fall and winter of 1995. Cattle prices dropped to the lowest levels in 10 years and grain and hay prices increased to the highest levels in at least a decade. The grain and livestock price picture in southwest Iowa would include corn at $3.25 per bushel, soybeans at $6.50 per bushel, hay at $55.00 per ton, and feeder calves at $66. per hundredweight. If a second computer run of the economic comparisons was made using these new 1995 parameters, the authors believe that because of delayed planting due to continual rains in the spring, and low final yields in southwest Iowa, that crop yield parameters on these highly-erodible marginal soils would have to be adjusted downward as well. The final 1995 yield data is not in at the time of this writing and the comparison of yield reductions from forage crops or row crops following the wet conditions adds yet another dimension to the dilemma of changing parameters. It is believed that economic comparisons with the speculated adjustments would show very little (crop or livestock) farming activity to be profitable on HEL in 1995. After a great deal of discussion about these price changes, the authors chose to stay with the longer term average prices used in previous years for this report. However, given more years of this current price structure in agriculture, it becomes obvious that a new set of price parameters may need to be developed.

Intensive rotational grazing technology can add profit to HEL. It is relatively new technology to the farmers of southwest Iowa, and whether it is adopted as an option for CRP land before the end of the CRP program remains to be seen. The initial costs of system layout and the amount of commitment of each individual to grass and grassland/ livestock management remain as keys to this adoption. Nineteen ninety-five and its different commodity prices may have presented even more obstacles to keeping this land in grass. It is the intent of the Adams County CRP project to continue collecting data and reviewing similar comparisons after each new growing season to continue to search for economically feasible and environmentally sound alternatives for highly erodible land included in CRP.

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Table 1. 13 Paddock System Production Data, May 2 to September 23, 1993.□

	1991	1992	1993	3 Year Ave.
Initial Calf Weight			142.4*	
Final Calf Weight			481.21*	
Initial Cow Weight			1145.67	
Final Cow Weight			1159.05	
System Acres	34.6	34.6	34.6	34.60
Number of Cow/Calf Pairs	23	22	21	22.00
Stocking Rate	.66	.64	.61	.64
Acres/Cow/Calf Pair	1.50	1.57	1.65	1.57
Days Grazed	134	155	144	144.33
Calf ADG	2.1	2.44	2.35	2.30
Ave. Total Gain/Calf	280.9	380.5	338.81	333.40
Calf Gain/Acre	186.73	241.94	205.64	211.43
Cow Weight Gain/Loss	72	76.9	13.38	54.09
Cow Cond. Score Change	0	.4	.33	.24
Hay Production	9	9	0	6.00
Hay Fed	8	16	9	11.00
Net Hay Usage	1	-7	-9	-5.00

*adjusted calf weight

□ Cows were grazed on the system until October 12. This required 3 more bales of hay and yielded 20 more grazing days.

Table 2. Four Paddock System Production Data,May 2 to September 23, 1993.

	1991	1992	1993	3 Year Ave.
Initial Calf Weight			138.62*	
Final Calf Weight			481.28*	
Initial Cow Weight			1155	
Final Cow Weight			1191.54	
System Acres	22.4	22.4	22.4	22.40
Number of Cow/Calf Pairs	12	16	13	13.67
Stocking Rate	.54	.71	.58	.61
Acres/Cow/Calf Pair	1.87	1.40	1.72	1.66
Days Grazed	134	154	144	144.00
Calf ADG	2.25	2.38	2.38	2.34
Ave. Total Gain/Calf	301.4	369.1	342.66	337.72
Calf Gain/Acre	161.46	263.64	199	207.99
Cow Weight Gain/Loss	50	82.1	36.54	56.21
Cow Cond. Score Change	-.1	.4	.46	.25
Hay Production	11	3	0	4.67
Hay Fed	0	14	7	7.00
Net Hay Usage	11	-11	-7	-2.33

*adjusted calf weight

☐ Cows were grazed on the system until October 12. This required 3 more bales of hay and yielded 20 more grazing days.

