Economic Impacts of Post-CRP Policy Options in South Dakota

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INTRODUCTION

The Conservation Reserve Program (CRP), created in the 1985 Food Security Act, was enacted with the primary goal of removing highly erodible (HEL) and other environmentally sensitive land from crop production. Other goals included raising crop prices and controlling surplus crop production. A total of 36.4 million acres were enrolled nationally in the Conservation Reserve Program. Nearly all CRP contracts will expire between 1996 and 2002.

Land use decisions upon CRP contract expiration will have to be made on CRP land in the U.S. These decisions will affect commodity prices and production levels; especially for wheat, corn, soybean and forage production. Also, regional economic impacts of post-CRP land use decisions will likely be significant in agricultural-dependent regions with large amounts of CRP acres.

Results from national and state-level surveys of CRP contract holders and results from economic modeling of post-CRP land use decisions indicated a majority of CRP lands will likely return to crop production upon contract expiration (2,3,5,7,8,9). The CRP economic modeling study sponsored by NC-214 examined three policy scenarios: CRP termination, reduced CRP of 18-20 million acres, and full CRP of 32 - 36 million acres. Key land use results from the CRP termination (reduced CRP) policy options indicated 21.5 (13.0) million of 36.4 million CRP acres were projected to shift to production of seven major crops - wheat, corn, soybeans, sorghum, oats, barley, and cotton (9).

This report examines the major economic impacts of alternative future CRP decisions in South Dakota, an agricultural-dependent state with approximately two million acres enrolled in the CRP. Methods and results from estimating farm-level, regional, and statewide economic impacts are discussed. Important features of this South Dakota study are its: (1) linkages to a national CRP modeling study to help

estimate farm-level economic impacts, and (2) incorporating the farm-level impacts into regional economic analyses using input-output (IMPLAN) models (4).

The national CRP (NC-214) study combined the use of macroeconomic simulation models with an interregional agricultural policy simulation model to estimate national, state, and sub-state regional changes in cropland use and post-CRP land use for three policy scenarios. This modeling approach estimated farm-sector economic and land use impacts for seven major crops (9).

The South Dakota research has several linkages to the national CRP study. First, South Dakota data on productivity differences of CRP land and all cropland were supplied to the national model. Second, crop prices used in the South Dakota budgets were derived from the model's national price forecasts for the year 2000. Third, selection of post-CRP policy options to examine for South Dakota was based on the policy options included in the national CRP study. Fourth, the national model's predicted number of CRP and crop acres in each region for each policy option was used in the South Dakota research.

FARM-LEVEL ECONOMIC IMPACTS

South Dakota has an estimated 2.06 million acres, 10.5% of its cropland and 4.6% of its land in farms, enrolled in the CRP. South Dakota is an important producer of wheat, feed grains, soybeans, and forage crops - the most likely post-CRP[1] land uses. Thus, future CRP policy choices and land use decisions are important to this state. Several steps were used to estimate the farm-level impacts.

Agricultural Land Use, CRP Intensity and Ag Dependence by Region

Major regional differences in agricultural land use, CRP intensity, agricultural-dependence, and economic structure necessitated using regional models to

[1] The term **"post-CRP"** refers to future CRP policy options or future land use alternatives for CRP lands after **expiration** of **existing CRP contracts**. Regardless of future CRP policy options, CRP contract holders will have to make decisions concerning the use of their CRP lands when their existing contracts expire.

estimate economic impacts. South Dakota was divided into eight regions based on Ag Statistics regions, but combining the West Central and Southwest regions into one, West, region. Agricultural land use information for cropland, CRP, and pasture/rangeland were obtained from USDA-NASS, USDA-NRCS and U.S. Census of Agriculture data sources.

Nearly 59% of South Dakota's 2.06 million CRP cropland acres are located in three regions: Northwest, North Central and Northeast (Table 1).

The intensity of CRP acres (as a percent of total cropland acres) is well above the statewide average of 10.5% in the Northwest and North Central regions and considerably below the statewide average in the Central, East Central, and Southeast regions. The intensity of CRP acres (as a percent of land in farms) is much higher in the North Central and Northeast regions (Table 1).

Based on amount and intensity of CRP lands in each region, post-CRP policy changes are likely to have greater direct effects on potential land use changes in the Northwest, North Central, and Northeast regions. However, the economic impacts of CRP policy changes could be greater in other regions depending on the economic structure and ag dependence of the region and the CRP policy changes' effects on commodity prices and profits in each region.

