



Adams County CRP Research and Demonstration Project

SUMMARY

The Adams County CRP project focuses on earning “production-generated” income while preventing soil loss on highly erodible land.

The Adams County CRP Research and Demonstration Project near Corning, Iowa, was initiated in 1989. It focuses on the problem of earning “production-generated” income from highly erodible land (HEL) now enrolled in the 10-year Conservation Reserve Program (CRP), while limiting soil loss to Soil Conservation Service (SCS) conservation compliance tolerance levels.

Forage Improvement

From 1990 to 1993, forage improvement studies and demonstrations were initiated in small plots on steeply-sloping, highly erodible Adair-Shelby complex soils in Adams County. The plots include no-till interseedings of grasses and legumes, forage establishment methods, and warm season grass establishment methods. Successful interseedings were accomplished in early spring with birdsfoot trefoil, medium red clover, lespedeza, creeping alfalfa, crown vetch, alsike clover, orchardgrass, and smooth brome grass. Birdsfoot trefoil and red clover are now being interseeded into paddocks in the grazed areas. Variable success was observed with ladino clover, reed canarygrass, switchgrass, big bluestem, little bluestem, Indiangrass, and eastern gamagrass. Currently, yield measurements are being taken to establish productivity expectations on these steep and poorly-drained sidehills.

Grazing Systems

In 1991, the animal component was added to studies by establishing four-paddock and 13-paddock contoured-lane grazing systems. In 1992, a third 65-acre, 18-paddock contoured-lane, intensive rotational grazing system was established. This system includes a unique warm season grass/legume component.

All three grazing systems started with the existing grass stands which included smooth brome grass, tall fescue, orchardgrass, Kentucky bluegrass, and other minor grass species. Legumes are being added to these stands through interseeding and frost-seeding as part of the planned forage improvement program.

All systems are fenced with 12.5-gauge, high-tensile electric fence, and use high-voltage, low-impedance power units. The central contoured lanes, a unique feature of the Adams County grazing systems, prevent gully formation from cattle paths (figures 1 and 2).

Paddock size and shape in the 13- and 18-paddock systems was determined by the landscape and the amount of forage that could be produced allowing for an average 30-day rest period between grazings. The maximum stocking rate was projected to be 1.5 acres per cow-calf pair. This led to establishing paddocks ranging in size from 1.5 to 4 acres on the 13-paddock system and 2 to 5.7 acres on the 18-paddock system. Some paddocks are additionally subdivided each year with portable electric fence for better grass usage.

Paddock size in the four-paddock system was determined by dividing the land area by four and then adjusting for the landscape. Paddocks range from 4.7 acres to 6.6 acres, with no further subdivisions made in this system during grazing.

Fertility management includes soil samples each spring with fertilizer applications of lime, phosphorus, and potassium based upon sample findings. Nitrogen fertilizer is applied sparingly and in accordance with Iowa State University recommendations for grass and legume-grass pastures.

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Grazing management in the 13- and 18-paddock systems is based on forage height, with the goal of not grazing more than 50 percent of the standing forage in each paddock. This requires moving the cattle every one to seven days, depending on grass growth rate and hay feeding. Forage height is measured with a yardstick as cows and calves are turned into a paddock and then remeasured as they are removed.

Grazing management in the four-paddock system involves rotating the cattle to a new paddock every 10 to 14 days.

Results

Results from the 13-paddock system with an average of 22 cow-calf pairs on 34.6 acres in 1991, 1992, and 1993 show a three-year average of 211.4 pounds of calf-gain produced per acre per year in an average 144-day grazing season. This is a calf average daily gain of 2.30 pounds on grass with no creep feed. Cows also gained an average of 54.1 pounds and increased in condition score by .2.

