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Relative Profitability and Production Costs of Post-CRP Alternative Land Uses in South Dakota

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RELATIVE PROFITABILITY AND PRODUCTION COSTS OF POST-CRP ALTERNATIVE LAND USES IN SOUTH DAKOTA*

by

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

RELATIVE PROFITABILITY AND PRODUCTION COSTS OF POST-CRP ALTERNATIVE LAND USES IN SOUTH DAKOTA

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ABSTRACT

South Dakota (SD) has 2.06 million acres of CRP land with contracts expiring from 1996 - 2002. These CRP lands are 10.5% of cropland acres and 4.6% of land in farms in South Dakota. The major objective is to determine relative profitability of alternative crop and forage uses of post-contract CRP lands in different regions of South Dakota. Crop and forage per acre net returns were heavily influenced by relative productivity of CRP lands. The relative productivity of average CRP land compared to all cropland varies from 76% to 95% in eastern and central SD to 89% - 103% of all cropland in western SD. Within each region, CRP lands were subdivided into high, average, and low yield categories. Alfalfa and other forage uses were generally the most profitable uses of low-yield CRP land, while soybeans, wheat, corn, or alfalfa were the most profitable uses of average or high-yield CRP lands. Aggregate net returns to forage and cropland uses in SD were 9% to 20% greater if 50% to 100% of the amount of CRP acres were re-enrolled in new contracts. This information can be used to develop more specific post-CRP management plans by producers and to help assess economic impacts of potential land use changes.

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RELATIVE PROFITABILITY AND PRODUCTION COSTS OF POST-CRP ALTERNATIVE LAND USES IN SOUTH DAKOTA

INTRODUCTION

The Conservation Reserve Program (CRP) was created under the Conservation Title (Title XII) of the 1985 Food Security Act. CRP was enacted with the goal of removing highly erodible land and other environmentally sensitive land from crop production. Other goals of the CRP were to raise crop prices and control surplus production of crops that was occurring in the mid-1980's.

Twelve sign-up periods were scheduled from 1985 to 1992. 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 contract expiration will affect most of the 36.4 million acres of CRP land in the United States. In addition, commodity prices and production levels will be affected especially for wheat, corn, soybean and forage production. Also, regional economic impacts of post-CRP land use decisions will likely occur in agricultural-dependent regions with considerable amounts of CRP acres.

Land use intentions of CRP contract holders after contract expiration has been an important focus of socio-economic research and public attention in the 1990's. Several major research and public policy conferences (Denver, CO; Kansas City, MO; and Washington D.C.) were held in 1994 and 1995 to present current information on this subject. Results from national and state-level surveys of CRP contract holders indicate a majority of CRP land will likely return to crop production upon contract expiration (Joyce, Mitchell and Skold ed. 1991; Nowak et.al. 1991; SWCS, 1994; Dicks, 1994; Ghebremicael, 1994; Skaggs, Kirksey, and Harper, 1994).

Results from economic modeling studies sponsored by the North Central (NC-214) regional research committee on economic implications of expiring CRP contracts also indicates a majority of CRP acres will likely return to crop production (Ugarte et.al. 1996). Policy scenarios examined in the NC-214 study included: 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 policy option indicated 21.5 million of 36.4 million CRP acres are projected to shift to production of six farm program crops (wheat, corn, grain sorghum, oats, barley, and cotton) plus soybeans. Key land use results from the reduced CRP policy option indicated land use of nearly 13 million CRP acres are projected to shift to production of these seven crops.

Problem Identification - Potential Impacts of Post-CRP Land Use on South Dakota

South Dakota is an agricultural-dependent state and has an estimated 2.06 million acres, 10.5 percent of its cropland base, enrolled in the CRP. South Dakota is also an important producer of wheat, feed grains, soybeans, and forage crops - the most likely post-CRP[1] land use alternatives. Thus, future CRP policy choices and land use decisions are important to this state.

This report is focused on relative profitability of alternative agricultural uses of CRP lands in South Dakota when existing CRP contracts expire. A regional approach is emphasized because existing agricultural land use and potential post-CRP land use decisions varies greatly across the state.

The concentration of CRP acres in the northern regions, along with environmental and economic structure differences across South Dakota, suggests that alternative CRP policy options and land use decisions may have widely varied impacts in different regions of SD.

First, relative productivity differences between regions create different per acre net returns for each land use. Second, geographic and environmental differences between regions also impact the number of acres that go into each post-CRP land use. If CRP land is relatively unproductive for cropping, producers will be more likely to leave the land in grass or in CRP and will not require much incentive to do so. If the CRP land is productive for cropping, producers will be more likely to recrop it and future CRP policies will have to provide larger incentives to get the producer to keep the land in a conserving use.

Finally, productivity differences combine with economic structure to determine the impact of CRP policy options and land use decisions on the various regions. In some regions, such as the Northwest and South Central regions, the relative economic dependence on agriculture is very high, even for South Dakota. In these regions changes in post-CRP policies are more likely to have a larger impact on the total economy than in the more urbanized West and East Central regions where economic dependence on agriculture is much lower.

Research Objectives and Justification

The primary objective of this research project was determining the major economic impacts on South Dakota of alternative future CRP decisions. An important component of this

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[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.

research was estimating relative profitability and production costs of alternative uses of CRP lands in each region of South Dakota. This key component - estimating profitability and production costs of alternative agricultural uses of CRP land in each region of South Dakota - is emphasized in this report. Results from and methods used to estimate the major economic impacts on South Dakota of alternative CRP policy scenarios are presented in a companion report (Venhuizen, Beutler, and Janssen 1997).

Regional information on production costs and profitability of alternative agricultural uses of CRP land was used in this project to estimate post-CRP land use changes by substate region and to estimate changes in economic activity for agricultural industries directly impacted by post-CRP land use changes. This information can be used by CRP contract holders as a starting point in making CRP land use decisions upon contract expiration.

ESTIMATING RELATIVE PROFITS & PRODUCTION COSTS - METHODS & DATA SOURCES

Several steps were followed to estimate relative profitability and production costs of alternative agricultural uses of CRP land in South Dakota.