Determining Relative Productivity Differences

The relative productivity of CRP cropland to all cropland in each South Dakota was estimated in each region by comparing the soil productivity ratings of major soil types on CRP tracts with the soil productivity ratings of the major soil types suitable for and generally used in crop production. The regional productivity ratings for CRP land and all cropland were weighted by the number of acres per major soil type (10).

Compared to all cropland, the relative productivity of average CRP cropland varies systematically across South Dakota. For example, the relative productivity of

CRP cropland to all cropland varies from 76% to 84% in the Central, North Central, Northeast, and East Central regions (Table 1). CRP lands in these regions are a mixture of HEL contracts and wetland contracts. In western South Dakota, the relative productivity of average CRP land is 97% to 103% of all cropland. CRP tracts in these regions were often enrolled under wind erosion criteria. The amount of wind erosion is caused more by the location of land and by farming practices on the land than by differences in
soil types.

The estimated yields for all cropland were set equal to the 10-year average (1985-1994) yields recorded by USDA-NASS in each region. The crop yields on CRP lands were estimated by multiplying the relative productivity ratios of CRP land by the estimated yields on all cropland in each region (10).

Land Use Net Returns for Post-CRP Policy Options

Three post-CRP policy options used in the national CRP modeling were used in the South Dakota research: no CRP, reduced CRP, and full CRP extension. Crop use returns were determined for each policy option. Net returns to land was used as the profit measure. The CARE software package developed by USDA - NRCS was used to develop cost and return budgets for each crop in each region. The regional crop budgets were developed using crop management practices for CRP land and all cropland recommended by district NRCS conservationists and the SDSU Cooperative Extension Service (6).

CARE budgets were developed for each crop in each region. Separate budgets were run for all crop land and CRP land. Yields determined in the previous step were used in each budget along with predicted South Dakota for the year 2000, the year when most existing CRP contracts have expired. South Dakota crop and forage prices were abstracted from national predicted prices using linear regression equations relating historical state and national commodity prices. Each budget was

run once for each policy option. In each run, predicted South Dakota prices for the appropriate policy option were substituted into the budgets. Predicted net returns to land were calculated for each crop/forage use for all cropland and CRP land in each region under each post-CRP policy scenario.

Net returns for recropping CRP land were compared to net returns from pasture / range uses and to projected average payment rates for new CRP contracts. Net returns for CRP pasture uses are based on an average value of $12 per AUM (Animal Unit Month) multiplied by the amount of forage AUM's produced per acre for forage use. Projected net returns to CRP pasture varied from $9-$10 per acre in western SD to $20-$21 per acre in eastern SD. Projected average bid rates for new CRP contracts in the full CRP and reduced CRP scenarios varied from $20-$25 per acre in western SD to nearly $50 per acre in eastern SD. The statewide average payment of $31.50 per new CRP acre is 23% lower than existing CRP contract rates averaging $41/acre (10).

Crop prices are projected to increase as more of the nation's cropland is retained in the CRP. For example, South Dakota crop prices are projected to increase 2% to 10% from the no CRP to the reduced CRP extension scenario. Further price increases from the reduced CRP to full CRP scenario are modest (+3% to +5%) for corn, grain sorghum, soybeans, and alfalfa and more substantial (>10%) for barley, oats, and wheat.

As expected, the profitability of each crop varied by region and post-CRP policy scenario. In general, soybeans, wheat, or alfalfa had the highest net returns per acre on average productivity CRP land in each region. Net returns for one or more of these crops on average quality CRP land were competitive with projected CRP payment rates in most regions. Net returns to corn were higher than net returns to CRP pasture in eastern regions but were usually lower than projected CRP payment rates. Oats and barley had negative net returns in most regions. Grazing

and forage uses on CRP land had the greatest profit potential (compared to crop uses) for lower yield CRP land in all regions and CRP-average land in western regions. Recropping CRP land (compared to grazing use) had the greatest profit potential for higher yielding CRP land in all regions and CRP-average land in eastern and central regions.