Similar gains were produced with an average of 13.7 cow-calf pairs on the four-paddock

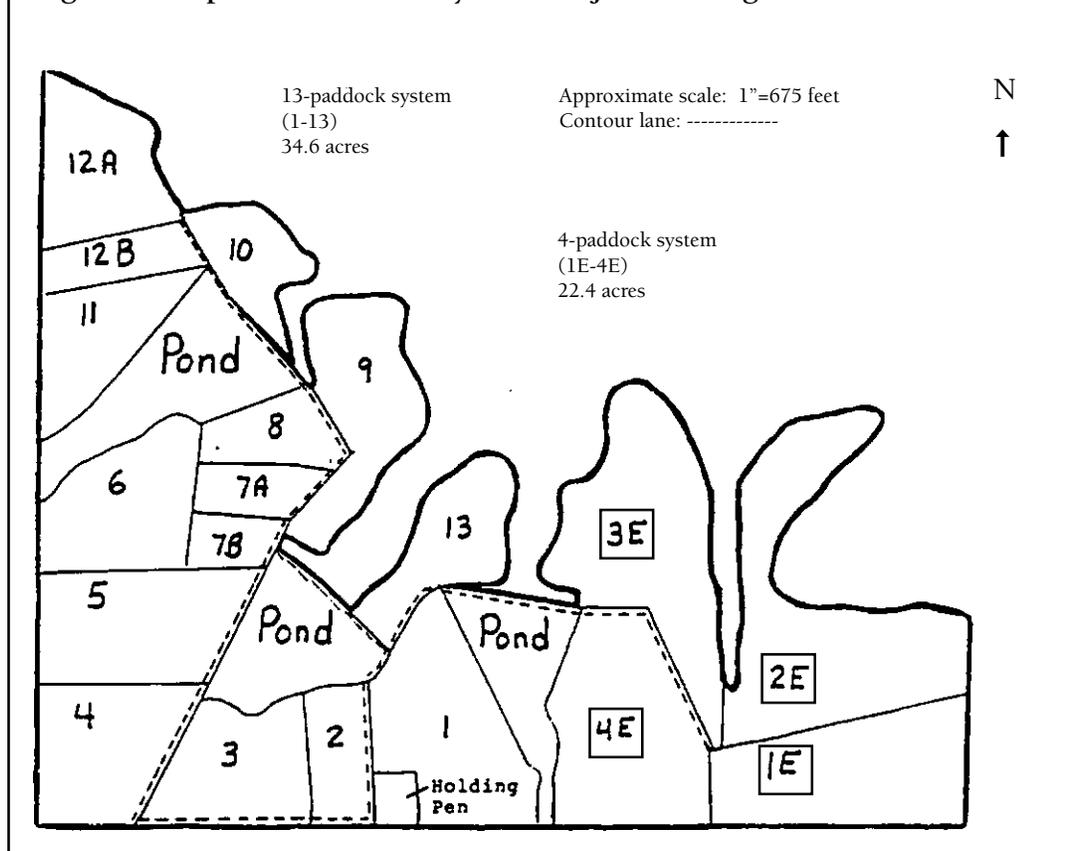
system. In the same 144-day average grazing season, calves gained 2.34 pounds per day with no creep feed and produced 208 pounds of calf gain per acre. Cow weight gain averaged 56.2 pounds and condition score increased by .3 for each cow.

Production on the 18-paddock system with cow-calf pairs in 1992 and 1993 was less than on the other two systems at 158.2 pounds of calf-gain per acre per year. This lower production level was attributed to the newer, less well established stands of grass and the resulting lower stocking rates. Cows gained weight and increased in condition score on this system, also.

Steer Grazing

Seventy-four crossbred steers were grazed in 1994 on the 65-acre 18-paddock system. They were purchased at southern Iowa sale barns in February and began an intensive rotational grazing test on April 29, 1994, weighing 488 pounds on average. On July 26, 1994, 40 of the heaviest steers were removed from the study and sold. Average weight of these steers was 702 pounds with an average gain for the 88 days of 2.00 pounds per animal per day.

Figure 1. Map of Adams County CRP Project Grazing Demonstration



Preliminary results showed the remaining 34 steers to weigh an average of 754 pounds on October 12, 1994, and to have gained 1.87 pounds per head per day for 166 days. These gains are actual on-the-farm gains and do not reflect “pay-to-pay” performance of the animals. Final 1994 gains and an economic summary of intensive rotational grazing steers at the CRP farm near Corning will be published in the 1995 ISU Beef and Sheep Research report.