Agricultural Land Use and CRP Intensity by Region

South Dakota was divided into eight regions based on Agricultural Statistics regions, but combining the West Central and Southwest regions into one, West, region. Agricultural land use data, number of acres by type of crop, and extent of pasture / rangeland acres were obtained from the 1992 U.S. Census of Agriculture and from USDA - NASS data sources. The number of CRP acres in each region was obtained from USDA - NRCS data sources.

Nearly 59% of South Dakota's 2.06 million CRP cropland acres are located in three regions: North Central, Northwest and Northeast (Figure 1). Most CRP tracts in western SD regions were admitted under HEL (highly erodible land) wind erosion criteria. In eastern SD regions, CRP tracts were admitted under HEL erosion or cropped wetlands criteria.

Nearly 10.5% of South Dakota's 19.6 million cropland acres are enrolled in the CRP. The intensity of CRP acres (as a percent of total cropland acres) is well above the statewide average in the Northwest and North Central regions, and considerably below the statewide average in the East Central, Southeast and Central regions. The percent of cropland acres enrolled in CRP varied from 11.5% to 12.9% in the other regions (Figure 2).

However only 4.6% of South Dakota's 44.8 million acres of land in farms was enrolled in CRP. The intensity of CRP acres (as a percent of total land in farms) is much higher in the North Central and Northeast regions than in other regions of SD (Figure 2).

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 North Central, Northeast, and Northwest regions. However, the economic impacts of CRP policy changes could be greater in other regions depending on the economic structure of the region and the aggregate impacts of changing CRP policies on prices and profitability of various crop / livestock enterprises in the region.

Linkage of SD Research to National CRP Modeling

National CRP policy modeling has been conducted using macroeconomic simulation models (FAPRI) for agriculture combined with an interregional agricultural policy simulation model (POLYSIS). This modeling approach measures only direct agricultural impacts. It was used to estimate national, state, and sub-state regional changes in cropland use and post-CRP land use for different economic policy scenarios. The national CRP modeling was sponsored by the NC-214 regional research committee on CRP and undertaken by the Agricultural Policy Analysis Center (APAC) of the University of Tennessee. The main purpose of the national CRP modeling project was to examine selected farm sector economic impacts of alternative post-CRP policy options. Three major post-CRP policy simulations were examined: (1) terminating the CRP when existing contracts expire, (2) continuing a reduced CRP of 18 - 20 million acres with possible targeting options, (3) retaining a full CRP at the 32+ million acre level.

The South Dakota research has several linkages to the national CRP model project. First, South Dakota data on relative 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, the selection of post-CRP policy options to examine for South Dakota was based on the policy options included in the national CRP models. Finally, 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.

Determining Relative Productivity Differences

The relative productivity of CRP cropland to all cropland in each South Dakota was not available in existing databases. Consequently, two or three representative counties were chosen in each region to estimate relative soil productivity differences (Figure 3). In each region, the goal was to represent all major soil types suitable for producing crops while using data from counties with the highest CRP acreage (Venhuizen, 1996).

The first step in calculating the relative productivity differences between all cropland and CRP land was to find the productivity of soil series suitable for cropping in each region.

County Soil Survey Books were used to determine the soil types that represent at least 75% of the soil acres in each representative county that are generally suited for crops (LCC 1-4). Weighted yields for the crops in each representative county were found based on NRCS yields and the weighted number of acres per soil type.

The second step was to measure the productivity of South Dakota CRP soils. NRCS conservationists provided a list of the major soil types located on CRP tracts enrolled in each representative county. Data in the county Soil Survey Books provided the individual crop yields and number of acres in each county for the CRP soil types. Weighted yield averages were computed for all crop land, CRP average yield land, CRP high yield land, and CRP low yield land, where the high and low yields represent the upper and lower quartiles of CRP yields. These yields were then used to determine the relative productivity ratios between all crop land and the three classes of CRP land.

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 (Figure 3). 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% which is similar to the productivity of all cropland. CRP land in these regions were often enrolled due to 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. Within each region there is considerable variation in the relative productivity of "higher yield" CRP land to "lower yield" CRP land.

Finally, the productivity ratios displayed in Figure 3 are the average of productivity ratios of CRP land to all cropland for individual crops - corn, grain sorghum, oats, barley, spring wheat, winter wheat, soybeans, and alfalfa. There is relatively little variation in productivity ratios by crop for the three classes (average, high, and low yield) of CRP land in each region.

The estimated yield for all cropland was set equal to the 10-year average (1985-1994) yield recorded by USDA-NASS in each region. The crop yields on CRP lands were estimated by applying the average crop yield differentials (productivity ratios) for different types of CRP land in each region to the 10-year average yield for each specific crop. A summary of long-term average crop yields for all cropland and CRP land are available in Venhuizen, 1996.

Land Use Net Returns for Post-CRP Policy Options

Three post-CRP policy options used in the national CRP modeling were focused on 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 budgets used conventional or reduced tillage crop management practices recommended in each region by the SDSU Cooperative Extension Service (Peterson, 1996). After CRP land is returned to crop production, the crop management practices are assumed to be the same as those on surrounding cropland. The main exception is that CRP wheat lands in western SD are assumed to use mechanical / chemical fallow instead of mechanical fallow or the cropland cannot meet conservation compliance.[2]

CARE budgets were developed for each crop in each region. Separate budgets were run for all crop land, CRP average yield land, CRP high yield land, and CRP low yield land for each crop in each region. Yields determined in the previous step were used in each budget along with predicted South Dakota prices for the year 2000. In the year 2000 most CRP contracts in South Dakota will have ended. South Dakota crop prices were abstracted from the national FAPRI predicted prices using linear regression equations relating historical state and national crop prices (Tables 1 & 2). Each budget was run once for each policy option. In each run, the predicted South Dakota prices for the appropriate policy option were substituted into the budgets. Predicted net returns to land, including and excluding farm program payments, were calculated for each crop in each region under each post-CRP policy scenario.

After estimating crop use net returns, the profitability of forage alternatives was found. Gross forage returns for range, pasture, and wild hay were based on their AUM (Animal Unit Month) returns. AUM returns for the year 2000 were predicted using a regression function based on AUM returns and cattle prices. The linear regression function was applied to FAPRI's estimated cattle prices for the year 2000 to find the expected return of $12 per AUM for all three policy scenarios. Gross forage returns for alfalfa hay were based on tons per acre

[2] Production / tillage practices used to estimated production costs on CRP lands were based on consultation with Dr. Don Peterson, SDSU Professor of Economics and Extension Economist, and with USDA - NRCS state / district conservationists in each region.

and the estimated South Dakota alfalfa prices multiplied by expected ton per acre yield. A regression function relating South Dakota and national prices was also estimated for alfalfa (Table 2). Net returns for the forage alternatives were calculated by subtracting the appropriate establishment, pre-harvest, and harvesting costs from the gross returns for each post-CRP policy scenario. Expected forage prices and returns per AUM are shown in Table 1.