Total Net Returns to Ag Land by Region and CRP Policy Scenario

Total net returns are the sum of net returns to various crop, forage, and CRP land uses multiplied by the total number of acres in each agricultural land use. Total net returns to land in each region increased with more land enrolled in CRP due to: (1) the direct effect of CRP payments, and (2) the indirect effect of higher crop prices. Statewide, nearly 60% of the marginal increase in net returns ($30.9 of $53.8 million) from the no CRP to reduced CRP policy scenario was due to projected CRP payments. The remainder of the increase in net returns was due to higher crop prices and other impacts of land use changes. A similar pattern occurred as the policy scenario changed from reduced CRP to full CRP extension (Table 2).

The direct effect of CRP payments was strongest in the CRP-intensive regions of northern and western South Dakota. The indirect effect of projected higher crop prices was greatest in the less CRP intensive regions of central, east central, and southeast South Dakota.

The farm-level economic impact of more CRP acres as measured by net returns to land was positive in all regions. However, the impact of more CRP acres on agribusiness and other economic sectors in each region could only be obtained from a more comprehensive regional economic analysis.

REGIONAL ECONOMIC IMPACTS OF POST-CRP POLICY OPTIONS

The IMPLAN input/output model was employed to calculate the regional and state-wide economic impacts of the alternative post-CRP policy options. Separate IMPLAN models were created for each policy option. Each option had eight regional

models and one state model. The models were developed using future land use costs and net returns developed in the farm-level section of this research.

The most recent (1992) data set of South Dakota interindustry coefficients were used as the baseline for the IMPLAN analysis. Since the full enrollment of CRP acres occurred by the early 1990's, the full CRP extension scenario was set equal to the baseline data. Total costs per land use, per acre production costs estimated in the CARE budgets multiplied by the estimated number of acres in each land use, were calculated for each policy option. The cost differentials (changes in total land use costs from the full CRP scenario to the other CRP scenarios) were entered into the no CRP and reduced CRP policy models. The direct and indirect effects of moving from full CRP extension to no CRP extension or reduced CRP extension were then determined.

Total net returns plus CRP payments were calculated for each post-CRP policy option. Changes in net returns away from full CRP extension returns were measured for the no CRP and reduced CRP policy scenarios. These net return differentials were entered into the IMPLAN income analysis to compute the induced effects of shifting CRP policy from full CRP extension to reduced CRP or to no CRP extension.

Economic analyses of total value added impacts[2] are reported by CRP policy scenario for each model, along with a discussion of value added impacts for ag-related industries and non-ag industries. Total value added economic impacts consist of three types: direct impacts of the policy change, indirect impacts caused by increased spending from directly impacted industries, and induced effects from the changes in income under the different policy options.

[2] Four economic impact indicators were examined: industry output, property and worker income, value added, and employment. Results from each indicator were highly correlated with each other. Value added impacts are reported to conserve space and because they represent the net change in economic activity.

Economic Impact Results

The policy change from full CRP extension to no CRP had negative impacts on value added for South Dakota and for five regions: Northeast, Southeast, Central, East Central and West (Table 3). There was a $52.2 million loss in statewide total value added, a decrease of 0.4%. Percentage declines in value added were smallest (-0.1% to -0.2%) in the two regions, East Central and West, with the least economic dependence on ag production and with the largest urban population. These two regions contribute 55.5% of total value added in South Dakota and have only 18.5% of the state's CRP acres.

Value added declines ranging from -0.8% to -1.45% were projected in the more rural Northeast, Central, and Southeast regions. These regions have high ag dependence rates, but only the Northeast region is CRP-intensive.

The same policy change had positive impacts on value added in the North Central, South Central, and Northwest regions. These three regions are among the most rural, CRP-intensive, and agricultural dependent regions of South Dakota. These three regions have 54.5% of CRP acres and contribute only 13.8% of total value added in South Dakota (Tables 1 and 3).

The direct and indirect economic impacts on value added were positive statewide and in most regions. Increases in agricultural production and purchased input use from more acres in crop and forage production caused positive direct and indirect impacts. However, losses in CRP payments and reduced crop prices in the no CRP scenario caused producer net returns to decline in all regions. This decrease in net income caused negative induced income effects through decreased spending by households.

The policy change from full CRP to reduced CRP extension had similar, though relatively smaller, impacts on economic value added. In this policy scenario, there was a $35.7 million reduction in statewide total value added, a decrease of

0.27%. Value added percentage declines ranging from -0.11% to -0.96% occurred in seven of eight regions (Table 3). Positive value added impacts occurred only in the North Central region, which is the most CRP intensive region and has the greatest amount of projected land use changes.