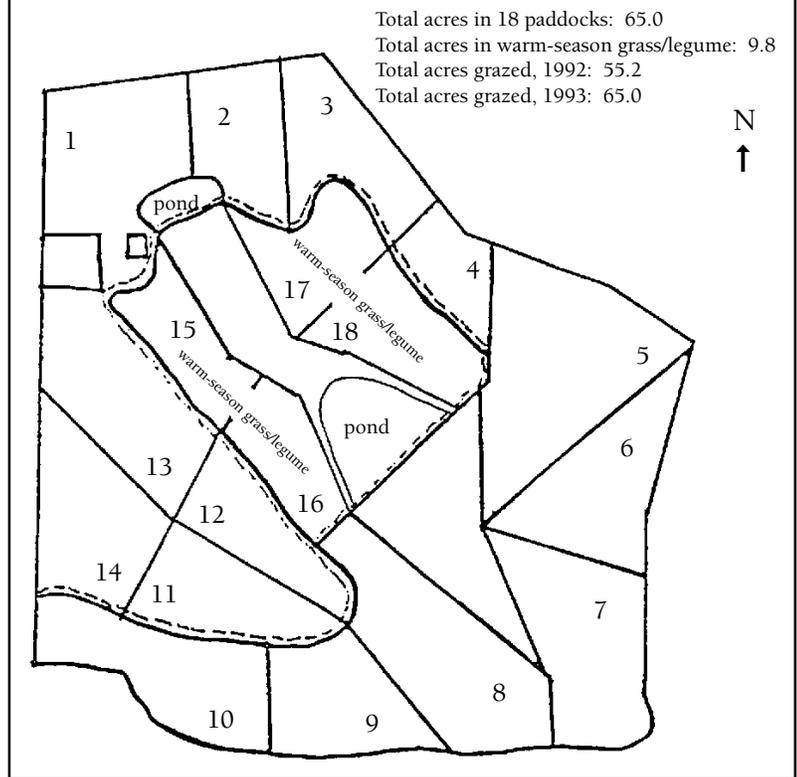
Income Comparison

An economic comparison of income on HEL in Adams County was made using three years of rotation grazing data collected at the Adams County CRP farm, eight SCS recommended crop rotations, and a continuation of the CRP option. (See table 1.) Results from these comparisons show the 13-paddock intensive rotational grazing system to be the most profitable alternative with a net return of \$26.95 per acre per year. The next most profitable alternative was the four-paddock rotational grazing system with a net income of \$19.21 per acre per year. The third most profitable system was the CRP option with a net return of \$13.09 per acre. The 18-paddock system returned a net income of \$2.48 per acre per year.

The following crop rotations all show net losses on these 9-14 percent slope Adair-Shelby complex soils: continuous corn; corn-soybean; corn-corn-oats-meadow-meadow 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 to “T”; and corn-soybeans-oats-meadow-meadow-meadow-meadow 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. The crop rotation of corn-soybeans with a deficiency payment and grass headlands was the only crop rotation to show a profit with a return of \$.94 per acre.

All crop expenses except land costs were calculated from Iowa State University Extension publication Fm-1712, *Estimated Costs of Crop Production in Iowa—1992*. Land costs were determined using an opportunity cost and actual property tax figures for the land at the grazing site.

Figure 2. The 18-Paddock Grazing System



Survey and Database

In addition to the grazing systems and economic comparisons, a CRP contract survey and database from 300 CRP contracts in Adams, Taylor, and Ringgold counties have been developed. In on-site visits, SCS-trained technicians collected information about physical limitations to grazing CRP land when the CRP program ends. Preliminary results show that 75 percent of the CRP land surveyed has questionable water supplies for grazing livestock. Also 74 percent of the fencing rated only average at best and 36 percent was considered poor. In general, the condition of the forage was good with 86 percent of the observations rating the ground 80 percent or more covered with good grasses and legumes.

For more information on research and demonstrations at the Adams County CRP Research and Demonstration Project, contact Adams County ISU Extension, 603 7th Street, Corning, Iowa 50841, telephone or FAX (515) 322-3184.