Crop prices are projected to increase as more of the nation's cropland is retained in the CRP (Table 1). For example, crop prices in South Dakota are projected to increase 5% to 10% from the no CRP extension to the reduced CRP extension scenario. Further price increases from the reduced CRP to full CRP scenario are modest (+3% to +5%) for corn, sorghum, soybeans, and alfalfa and substantial (+10% to +11%) for barley and oats. Projected wheat price increases exceed 20% from the reduced CRP to full CRP extension scenario due to extremely low wheat stocks projected in the full CRP scenario.

For each farm program crop, projected net returns are calculated with and without the impact of government payments. The government payments included in the reported budget results are deficiency payments based on application of 1990 farm program rules instead of the market transition payments incorporated in the 1996 farm legislation.[3] The major differences between these two government payment concepts are: (1) market transition payment amounts are fixed each year, regardless of market price levels, while deficiency payments decrease (increase) as market prices increase (decrease), and (2) market transition payments are independent of current crops planted.

Overall, crop net return projections in each region are varied over a wide range of net prices and yields. However, readers interested in assessment of potential crop choices on CRP land should only use these results as a "rough guideline".[4]

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[3] The post-CRP policy scenarios used in this project were developed by the NC-214 committee as research input to CRP policy formation in the 1996 farm bill. Then current (1995) commodity policy RULES were used in each CRP policy scenario as the variables of interest in this study were changes in CRP policy, not changes in farm commodity program rules.

[4] In the authors' opinion, the reduced CRP policy scenario is the closest approximation of the actual CRP policy adopted in the 1996 farm bill. The market transition payments for corn, wheat, corn, and grain sorghum are nearly $0.20/bushel lower, while barley and oats transition payments are $0.10 to $0.12 lower than the deficiency payments assumed for the reduced CRP scenario.

RELATIVE PROFITABILITY OF AGRICULTURAL LAND USES - RESULTS & DISCUSSION

The CARE budgets produced a return, or profitability, per acre for each of the seven crop alternatives examined. Both net returns and gross returns were estimated. For crops eligible for farm program payments (wheat, corn, grain sorghum, oats, and barley), both a market net return and a program net return were estimated. Gross and net return information for selected crops on average CRP land in each region for the reduced CRP alternative are shown in Table 3.[5] The net return results from this CRP policy alternative are mid-range among the three policy scenarios. Furthermore, this CRP policy scenario is the closest approximation of the actual CRP policy in the 1996 farm bill. The complete listing of cost and returns for all crops in each region for all three alternative CRP policy scenarios are available in Venhuizen, 1996.

Net returns per acre for each crop alternative on CRP land can be compared to at least three different opportunity costs. First, which crops have positive net returns to land? In most cases, this is the only set of cropping choices that will be considered. Second, which crops have projected net returns that exceed net returns from grassland or pasture? CRP land is currently in grassland and projected crop returns will need to exceed grassland returns or many producers will not switch to cropping. Third, which crops have projected net returns that exceed potential CRP payment rates for tracts that remain eligible for new CRP contracts? Many existing CRP tracts may be eligible for a new CRP contract.[6] In these cases, crop net return projections need to compete with or exceed the projected average CRP bid rates shown in Figure 4. For average quality CRP land in each region, the

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[5] Net returns to CRP pasture uses are based on an average value of $12 per AUM. The projected per acre net returns are equal to net returns per AUM ($12) multiplied by the amount of AUM's of forage produced per acre for livestock use. The projected per acre net returns to CRP pasture by region are: Northwest = $9.94, North Central = $16.07, Northeast = $20.40, West = $10, Central = $16.93, East Central = $20.06, South Central = $15.77, and Southeast = $20.11.

[6] CRP provisions in the 1996 farm bill indicate that expiring CRP contracts cannot be renewed, but can be rebid as a new CRP contract. New CRP bid rates are capped at average cropland rental rates, adjusted for soil productivity, in the locality. Eligibility criteria has expanded to include erosion, water quality / wetlands, wildlife, and related environmental criteria. The likely consequences of these CRP provisions for South Dakota are: (1) many existing CRP contracts may not be eligible to rebid into the new CRP program, and (2) average bid rates on new CRP contracts will usually be lower than existing CRP payment rates in central and western SD.

range of net returns per crop across post-CRP policy scenarios are compared to projected CRP bid rates and net returns to pasture. (Figure 5).

As expected, the profitability of each crop varies from region to region. Spring wheat, winter wheat have positive net returns to land on all types of CRP land in each region. Alfalfa has positive net returns on average and high yield CRP land in all regions of South Dakota. Corn and grain sorghum have positive net program returns in central and eastern South Dakota on all but the lowest soil productivity types. In eastern SD corn has positive net market returns on average and productivity CRP land. Oats and barley have negative net market returns in most regions. Barley has positive net market and net program returns in the Northeast region, while oats has positive net program returns on the best CRP soils in the Northeast and East Central regions.

In the Northwest and West regions, winter wheat and spring wheat are usually profitable on all three types of CRP land. Spring wheat has positive net program returns on all CRP land, but negative net market returns on lower yield CRP land. Alfalfa has positive net market returns on average and higher yield CRP lands. Most other crops have negative net returns projected regardless of CRP land productivity or farm program base history. The average expected CRP payment is $22.81 per acre in the Northwest region and $25.79 in the West region. Winter wheat and alfalfa produced on average or higher yield CRP lands are the only cropping choices that are competitive with the CRP payment rate. Projected net returns for spring wheat, winter wheat and alfalfa on average or higher yield CRP land meet or exceed net returns to grassland uses.