The direct and indirect effects on value added were once again positive. The induced income effects of the policy change were negative. Statewide and in most regions, reduced producer income from less CRP payments and lower commodity prices outweighed the positive impacts of increased agricultural production resulting in negative change in value added.

CONCLUSIONS

The farm-sector economic impacts of proposed CRP policy changes are largely influenced by the interaction between and magnitude of changes in:
(1) agricultural land use; (2) agricultural production; (3) commodity prices and program payments; and (4) CRP payments. Total net returns to land, a measure of profitability, increased with more land enrolled in CRP due to: (1) the direct effect of CRP payments and (2) the indirect effect of higher crop prices.

The economic value added impacts of proposed CRP policy changes in each region were influenced by the combination of farm-sector economic impacts, CRP-intensity, agricultural dependence, and extent of farm - agribusiness linkages. Proposed policy changes to reduced (no) CRP acres had negative impacts on total economic value added, statewide and in most regions. In general, the positive direct and indirect economic impacts of increased agricultural production were outweighed by the negative induced income effects from lower net returns.

The actual policy changes in CRP and farm commodity programs passed in the 1996 FAIR Act and CRP rule changes implemented in March 1997 will likely reduce the magnitude of negative economic impacts in South Dakota.
The land use, commodity price, and economic impacts of actual CRP policy should

be closest to the revised CRP policy scenario presented in this study.

Table 1. South Dakota Ag Dependence, CRP Intensity and Productivity by Region

Region	Ag Depend. (%)*	CRP Acres (1000)	CRP Acres as Percent of: Cropland %	Land in Farms %	Productivity of CRP Land of All Cropland
Northwest	37.9	378	24.0	3.9	1.03
North Central	24.2	527	15.1	10.2	0.84
Northeast	29.0	311	11.5	8.7	0.81
West	6.8	246	11.9	2.4	0.97
Central	24.2	190	7.2	4.1	0.76
East Central	11.8	137	5.0	4.0	0.86
South Central	39.8	219	12.9	4.5	0.89
Southeast	27.2	54	2.0	1.7	0.95
SOUTH DAKOTA	17.2	2062	10.5	4.6	

Sources: USDA-NRCS, USDC-BEA

*Agricultural dependence is calculated as the total value added in all ag industries as a percent of total value added from all industries.

Table 2. Total Net Returns for the Crop, Forage and CRP Land Uses by South Dakota Region and CRP Policy Scenario

Region	CRP Policy Scenario		
	No CRP	Reduced CRP	Full CRP
	--total net returns to land (added CRP payment)-- millions of dollars		
Northwest	49.7	52.3 (4.3)	56.9 (8.6)
North Central	80.1	92.5 (8.4)	103.1 (16.6)
Northeast	101.0	109.1 (5.7)	121.7 (11.8)
West	56.1	60.1 (3.2)	64.3 (6.3)
Central	60.8	65.1 (1.7)	74.1 (6.8)
East Central	99.1	109.0 (3.4)	118.5 (6.7)
South Central	47.0	50.9 (3.2)	55.5 (6.4)
Southeast	94.8	103.3 (1.0)	114.1 (2.7)
SOUTH DAKOTA	588.6	642.4 (30.9)	708.2 (65.8)

Table 3. South Dakota Economic Activity (Total Value Added) Changes by CRP Scenario, State and Region

State / Region	CRP Policy Scenario: Baseline = Full CRP Total Value Added mil. $	No CRP: Change in Value Added mil. $	No CRP: Percent Change %	Reduced CRP: Change in Value Added mil. $	Reduced CRP: Percent Change %
Northwest	$ 356.5	+ $ 5.6	+1.59	- $ 1.0	-0.79
North Central	1096.6	+ 1.2	+0.11	+ 0.9	+0.07
Northeast	1239.0	- 18.0	-1.45	- 12.0	-0.96
West	3056.7	- 0.3	-0.10	- 0.1	-0.01
Central	948.0	- 10.3	-1.10	- 3.9	-0.44
East Central	4310.6	- 8.7	-0.20	- 4.7	-0.11
South Central	374.7	2.3	+0.59	- 0.6	-0.13
Southeast	1600.0	- 12.8	-0.8	- 8.0	-0.50
SOUTH DAKOTA	$13291.5	- $52.2	-0.40	- $35.7	-0.27