Table 3. 18 Paddock System Production Data, May 14 to September 23, 1993

	1992	1993	2 Year Ave.
Initial Calf Weight		129.05*	
Final Calf Weight		433.81*	
Initial Cow Weight		1184.3	
Final Cow Weight		1187.47	
System Acres	55.2	65	60.10
Number of Cow/Calf Pairs	26	32	29.00
Stocking Rate	.47	.49	.48
Acres/Cow/Calf Pair	2.12	2.03	2.08
Days Grazed	147	132	139.50
Calf ADG	2.38	2.33	2.35
Ave. Total Gain/Calf	350.5	307.28	328.89
Calf Gain/Acre	165.09	151.28	158.18
Cow Weight Gain/Loss	38.2	3.17	20.69
Cow Cond. Score Change	0	.41	.20
Hay Production	37	0	18.50
Hay Fed	19	11	15.00
Net Hay Usage	18	-11	3.50

*adjusted calf weight

☐ Cows were grazed on the system until October 12. This required 3 more bales of hay and yielded 20 more grazing days.

Table 4. 18-paddock system performance comparisons between 1994 and 1995. Stoer steers.

Item	1994	1995
Date Grazing Started	Apri. 29, 1994	May 4, 1995
Date Grazing Ended	November 3, 1994	September 14, 1995
Number of Days Grazed	188	133
Animal Days of Grazing	9912	9975
Animal Days of Grazing per Acre	152.5	153.5
Stocking Rate, Steers per Acre	0.81	1.15
Average Beginning Weight	488.2	495.7
Average Ending Weight	731.5	647.7
Total Gain	18003	11403
Average Daily Gain per Head	1.82	1.14
Pounds of Gain per Acre	277	175

Table 5. Income and expenses for cropping alternatives on HEL in Adams County (1991-1995).

	CRP	10 Paddock Rotation 5 Year Avg.	4 Paddock Rotation 5 Year Avg.	18 Paddock Rotate. Cow 2 Year Avg.	18 Paddock Rotate. Steer 2 Year Avg.	Continuous Corn w/GH	C-B Rot. w/ GH	C-B Rot. w/ Def. & GH	CCCCMM Alt. w/GH	CC No-till T w/GH & BS	CC-Def.T w/GH & BS	CCCM..T w/GH	CBCMMMM.T w/GH
INCOME													
Crop & livestock	$70.00	$190.30	$186.69	$142.37	$557.75	$182.25	$180.00	$154.62	$174.50	$182.25	$108.07	$176.19	$165.71
Hay		($0.40)	($0.98)	$2.38	$1.70	$0.00	$0.00		$11.25	$0.00		$16.88	$9.64
Def. pmt.								$14.02			$14.02		
Total income/acre	$70.00	$189.90	$185.71	$144.75	$559.45	$182.25	$180.00	$168.64	$185.75	$182.25	$122.09	$193.07	$175.35
EXPENSES													
1. Preharvest mach.	$2.72	$1.50	$3.10	$0.85	$0.85	$17.80	$15.09	$13.04	$27.85	$17.80	$10.13	$25.42	$34.15
2. Crop inputs	$5.90	$26.67	$27.19	$26.98	$40.70	$112.37	$85.49	$73.67	$84.43	$112.37	$63.50	$90.49	$64.94
3. Harvest mach.	$0.00	$0.00	$0.00	$0.00	$0.00	$44.70	$35.74	$31.37	$52.69	$44.70	$24.49	$52.86	$54.77
4. Labor	$3.00	$29.70	$33.72	$24.60	$23.55	$20.40	$16.80	$14.35	$23.11	$20.40	$11.38	$22.28	$23.59
5. Land & real est. taxes	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29	$45.29
6. Livestock costs	$0.00	$66.88	$63.88	$44.56	$556.75	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total fixed and var. costs	$56.91	$170.04	$173.18	$142.28	$667.14	$240.56	$198.41	$177.72	$233.37	$240.56	$154.79	$236.34	$222.74
Net income/acre planted	$13.09	$19.86	$12.53	$2.47	($107.69)	($58.31)	($18.41)	($9.08)	($47.62)	($58.31)	($32.70)	($43.27)	($47.39)
Net income/gross acre/ per year	$13.09	$19.86	$12.53	$2.47	($107.69)	($51.66)	($8.16)	($4.54)	($50.57)	($35.70)	($32.71)	($40.50)	($54.30)

Price & Yield Assumptions		
	Price	SCS Yield
Corn, bu	$2.40	90
Soybeans, bu	$5.50	30
Oats, bu	$1.50	45
Alfalfa, ton	$40.00	4
Feeder cattle, cwt	$0.90	NA
Grass hay, ton	$33.33	NA

B - Soybeans
C - Corn
M - Meadow
O - Oats
T - Soil loss tolerance
Alt. - Alternative soil loss calculations

Def. - Deficiency payment
BS - Buffer strip
GH - Grass headlands
CC - Continuous corn
Rot. - Rotation

Figure 3. Net income per acre on HEL in Adams County (1991-1995).