Wheat, soybeans, alfalfa and corn are the most profitable crops on CRP land in the North Central region. Barley has positive net returns only on higher productivity CRP lands and oats is unprofitable on any CRP land class. The expected average CRP payment is $31.58 per acre, while net returns to pasture are projected to be $16 per acre. Only higher productivity CRP land planted to wheat or soybeans or average CRP land planted to alfalfa is competitive with the CRP payment rate. Wheat, soybeans and alfalfa planted on average quality CRP land have higher projected net returns than grassland uses.

In the Northeast region, Net returns per crop in the Northeast region are greater than in the North Central or western region. Most crops have positive net returns on all but the poorest CRP land, but these net returns are lower than pasture net returns. Soybeans, wheat, or alfalfa raised on average or higher yield CRP lands often have projected net returns competitive with the expected average CRP payment of $37.84 per acre. Corn

raised on higher productivity CRP land has net market or program returns competitive with projected CRP payment rates.

Winter wheat, spring wheat, and soybeans have positive net returns on all but low yield CRP land in the Central region. Alfalfa is also profitable, while oats is generally unprofitable. Corn and grain sorghum are profitable on high yield CRP base acres. Winter wheat is the most profitable row crop on low yield and average yield CRP acres, while soybeans is most profitable row crop on high yield CRP acres. Alfalfa is the only crop raised on average quality CRP land with projected net returns that exceeds the projected CRP payment of $36 per acre. Wheat, soybeans, grain sorghum, and alfalfa raised on higher yield CRP lands have competitive net returns with CRP bid rates.

Sorghum, winter wheat, soybeans, and alfalfa are the most profitable crops in the South Central region. Net returns to soybeans, winter wheat and alfalfa raised on average quality CRP land are competitive with the projected average CRP payment of $29.06/acre and exceed net returns to pasture. These same crops and sorghum raised on high yield CRP land have greater net returns than the CRP bid rate.

Most crops in the East Central and Southeast region have positive net returns. In both regions the net returns to wheat, soybeans, and alfalfa exceed net returns to pasture on average CRP land and are fairly close to CRP bid rates averaging $49 per acre. On high yield CRP land, net returns from soybeans, corn, sorghum and winter wheat are usually greater than the CRP bid rate. Low yield CRP land generally has the highest net returns in pasture or rebid into CRP.

TOTAL NET RETURNS TO AGRICULTURAL LAND BY REGION & 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 increased, statewide and in every region, as more of U.S. and South Dakota cropland was retained in CRP (Table 4). This key result occurs from two effects: (1) the direct effect of CRP payments, and (2) the indirect effect of higher crop prices and net returns when more land is retained in CRP. For example, total net returns to land increased $53.8 million ($642.4 mil. - $588.7 mil.) from the no CRP extension to the reduced CRP extension scenario. Nearly 60% of the marginal increase in net returns ($30.9 of $53.8 million) is due to projected CRP payments on 1,020,000 acres. The remainder of the increase in net returns is due to higher crop prices and net returns. A similar pattern occurs

as the policy scenario changes from reduced CRP to full CRP extension. CRP payments nearly doubled statewide ($65.8 million vs. $30.9 million) and in each as the post-CRP policy scenario changed from reduced CRP to full CRP extension.

Net return to land increases in the more CRP intensive regions (Northwest, North Central, Northeast, West and South Central) are mostly due to the direct effect of CRP payments. Net return to land increases in the least CRP intensive regions (Southeast, East Central, and Central regions) are largely due to increased crop prices and net returns, as relatively low amounts of cropland are enrolled in CRP.

Thus, in every region the total impact of more CRP acres as measured by net returns to land is positive. However, the impact of more CRP acres on agribusiness and other economic sectors in each region is not shown. A more comprehensive regional economic impact analysis is presented in a companion report (Venhuizen, Beutler and Janssen 1997) and Master's thesis (Venhuizen, 1996).

SUMMARY AND CONCLUSIONS

This report focused on relative profitability of alternative agricultural uses of CRP lands in South Dakota when existing contracts expire. Gross returns, production costs, and net returns were estimated for three CRP policy scenarios that included a range of likely prices. Net returns to land was used as the profit measure and estimated for all cropland, and CRP-average, CRP-high, and CRP-low yield cropland for major crops in each agricultural region of South Dakota. Net returns to crop uses projected were compared to projected net returns to pasture use and to potential CRP payment rates for new contracts.

The major findings are:

(1) The relative productivity of CRP lands to all cropland in central / eastern regions are lower (0.76 - 0.84) than in western regions of South Dakota (0.89 - 1.03). CRP lands in eastern SD were enrolled under HEL or cropped wetlands eligibility criteria, while wind erosion was an important criteria in western South Dakota.

(2) Soybeans, wheat, or alfalfa have the highest net return potential per acres on CRP - average land in each region. Net returns for one or more of these crops on average quality CRP land are competitive with potential CRP payment rates in most regions. Grazing / forage uses on CRP land have the greatest profit potential (compared to crop uses) for CRP-low yield land in all regions and CRP-average land in western regions. Recropping CRP land (compared to grazing use) has the greatest profit potential for CRP - high yield land in all regions and CRP-average land in most regions.

(3) Total net returns to land in each region increased with more land enrolled in CRP due to direct effect of CRP payments and the indirect effect of higher crop prices. The direct effect of CRP payments was strongest in the CRP-intensive regions of northern and western South Dakota, while the indirect effect of projected higher crop prices was greatest in the less CRP intensive regions (Southeast, Central, and East Central regions).

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Table 1. South Dakota Crop / Forage Prices and Deficiency Payment Assumptions

Crop/Forage Prices	No CRP Extension	Reduced CRP Ext.	Full CRP Extension
CROP PRICES			
Corn	$1.92 ($0.66)	$2.04 ($0.53)	$2.09 ($0.48)
Sorghum	$1.67 ($0.70)	$1.77 ($0.59)	$1.83 ($0.52)
Oats	$1.19 ($0.20)	$1.27 ($0.12)	$1.40 ($0.00)
Barley	$1.66 ($0.45)	$1.80 ($0.32)	$2.01 ($0.12)
Sp. Wheat	$3.10 ($1.06)	$3.38 ($0.79)	$4.08 ($0.11)
Wt. Wheat	$2.84 ($1.06)	$3.16 ($0.79)	$3.98 ($0.11)
Soybeans	$5.24	$5.41	$5.65
FORAGE PRICES			
Range	$12/AUM	$12/AUM	$12/AUM
Pasture	$12/AUM	$12/AUM	$12/AUM
Wild Hay	$12/AUM	$12/AUM	$12/AUM
Alfalfa	$50.19/ton	$52.85/ton	$55.50/ton

Note: Deficiency payments are listed in parentheses for the appropriate crops.
All prices are per bushel unless otherwise stated.