Table 1. Income and Expenses for Cropping Alternatives on HEL in Adams County*

	CRP	13 Paddock Rotation 3 Year Ave.	4 Paddock Rotation 3 Year Ave.	18 Paddock Rotation 2 Year Ave.	Continuous Corn Alt. w/GH	C-B Rot. Alt. w/ GH
Income						
Crop & livestock	\$70.00	\$190.37	\$187.08	\$142.37	\$194.40	\$190.50
Hay		(\$2.79)	(\$1.26)	\$2.38	\$0.00	
Total income/acre	\$70.00	\$187.58	\$185.82	\$144.75	\$194.40	\$190.50
Expenses						
1. Preharvest machinery	\$2.72	\$1.50	\$3.10	\$0.85	\$19.48	\$21.21
2. Crop inputs	\$5.90	\$24.69	\$25.08	\$26.98	\$100.98	\$78.14
3. Harvest machinery	\$0.00	\$0.00	\$0.00	\$0.00	\$41.00	\$32.33
4. Labor	\$3.00	\$27.31	\$34.01	\$24.60	\$20.40	\$16.80
5. Land & real est. taxes	\$45.29	\$45.29	\$45.29	\$45.29	\$45.29	\$45.29
6. Livestock costs	\$0.00	\$61.84	\$59.13	\$44.55	\$0.00	\$0.00
Total fixed & var. costs	\$56.91	\$160.63	\$166.61	\$142.27	\$227.15	\$193.77
Net income/acre planted	\$13.09	\$26.95	\$19.21	\$2.48	(\$32.75)	(\$3.27)
Net income/gross acre	\$13.09	\$26.95	\$19.21	\$2.48	(\$29.02)	(\$2.91)
Income						
	C-B Rot. Alt. w/ Def. & GH	CCCOMM Alt. w/GH	CC No-till.T w/GH & BS	CC-Def.T w/GH & BS	CCOM. T w/GH	CBOMMMM.T w/GH
Crop & livestock	\$163.79	\$180.80	\$194.40	\$114.85	\$170.90	\$168.71
Hay		\$11.25			\$16.88	\$9.64
Def. Payment	\$14.02			\$14.02		
Total income/acre	\$177.81	\$192.05	\$194.40	\$128.87	\$187.78	\$178.35
Expenses						
1. Preharvest machinery	\$17.88	\$13.30	\$19.48	\$12.32	\$15.74	\$31.85
2. Crop inputs	\$67.04	\$72.76	\$100.98	\$57.33	\$65.16	\$36.17
3. Harvest machinery	\$28.28	\$58.73	\$41.00	\$22.52	\$54.09	\$66.90
4. Labor	\$14.35	\$21.78	\$20.40	\$11.81	\$20.49	\$21.91
5. Land & real est. taxes	\$45.29	\$45.29	\$45.29	\$45.29	\$45.29	\$45.29
6. Livestock costs	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total fixed & var. costs	\$172.84	\$211.86	\$227.15	\$149.27	\$200.77	\$202.12
Net income/acre planted	\$5.61	(\$19.81)	(\$32.75)	(\$31.33)	(\$13.78)	(\$23.77)
Net income/gross acre	\$4.97	(\$17.54)	(\$20.05)	(\$20.40)	(\$12.99)	(\$22.98)

*Price and yield assumptions: corn, bu. = \$2.40, SCS yield = 90; soybeans, bu. = \$5.50, SCS yield = 30; oats, bu. = \$1.50, SCS yield = 45; alfalfa, ton = \$40.00, SCS yield = 4; feeder cattle, cwt. = \$0.90; grass hay, ton = \$33.33.

This bulletin is part of a series to help CRP contract holders assess the land-use options available to them when the contracts expire. The series is funded in part by the Leopold Center for Sustainable Agriculture. Other bulletins in the series and additional information are available at county ISU Extension offices.

Adapted from ISU Animal Science leaflets R-1156 and R-1157, and other unpublished data. Prepared by Chris Nelson, Adams County ISU Extension education director; Daryl Strohhahn, ISU Extension livestock specialist; Steve Barnhart, ISU Extension agronomist; Russ BreDahl, ISU Extension beef and forage specialist; and Elaine Edwards and Laura Sternweis, ISU Extension communication specialists.

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