Table 2. Relationship of South Dakota Crop Prices to National Crop Prices

South Dakota Crop Price	Relationship to National Crop Price	
Corn	-0.109 + 0.971 N	R^2 = 0.926
Grain Sorghum	-0.119 + 0.934 N	R^2 = 0.842
Oats	-0.087 + 1.021 N	R^2 = 0.961
Barley	-0.387 + 1.073 N	R^2 = 0.921
Spring Wheat	+0.075 + 1.028 N-All Wheat	R^2 = 0.886
Winter Wheat	-0.671 + 1.195 N-All Wheat	R^2 = 0.899
Soybeans	-0.323 + 1.008 N	R^2 = 0.983
Alfalfa	0.0 + 0.755 N-All Hay	R^2 = 0.610

Where N = National average crop price
All regression equations except alfalfa are based on crop price relationship from 1973 - 1992. The alfalfa price regression does not include data from 1981 or 1983.

Source: Venhuizen, 1996. Data are available from SDASS, various years.

Table 3. Gross Returns and Net Returns to CRP Land by Region

Northwest	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	72.22	84.09	-35.24	-23.96
Sorghum	47.08	58.62	-20.30	-9.34
Oats	52.83	56.71	-18.90	-15.22
Barley	59.40	67.29	-9.54	-2.05
S Wheat	70.64	81.15	3.71	10.21
W Wheat	91.01	101.51	15.59	21.25
Alfalfa	69.23		21.19	

North Central	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	115.06	131.01	-9.69	5.47
Sorghum	61.60	79.15	-15.96	0.72
Oats	51.82	55.90	-16.40	-12.52
Barley	61.56	70.81	-10.42	-1.63
S Wheat	73.35	83.85	11.12	19.33
W Wheat	82.16	92.67	14.58	21.43
Soybean	115.23		18.20	
Alfalfa	109.40		42.66	

Northeast	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	118.52	138.93	0.25	19.63
Sorghum	63.19	82.75	-6.70	11.88
Oats	60.58	65.78	-8.81	-3.87
Barley	67.14	78.02	0.79	11.13
S Wheat	83.15	96.42	20.69	32.03
W Wheat	84.06	97.33	21.17	30.93
Soybean	114.15		35.47	
Alfalfa	140.58		52.87	

Table 3 continued

West	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	77.11	90.47	-33.87	-21.18
Sorghum	50.98	66.52	-23.86	-9.09
Oats	43.82	47.38	-23.00	-19.61
Barley	50.04	57.66	-14.36	-7.12
S Wheat	64.90	78.72	0.39	8.68
W Wheat	95.75	109.57	15.50	22.40
Alfalfa	63.42		17.73	

Central	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	89.35	105.68	-27.06	-11.55
Sorghum	63.90	82.95	-12.89	5.21
Oats	44.32	48.51	-20.84	-16.87
Barley	51.30	60.28	-17.01	-8.49
S Wheat	58.47	70.09	2.47	11.82
W Wheat	75.52	87.14	12.63	19.93
Soybean	103.87		8.14	
Alfalfa	113.10		44.54	

East Central	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	142.80	165.43	-2.14	19.36
Sorghum	84.08	106.14	-0.40	20.56
Oats	57.40	62.50	-14.56	-9.71
Barley	65.70	76.85	-10.54	0.05
S Wheat	79.09	92.92	14.83	26.76
W Wheat	92.27	106.10	25.89	36.13
Soybean	137.96		35.97	
Alfalfa	148.51		57.17	

Table 3 continued

South Central	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	86.90	103.23	-32.17	-16.66
Sorghum	64.61	85.67	-12.63	7.38
Oats	48.13	51.91	-20.46	-16.87
Barley	52.74	60.90	-12.62	-4.87
S Wheat	69.63	84.59	4.84	15.40
W Wheat	89.43	104.36	14.59	22.51
Soybean	127.14		28.13	
Alfalfa	93.28		33.42	

Southeast	Gr Mkt Rtn	Gr Pgm Rtn	Net Mkt Rtn	Net Pgm Rtn
Corn	147.29	175.85	-6.35	20.79
Sorghum	104.61	133.69	10.58	38.22
Oats	59.82	65.12	-15.19	-10.15
Barley	70.20	81.08	-9.86	0.47
S Wheat	84.84	99.77	16.50	29.25
W Wheat	111.55	126.48	36.55	47.63
Soybean	158.51		53.55	
Alfalfa	163.31		65.97	

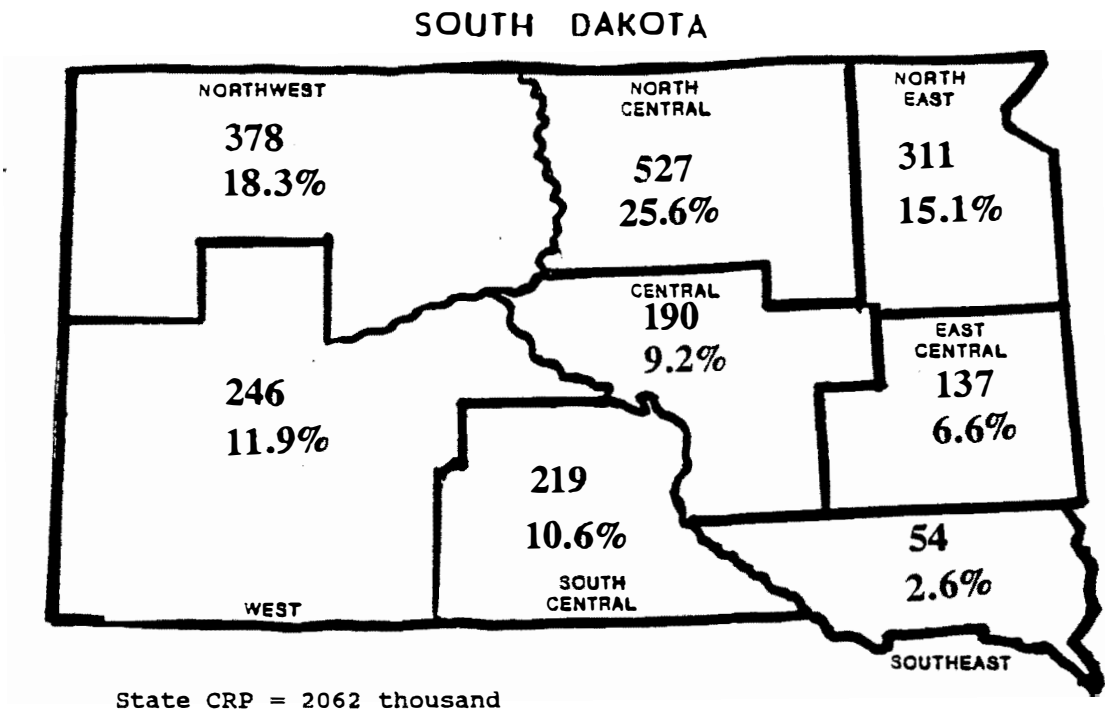
Source: Venhuizen, 1996.

Table 4. Total Net Returns for the Crop, Forage and CRP Land Uses by 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 dollar					
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)	

Source: Venhuizen, 1996

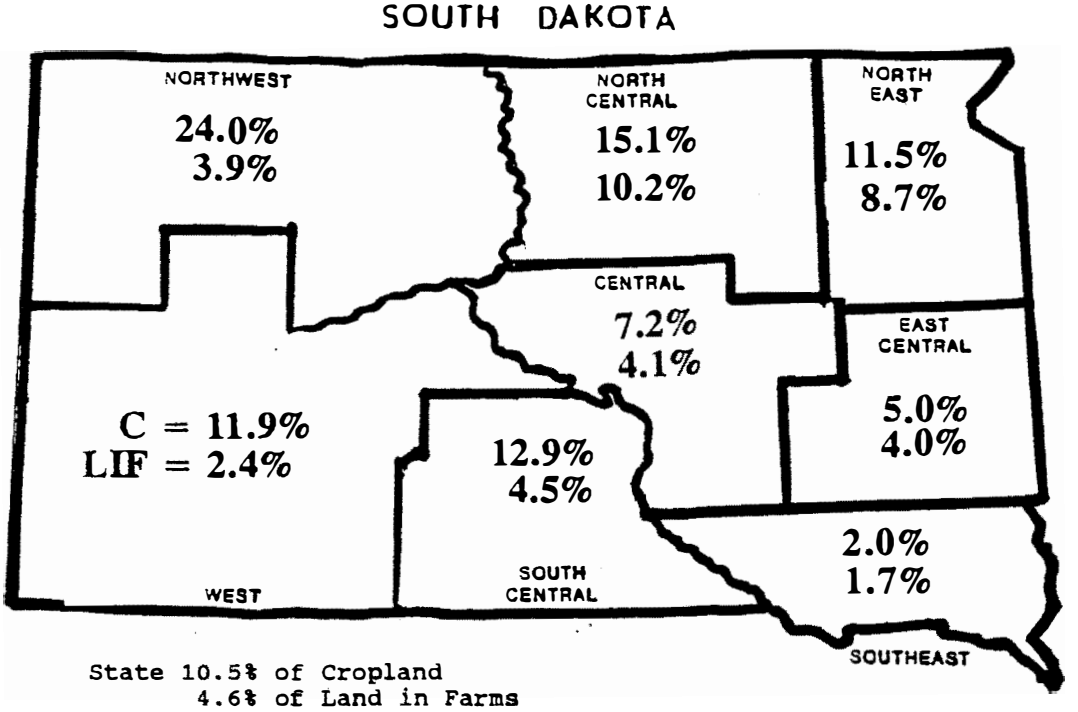
Figure 1. Number and Percent of CRP Acres



State CRP = 2062 thousand

Source: USDA-NRCS

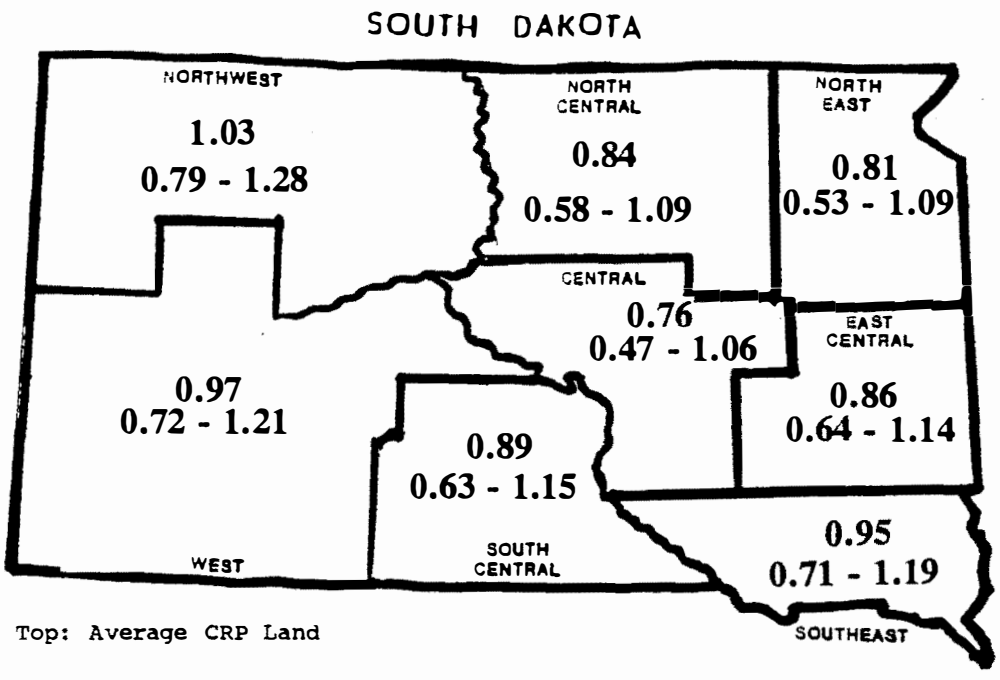
Figure 2. CRP Acres as Pct. of Cropland and Land in Farms



State 10.5% of Cropland
4.6% of Land in Farms

Source: USDA & Ag Census

Figure 3. Productivity Ratio of CRP Land to ALL Cropland

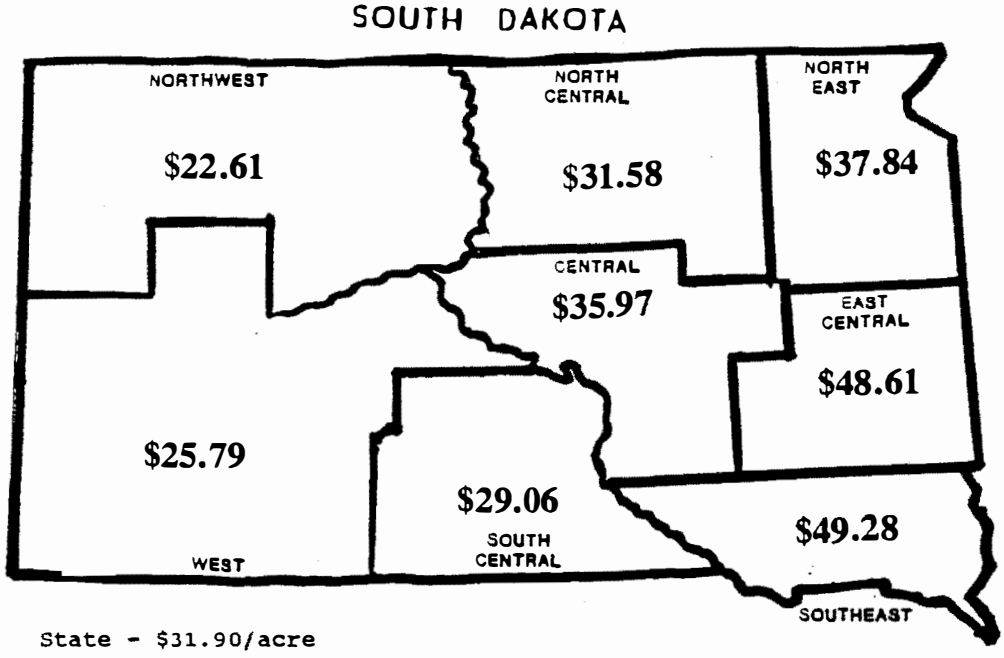


Top: Average CRP Land

Bottom: Low - High Prod. CRP Land

Source: Venhuizen, 1996

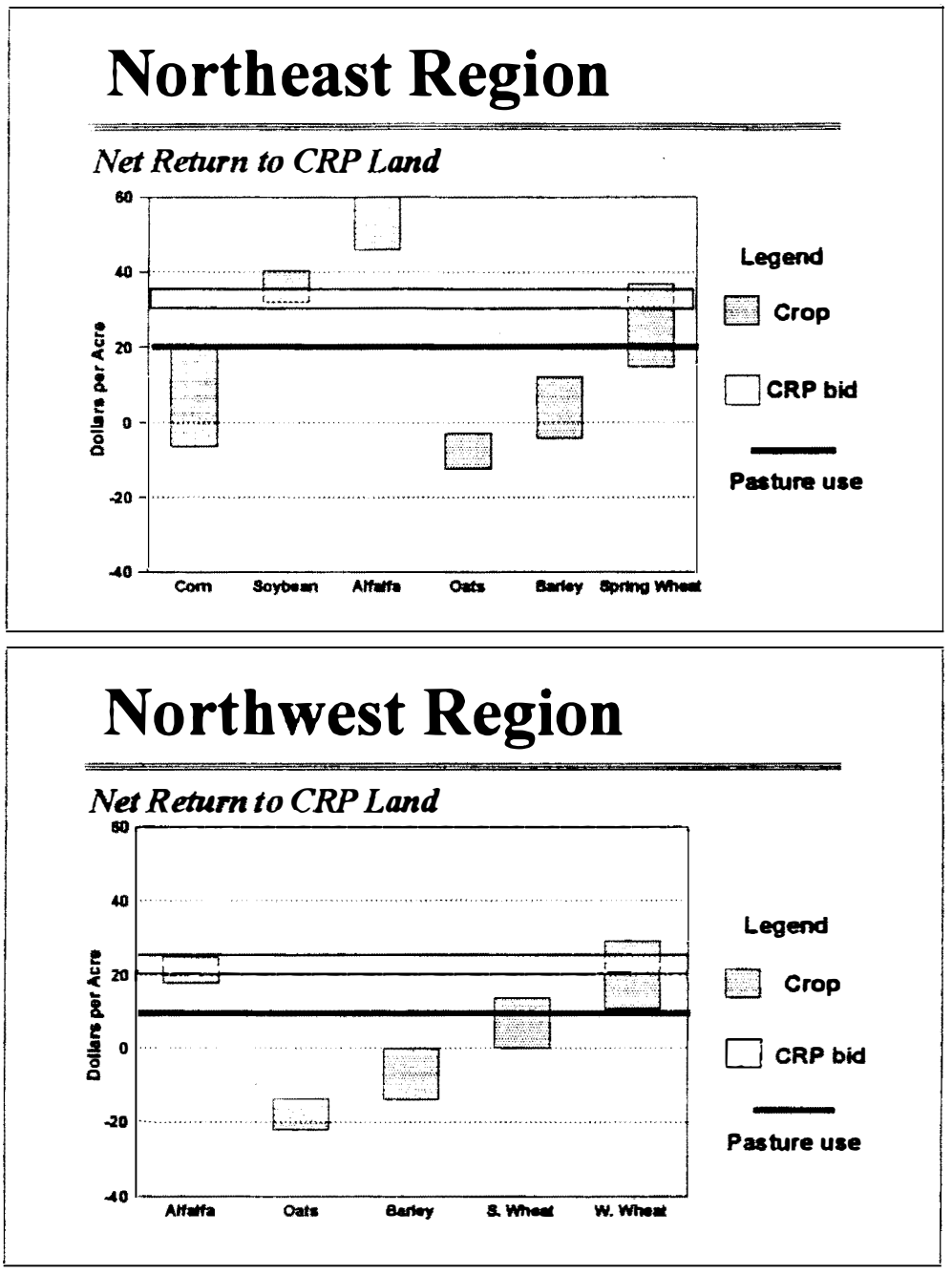
Figure 4. Average Payment Rate on New CRP Contracts



State - $31.90/acre

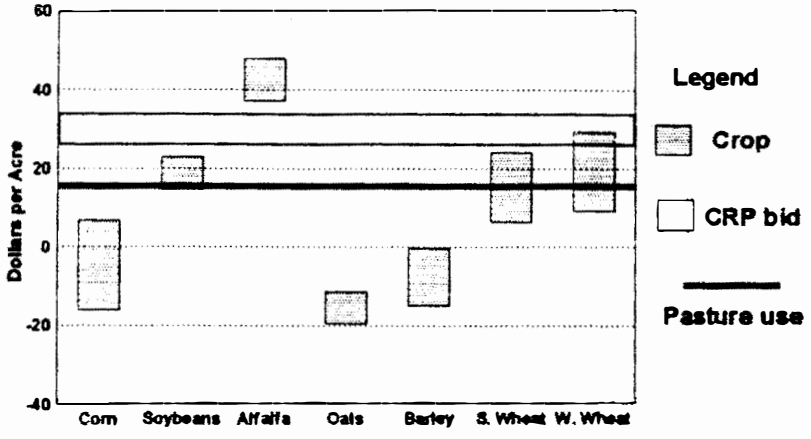
Source: Venhuizen, 1996

Figure 5. Net Returns to CRP Land - Major Crops by Region



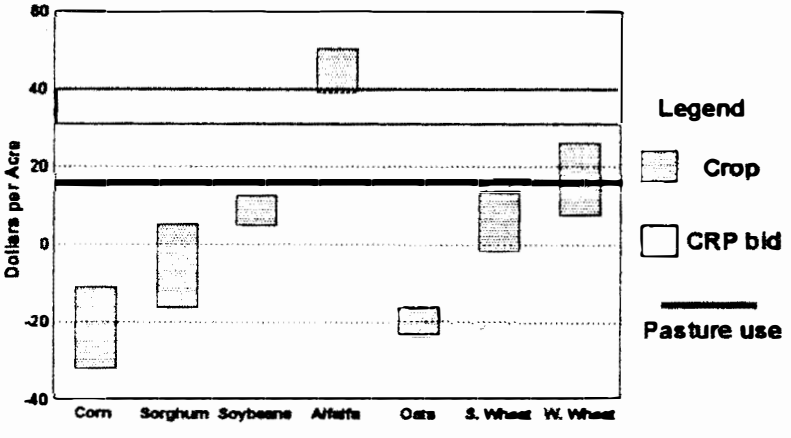
North Central Region

Net Return to CRP Land



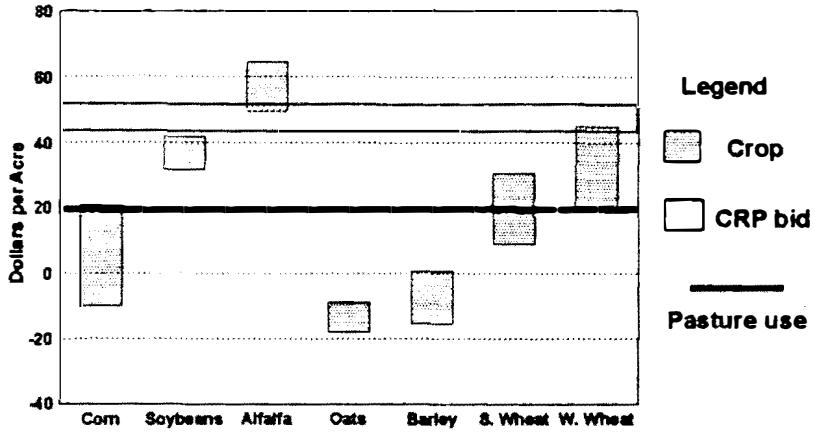
Central Region

Net Return to CRP Land



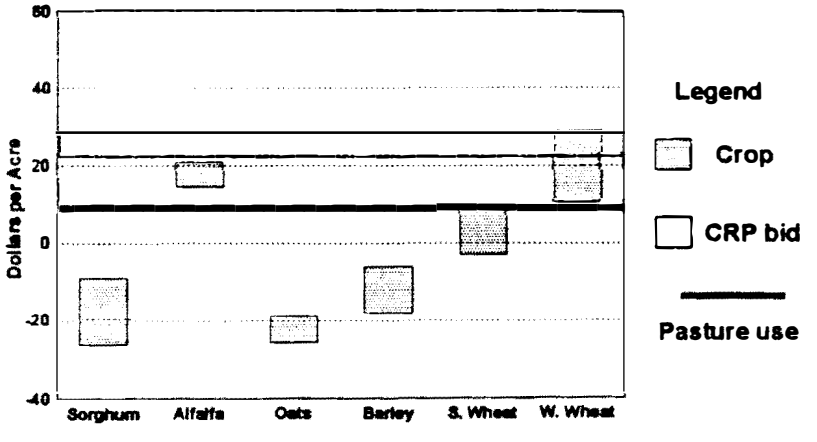
East Central Region

Net Return to CRP Land



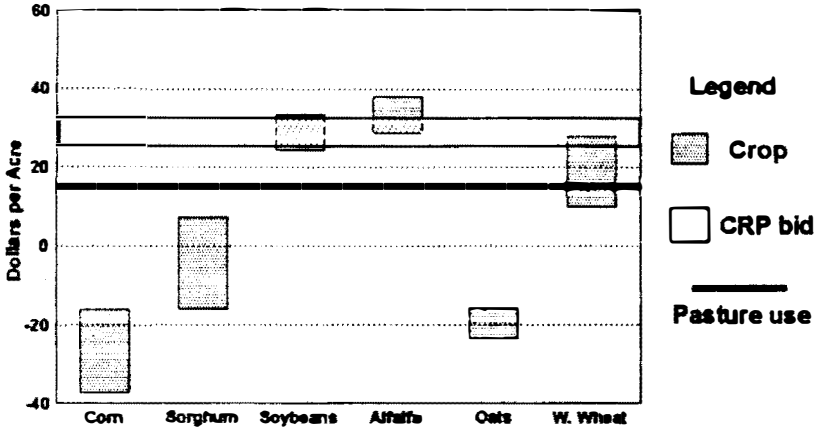
West Region

Net Return to CRP Land



South Central Region

Net Return to CRP Land



Southeast Region

Net Return to CRP Land